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COAL AGE

With Which is Consolidated The Colliery Engineer

DEVOTED TO COAL MINING AND COAL MERCHANDISING

EXTRACTION METHODS, EQUIPMENT AND MINING NEWS
MARKET REPORTS, PRICES AND STATISTICS
OF THE COAL INDUSTRY

ISSUED WEEKLY

VOLUME XXI

January 1 to June 30, 1922

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The Colliery Engineer

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Analyzing the Economics of the Coal Industry

ANNOUNCEMENT by Secretary Hoover on Dec. 19 that with funds supplied from private sources the President's conference on unemployment is to undertake a comprehensive study of intermittence of employment in the bituminous coal industry is gratifying news. The subject is large, as is indicated by the outline of the field to be covered by the inquiry. No more able, disinterested and at the same time friendly agency for this work could be suggested than the men who with E. E. Hunt are working with Mr. Hoover.

Friends of the coal industry despair at times at the magnitude of the task of both formulating the problems of coal and getting the story before the public in adequate and satisfactory manner. Two years ago the American Institute of Mining Engineers made a study and published a comprehensive study of the irregularity of operations of the bituminous coal industry. The fact was established but the document stands as an engineering report on which the board of directors have not acted. The problem is too complicated for solution by panacea.

Following the engineers' report were the investigations of Senator Frelinghuysen. These in 1919 were not only enlightening but decidedly helpful, but the history of 1920 indicates that the Senator not only failed to convince his colleagues on the real situation but fell short in his own education as well. The hearings conducted by Senators Calder and LaFollette were without fruit because conceived in distrust and outright ill-temper. They served only to inflame the public, without truly informing.

The Survey of Waste in Industry by the American Engineering Council of the Federated Engineering Societies planned to include coal in its program, but the subject was dropped from the list in the final report. The President's conference on unemployment failed to bring forth an agreement on coal.

Now, without rush or furor, with funds to do the job thoroughly, the permanent committee retained by Mr. Hoover to carry to fruition his plans for the betterment of conditions of employment in industry is to study coal. The outline of what this committee will examine reads like the synopsis of a treatise on the economics of the coal industry. Such a monograph has never been written; there is real need for it. Every opportunity should be offered, every facility advanced, every bit of information and guidance proffered by the men in the coal industry to forward the early but unhurried completion of this report.

A not to be overlooked point is the power of Mr. Hoover's name in eventually obtaining wide and favorable publicity for the finding and conclusions of Mr. Hunt and his colleagues. The objects of the original unemployment conference were attained—fair presentation of facts honestly arrived at—by the sheer power of publicity. The forthcoming report on the coal industry we hope, and have every reason to believe, will likewise succeed.

Whistling to Keep Up Courage

MINERS in the anthracite region are enjoying a hard-earned vacation. Save for a very short period early in 1919, when the post-armistice slump in demand closed many mines, and for about six weeks in the summer of 1920, when the miners went on strike, the hard-coal region has worked to capacity without interruption since 1916, or for five years. In round numbers 30,000 of the 145,000 anthracite miners and mine laborers are now idle all or part time. One after another the collieries have been suspending for the past four weeks, as demand for coal has diminished.

Press reports are to the effect that union labor leaders in the region have announced that the operators are closing the mines as a measure to coerce the men into recession from their announced position of having decided to demand a 20-per cent advance in wages next April, when the present contract expires. The assertion is equally absurd and on a par with the union leaders' demand for such or any increase in wages. The operators have already bought and paid for the labor to produce some 5,000,000 or 6,000,000 tons of anthracite valued at $40,000,000 which they are holding in producers' storage. It must be obvious to all that there is a limit both to the storage capacity and the purse of producers. Should the producers throw this coal on the market at greatly reduced prices, pocketing big losses, the result would work more hardship on the miners than good to the public. The retailers' yards are full to overflowing and the householder is buying only to supply his needs from day to day. A cut in prices now, not warranted by reduction in costs—that is, reduction in wages—would throw the market into a turmoil and stop what little buying there is. No one—producer, retailer or householder—would keep on hand a ton of coal not actually needed, and production would soon be halved, with more miners out of work.

The miners must realize that not the operators but the public is demanding that the union leaders permit the men to take reductions in wages next April. They really do know this—they are whistling to keep up their courage, hoping against hope that by demanding more they may be able to hold what they have. It simply cannot be done. As for the miners' asserting that wages can be maintained or even increased and the operators even then have sufficient margin left to lower the price to the consumer, we can but say that it is not so.

The cost of producing anthracite is as variable as the cost of living. No one questions the statistics published by the Federal Trade Commission on the cost of producing anthracite, which covers 1918 as the latest period.

The f.o.b. mine cost in November and December, 1918 (since when there has been a large increase in wages and consequently in costs), ranged from $3 to $11.10 per gross ton for fifty-six independent operators and from $3.73 to $5.82 per gross ton for nine railroad companies, whose output was, roughly, 70 per cent of the total.

Now, obviously, with the maximum difference between high and low of $2.09 per ton in the average mine cost for the nine large companies and with selling prices varying at most but 25c. it is plain to him who would read that either (1) a majority are making scandalous profits, (2) a majority are losing vast sums, or (3) there is a happy medium between these two extremes. The latter is the true state of affairs. One or two companies are making fancy profits, no doubt; a few others are making no profits, doubtless doing little more than covering out of pocket expenses, while in between, the "average" group is on a reasonable basis.

The same is true of the independents. With them there is a maximum variation of $7 in costs of production. Rest assured the fellow who had the $11 per ton cost in 1918 is not working now, nor are some if any of those whose costs three years ago were $6 or more.

Unfortunately we have no comparable general average figures of cost of living and earnings for the anthracite miners and laborers. But we can assume for argument's sake a figure, say $250 per month, as average earnings of miners. Compare the individual with a family of six, a home on which he is making payments, perhaps a jitney, piano and other modern necessities of the well-to-do. Earnings of $250 a month may look small to him; he is a high-cost miner. On the other hand is the single man—no heavy operating costs, just board for one, no heavy overhead because no real estate—he is the low-cost miner. In between is the average. The high-cost miner would like to be earning sufficient for costs and a surplus besides, but when he is idle part time, as today, he must perchance draw on his savings account. The low-cost miner, of course, is and has been making a handsome profit these many years.

The ordinary, inescapable natural laws prevent our forcing him to take a lower wage so long as he does as much work as the man with the big family. And we cannot cut all wages to a level that would permit only the single men to live. Too often the miners shout about the huge profits of one company, saying nothing about the poor relations. Too often in the past the coal operators have told us how many hundreds of dollars the best paid men earn, but nothing about the lowest. We anticipate that there will be no occasion for criticism on that score this year.

A Higher Tariff Under Another Name

IN THE midst of the confusing welter of assertion and denial from those whose interests are affected by the proposed American valuation plan, many are turning to the professional economists for counsel. This group takes a remarkably united and unequivocal stand in opposition to the measure. The grounds upon which they take their stand are, roughly, these:

In the first place, they believe that the proposed plan really means a higher tariff. They recognize that the precise rates to be imposed on the American values are the determining factor here but they are convinced that those urging the plan intend to see to it that the rates shall be sufficiently high to cover any uncertainty incident to the establishment of the new valuation basis. They suspect that at bottom the proposal resolves itself into a demand for a hidden and undetermined amount of increased protection.

The arguments, aside from this, do not impress the economists. The three which contain some modicum of force are that the plan will meet the problem of the fluctuating exchanges, that it will prevent "dumping" and that it will put up a more effective bar against the country with exceptionally low production costs. The economists point out, however, that prices rise in countries whose exchanges fail and that any disparity in the two movements is largely offset by the internal disorganization of the productive forces in the country whose exchanges are violently deranged. "Dumping," they believe, can best be prevented by administrative measures applied when the facts of a particular situation demand them.

On the other hand, the economists are considerably influenced by the contention that the adoption of the proposed plan would introduce so much uncertainty into the process of importing goods as greatly to embarrass the process.

The administrative difficulties of obtaining fair cost figures from American manufacturers interested in excluding their rivals' goods, of determining American costs in the case of goods which America does not make, and of obtaining uniform valuations at various points of entry are perfectly self-evident. Furthermore, it is contrary to all past practice and procedure in this country. It constitutes, in the words of Professor Taussig, the foremost student of the tariff in this country, "a veritable leap into the dark."

After all, however, the opposition of the economist rests back upon his conviction that the proposal is equivalent to a demand for increased rates at a time when the true economic interests of the country would not be served by the establishment of a high tariff wall.

Mining Machines and Coal Exports

GREAT BRITAIN'S evident determination to get back her foreign coal trade leads to the conclusion that she must lower costs by a large increase in the near future in the amount of machinery used for mining coal. It is believed that both operators and labor in England recognize that this step must be taken, and there already is evidence that the purchase of coal-mining machines in unusual numbers is in prospect. Heretofore British mining labor has been very successful in holding to a minimum the amount of machine-mined coal. Under present-day conditions, however, it is recognized that costs of production must be lowered if England is to enjoy anything like her pre-war volume of coal exports. What is being done in this direction is indicated by data published in this issue of COAL AGE. The curve of machine-mined coal in Great Britain is steadily upward. In the eleven years from 1910 to 1920 the proportion of the total so recovered has increased from less than 6 per cent to 13 per cent.

There are now 5,000 mining machines of all types in use in Great Britain's coal mines, compared with some 19,000 in the United States. We have had 5,000 machines in use since 1902, and in 1898 undercut more coal by machine than Great Britain in 1920. But all growth is slow at first and our competitor across the sea is learning from us—with our machines in part.

Unusually High Recovery Obtained by Use of Modified Advance System of Pillar Drawing at Indianola

In One Section of the Mine Short Rooms Are Driven and Break Line Maintained Close to Pillar Faces—Flank Headings Aid in Roof Control—Gob Sections Ventilated by Force and Exhaust Systems

By Alphonse F. Brosky
Pittsburgh, Pa.

THROUGHOUT the greater portion of the northeast panel in the Indianola mine of the Indian Collieries Co., at Indianola, Pa., the butt roadways are driven at unusually short intervals, being separated from each other by an 85-ft. instead of by the 250- to 300-ft. pillar ordinarily provided. Some interesting experiments have been made in this section. The layout of this portion of the mine can be seen in Fig. 1.

A modified "advance system" is being followed in the drawing of pillars. Consequently rooms are driven on only one side of the short butt roadways. These diminutive rooms can be seen on the right of the imaginary line joining *A* and *B*. They are 14 or 16 ft. wide and, of course, are only 85 ft. long. The room pillars are of approximately the same width. This practice of maintaining rooms and pillars of nearly equal dimensions is a wise one and should be more generally followed in this field, as it insures a greater ultimate recovery and provides greater safety in working than could be obtained by ordinary methods. Only a few rooms are to be seen on the map because such openings are not allowed to stand after driving.

Excessive Trackwork an Obvious Drawback

In keeping with the system followed, their starting is purposely delayed until the moment when they can be driven up with the assurance that the break line in its movement will cut them off. As a consequence the pillars can be drawn back immediately, keeping pace with the progress of the break line. Small rooms were driven in the hope that a high percentage of recovery would be afforded. This result was indeed obtained, yet later developments, notably in the southeast panel, have discounted the superiority of the small room, for the recoveries in the respective panels are equal. The great disadvantage of the small room over the large lies in the increase in the length of headings required, with their correspondingly increased track work.

The method of first-mining here followed was planned in the hope that with it the drawing of the pillars would be made safer than when more usual methods are adopted. After a room is started it is worked continuously until finished, its driving being followed immediately by retreat or pillar drawing.

The caved or gob region, as indicated in Fig. 1 by the area *ABC*, is triangular in shape. The hypotenuse *AB* is the line of the working faces of the pillars. In this article it will be spoken of as the break line. The angle made by this line with the main haulage depends entirely upon the widths of the room and pillar employed; the greater these widths the greater the angle *CAB*.

In the mining of the pillar coal on the retreat the room pillars are blocked out by narrow crosscuts which are placed on 8- to 10-ft. centers. The resulting blocks are approximately 4 to 6 ft. wide and 14 to 16 ft. long and with the greater length at right angles to the direction of the length of the room. It must be remembered that the working face of any one pillar cannot be pushed ahead of the break line, and that consequently the advance crosscut in a pillar is adjacent to the block being mined. The blocks are undercut by machines on the end away from the break line but a small stump is left intact near the break line temporarily. This supports the roof. These stumps are approximately 4 ft. square and are mined last, being cut away by hand. Where roof conditions are good, the stumps are completely recovered. It rarely is necessary for the miner to leave them. The greater part of the coal unrecovered is that lying in these small stumps. This pillar-drawing operation is shown in Fig. 2.

Peripheral Headings Aid in Fall of Roof

This method of closely placed butt roadways and short rooms has been adopted in only one of the panels. An even more important modification is the driving of peripheral headings on the flanks of the working section, as indicated by *CB* and *CA* in Fig. 1. These are kept a little in advance of retreating faces and insure a straight break line and an easy fracture.

In Fig. 2 let us assume that the roof falls along the line *AB* and that pillar drawing advances toward *DE*, which line will represent the new break after the area *ABDE* is mined out and the roof allowed to cave. It will be seen that as the robbing advances the roof will be supported along only one edge of the mined area, namely, along *DE*, if the headings *CD* and *CE* have caved so as to free the flanks. Thus a simple shearing stress is brought upon the roof at the break line *DE*. If the headings were not driven, the roof, in addition to being supported along *DE*, would also be supported along *BE* and *AD*. In this case the pressure acting on the roof area *ABDE* would produce a modified shear on the three edges rather than a simple shear on a single edge. The break in such a case would be irregular.

Especially Helpful in Initial Roof Falls

These headings are particularly valuable in starting a break line, as, for instance, in the area *CFG* where the edges *CF* and *CG* approach the edge *FG* in length. As the break line lengthens, the influence of the flank headings decreases. Their effect on the break line *AB* grows less because the ratio of the sum of the distances *AD* and *EB* to *AB* diminishes. The headings nevertheless still retain much value inasmuch as they aid in the drawing of the part of the pillar in their immediate vicinity. They are not timbered, as their real purpose is to bring down the roof and not to maintain a passageway.

The success attained in this method of working is attributed to : (1) The peripheral headings, which after driving cave and relieve the roof pressure upon the coal; (2) keeping the break lines straight, thus avoiding excessive pressure on any one pillar, yet simultaneously effecting a uniform line of fracture in the roof; (3) maximum production for a given section; (4) the use of bleeders to increase the ventilation in the mined-out area.

Excellent results are achieved by this method of working. No treacherous or unlooked-for roof falls occur, providing, of course, uniform progress is made at the several pillar faces along the break line. To obtain the best results, uniformity should be maintained not only in the pillar retreat but also in the room-and-pillar layout. Odd-sized rooms should be avoided wherever possible. These factors being properly controlled, the roof breaks evenly and at the time expected, so that all manifestations accompanying a roof break are repetitions of those that occurred prior to preceding breaks.

At first thought it might be supposed that this method would encourage squeezes, but no difficulty has arisen from this source. The barrier pillars are solid and show no signs of crushing or disintegration.

Record is kept of the pillars and stumps that are left standing underground. Section maps are maintained showing every portion of the unmined coal, and these are brought up to date at given intervals. If a small stump pillar is lost, it is shown on the map, with the gob by which it is surrounded. The coal recovery is calculated, moreover, by area and not by tonnage. This method is the more accurate and convenient. In the adjacent coal fields a recovery of 90 per cent generally is considered acceptable, this being the maximum obtained in the average mine. The recovery at the Indianola mine is nearer to 100 than to 90 per cent. It actually amounted to 96 per cent for the six months which ended last June.

The gob is ventilated by forcing air through it along the break line. The entries shown to the east of the

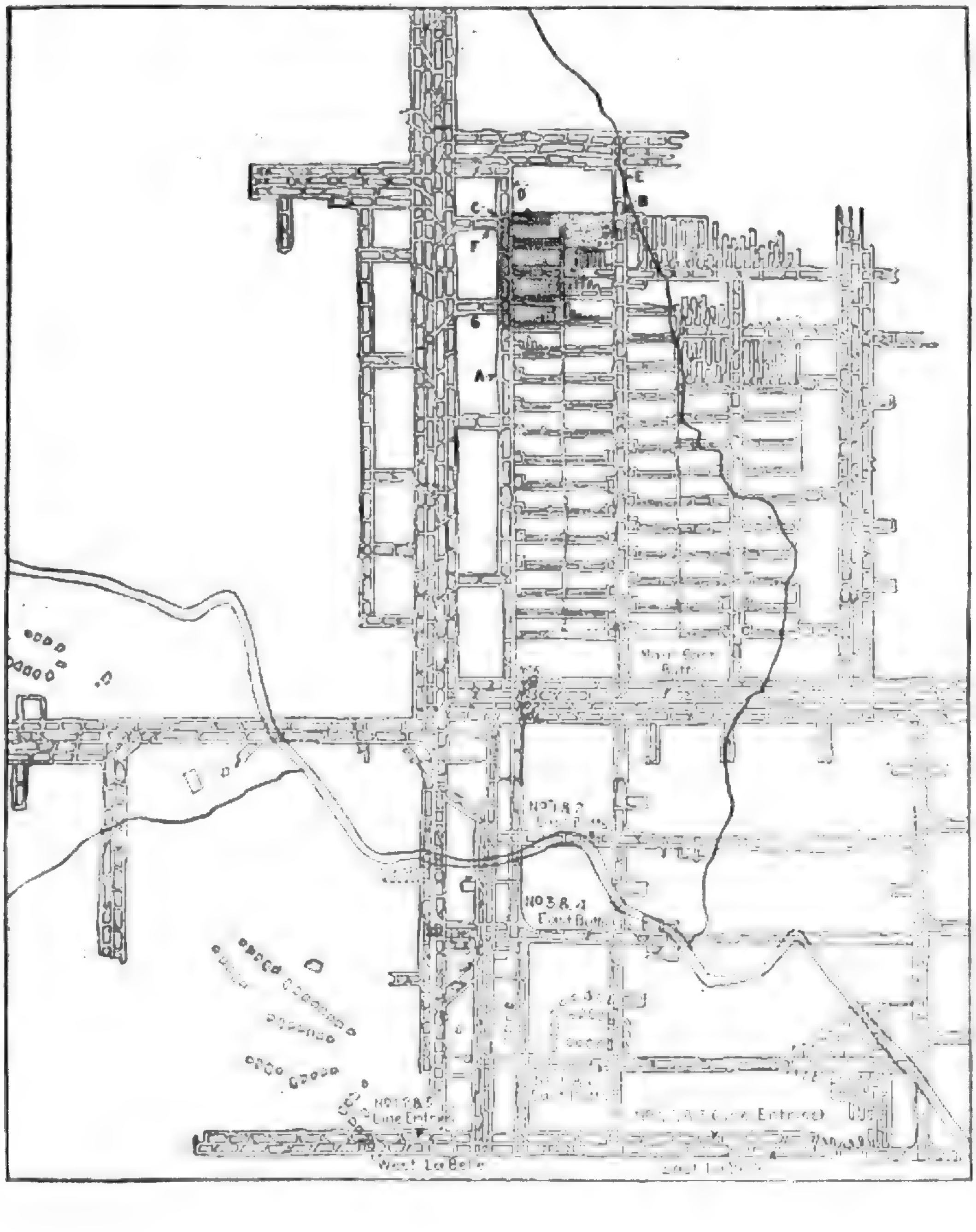


FIG. 1

Indianola Mine

The stippled area *CAB* is the area where the pillars have been removed and the roof caved. The coal in that part of the mine is being operated by what may be termed a concentration system started by roadways driven in pairs and rooms driven at right angles to these roadways. Someone appears to have discovered that if the wing pillars in roadways are big enough and strong enough, the chain pillar, that is the pillar between the pair of roadways, can be made as narrow as you please. This principle, enunciated long ago, is just beginning to be recognized and acted upon.

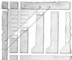


FIG. 1. PLAN OF MINING WITH SHORT ROOMS

The rooms are 65 ft. long and 14 or 16 ft. wide with pillars of equal width. When pillaring commences the rib is cut by narrow crosscuts driven as needed but spaced at 5 to 10 ft. centers. This gives a pillar 5 to 8 ft. wide and 14 to 16 ft. long, which is mined away all but a stump 4 ft. square or thereabout. This is cut away by hand.

northeast panel in Fig. 1 are intakes. In these the air travels north, thence west into the rooms and into the gob at *B*. Here it is split into two courses. One extends southwest along the break line, at the same time penetrating the gob, and thence to the main entry returns through bleeders in the pillars indicated by *F* and *G*. The gob is so tight in places that the air moving along this course does not thoroughly dislodge the gas from this section. However, no gas collects at any point away from the gob.

An exhaust effect is produced through *F* and *D*, increasing the efficiency of the air circulation through the gob from the lower split which travels along the break line. It is a simple matter to sweep the gob section entirely clear of gas. This usually is done on idle days, the full output of the fan being directed into the northeast section by stopping the air courses through the other parts of the mine. From what has been said it will seem that the ventilation in this mine is positive and always under perfect control.

In the southeast panel, rooms were at first driven on both sides of the butts. This method of working lessened the number of entries required, but it made it difficult to ventilate the workings properly. Rooms are now being driven from one side only and are being made 21 ft. wide and 250 ft. long, on 45-ft. centers. The usual room-and-pillar system is adopted with a slight modification in that the rooms are worked in sets of four. The company is obtaining excellent results in this panel, recovery being well above 95 per cent of the coal originally in the ground.

Practically all mining is now being performed in the eastern panels of the mine. In the southwest section only line entries have been driven. Still less has been done in the northwest. A five-entry butt was started in this latter area for purposes of development, tying in with the entries driven farther south, and thus opening up the two panels on the west. Not far from the main haulage a so-called rock fault was encountered. This was pierced, and a normal coal thickness again encountered. Such occurrences are not uncommon in the Freeport bed of coal.

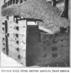
Storage Wall That Will Not Bulge or Fall

By W. K. Crosson
Detroit, Mich.

When coal without large lumps is stored and there is no room, or it is undesirable to have it run into a conical pile, walls are built composed of 1-in. hardwood with long 1-in. strips running far into the coal bed. The weight of the coal on the strips holds the wall upright and forms the means of keeping itself in curb. But too often the wall will bulge and give way, causing much inconvenience, loss in labor and endangering the lives and limbs of employees.

The wall shown in the illustration is built in sections and can be extended to any height. The material used for the box sides is 1½ in. thick, 12 in. wide and 16 ft. long. These side planks are held together at the top and bottom by a strip 2 x 4 x 24 in., sunk flush with the edge. These binding strips are spaced 4 ft. apart. A 1 x 5-in. notch is cut in the bottom and top for the treaded stringers running into the coal. These may be of any length and should project about 4 in. from the outside of the wall with a 1½-in. piece nailed to them to hold them in place.

The space between planks forming the inside and outside of the wall can be filled with coal, thus giving added strength and utilizing the stocking space to the full. A wall such as this is far more stable than the older form of construction and does not bulge or fall.



DOUBLE WALL GIVES BETTER RESULTS THAN SINGLE

In this wall the weight of the coal furnishes its own restraint through stringers which run into it. Further strength is given by filling up the space between the two walls with coal.

The film "The Story of Coal," prepared under a cooperative agreement between the Bureau of Mines and the National Coal Association, is being given widespread exhibition in India. A report from the representative of an American mining machinery firm interested in the picture's exhibition states that the film had been shown several times in Calcutta and other large centers before the engineering and coal-mining fraternity and that it was being shown at numerous important collieries.

Protective Devices So Safeguard Coal-Mine Substation At Drifton That It Needs No Attendant

Placed at Center of Load Substation Is 3,000 Ft. from Its Attendant—Provisions Made to Assure Safety of Equipment—First Motorman to Enter Mine in Morning Starts Substation and Last One Out at Night Shuts It Down

By E. B. Wagner*
Wilkes-Barre, Pa.

SEVERAL coal-mine operators and engineers on Dec. 7 witnessed an interesting demonstration of the new automatic substation at the Drifton Colliery of the Lehigh Valley Coal Co., being the guests jointly of the coal company and the General Electric Co., the manufacturer of the electrical equipment. The workings of this colliery cover an extensive territory, so that it is impractical to serve it all from one substation with current at 250 volts. The topography of the beds is such, however, that the mine is naturally divided into several sections.

It was found that the haulage requirements of two of these sections could be supplied at 250 volts from a single substation without providing extremely large feeder capacity. In order that the substation might be located near the approximate load center of the two sections, it was placed about a mile from the breaker and 3,000 ft. from the nearest point at which could be found an engineer at work during every hour of a 24-hour day, this man being in charge of a slope hoist. To save the wages of a station attendant and to obtain more uniform operation, it was decided to make the substation automatic—that is, controlled by a manually-operated pilot switch located in the engine house of the slope just mentioned.

Central-station 3-phase 60-cycle power at 11,000 volts is received at an outdoor substation placed near the slope. This is stepped down to 4,600 volts by three transformers. The alternating-current feeder line runs direct to the substation at this latter potential and thence passes on to supply hoists, pumps and fans located in other sections of the operation.

The substation is a brick building about 20 x 18 ft. in ground dimensions provided with an asbestos-shingle roof. It contains a 200-kw. 250-volt direct-current synchronous converter with the necessary alternating- and direct-current control apparatus. The tap from the 4,600-volt line goes through a pole-top disconnecting switch, a lightning arrester and choke coil of the horn-gap type and a fuse. From the fuse the line runs in conduit to an incoming oil circuit breaker operated by a magnetic contactor. Thence it goes to the converter transformers located just outside the building, from which the low-tension leads extend to the converter through the starting and running contactors.

The heart of this substation is a motor-driven drum controller that governs the sequence of starting operations and which is itself controlled by several protective devices. The operation of raising and lowering the direct-current brushes of the converter is performed by a small motor mounted on the bedplate of this machine.

Starting is accomplished in the following manner: Closure of the control switch in the engine house ener-

Automatic Substation

This substation is on the surface. It receives its power from a transformer station at 4,600 volts alternating current. This current passes through a pole-top disconnecting switch, a lightning arrester, and a choke coil of the horn-gap type and a fuse. Thence the line runs in conduit to an incoming oil circuit breaker operated by a magnetic contactor, and passes to the converter transformers and thence to the converter through starting and running contactors.

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*Electrical Engineer, Lehigh Valley Coal Co.

Inside of Substation

Building has ground dimensions of 18 x 28 ft. It contains a 200-kw. 275-volt direct-current synchronous converter with the necessary alternating- and direct-current control apparatus. A small motor mounted on the bedplate of the machine raises and lowers the direct-current brushes of the converter. Among the protective devices are a dashpot timing relay to provide against too great slowness in starting, temperature relays, potential relays, a bearing temperature relay and standard induction-type overload relays.

gizes a voltage relay which closes its contacts, provided the alternating-current potential is high enough for satisfactory operation. The closing of the contacts on this relay energizes a main-control contactor, which in turn closes, provided the various protective devices, described later, are in proper position. Provided the direct-current brushes are raised, closure of the main control contactor starts up the motor by which the controller is driven. If they are not raised, the circuit is first completed through the brush-raising motor, which then performs its function and stops, thus completing the circuit to the controller-driving motor. The controller drum starts revolving and first closes the incoming-line oil circuit breaker and then the contactor that starts the converter.

The converter now starts operation and comes up to speed. While this is going on, the rotary field is flashed across the terminals of a small direct-current generator driven by the drum-controller motor to insure that the field will be built up with the right polarity. After being flashed the main field contactor closes, putting the field onto the converter. The converter should now be up to synchronous speed, but if it is not, the controller stops revolving. When synchronous speed is reached, a centrifugal switch on the converter shaft closes its contacts, restarting the drum controller. This opens the starting contactor control circuit and completes the circuits of the running contactor, whereupon it closes, putting full alternating-current voltage on the converter terminals.

The direct-current side of the converter is controlled by a generator type of automatic reclosing circuit breaker. The two power circuits served are equipped with similar apparatus of the independent feeder type. After normal direct-current voltage of proper polarity is applied to the converter leads a polarity relay closes the circuit of the operating coil on the generator breaker. This breaker then closes, as does also each feeder breaker after a predetermined time interval, provided the direct-current feeder line is clear.

On stopping, the control switch is opened, thus in succession cutting out the voltage relay, main control contactor and running contactor. This restarts the motor driving the drum controller, which accordingly revolves, tripping out the incoming-line oil switch and completing the circuit to the brush-lifting motor, which then functions, after which both machines cease operation and all devices are in the "off" position ready to restart. As the locomotive drivers from both sections supplied from this substation must pass the slope engine house it is the intention to have the last man out at night stop the equipment and to have the first one in in the morning start it.

This installation is provided with the protective devices described in the following paragraphs:

A dashpot timing relay provides against excessive slowness in starting. This is held in a picked-up position until the starting contactor closes, whereupon it begins to settle. If it completes its movement before the running contactor closes (which would pick it up again), it closes its contacts and energizes a lockout relay which opens the control circuit of the main contactor. This relay is of the type that must be reset by hand.

Temperature relays prevent excessive overheating of the machine windings. These open the circuit of the main control contactor until the windings cool down, whereupon a restart is made. These relays are adjusted so as to have a slightly greater rate of heating than the machine windings. A flash-over on the alternating-current collector rings energizes one of three current relays, which in turn energizes a notching relay and opens the main control-contactor circuit, causing a restart to be made. If operated three times without being reset by hand, the notching relay on the third operation locks itself out, causing a permanent shut-down until this device is reset manually.

A potential relay across one phase and the previously mentioned voltage relay across the other phase prevent single-phase starting. These hold out the main control contactor until three-phase power is supplied. If single-phase occurs while the station is in operation the converter will continue to run unless the current consumed becomes sufficient to cause one of the three temperature relays to function. The machine will then stop and refuse to resume operation, as this would necessitate single-phase starting.

Another temperature relay prevents the machine bearings from overheating. Similarly overspeeding is forestalled by an overspeed trip switch mounted on the converter shaft. These devices open the main control contactor circuit and must be reset by hand.

Standard induction-type overload relays which trip the main oil circuit breaker provide against short-circuits in the station wiring. This, upon opening, if the other apparatus is in the running position, energizes the lockout relay, thus tripping it and causing the station to shut down.

In the slope engine house a small panel has been installed. This has mounted upon it a control switch, direct-current voltmeter and three incandescent lamps. The direct-current voltmeter is connected to the terminals of the converter and indicates when that machine is up to speed with proper voltage. One lamp is connected to each trolley wire. Thus they show that the direct-current breakers have closed properly. The third lamp gives an indication that the alternating-current power supply is on.

Is Coal a Mineralized Peat Bog or Has It Been Formed From Woody Deposits of Great River Deltas?

Peat-Bog Theories Assume That the Earth's Surface Has Vibrated Like a Drumhead—Granting the Deposit Is Derived from Vegetable Matter Carried Into the Sea by Rivers, This Difficulty Is Removed

By H. W. Hixon
New York City

THE theory that coal was formed where the vegetation composing it grew is open to many serious objections. Chief among these is the fact that in any coal region many beds may be found, and if this theory were true for each bed it would be necessary to assume that the land had been elevated above the sea or lake level during the growth of the vegetation and depressed below sea or lake level to receive the covering of sediments which later turned to stone and now form the bulk of the coal measures.

Thick beds of sedimentary rock, most of which are of marine origin, require us to assume adequate erosion areas from which the materials of which they are composed may have been derived. This can signify but one thing: That the whole of the coal measures were at one time a vast delta deposit or dump from some previously existing continental land mass which has since subsided below sea level.

Atlantic Continent Supplied the Detritus

During a geological period that preceded the formation of the sediments which now compose the rocks of the Appalachian coal measures a continent existed to the east of the present continental mass of North America. The Appalachian coal measures are composed of the eroded material derived from this no longer existing continent. The location of this erosion area can be confidently stated because sediments are always thickest in the direction from which the material composing them was derived. The rocks forming the coal measures of the eastern part of the United States are thicker in the east, and thin out toward the west. Areas of deposition are always smaller than those of erosion in the ratio of 1 to 10 or more, and on this basis the Appalachian continent was a vast area with a large river or rivers comparable to the Mississippi emptying into a gulf or sea like the Gulf of Mexico. The Mississippi carries to the sea, as sediment and in solution, enough material to lower the surface of its drainage basin 1/6,000 of a foot per annum. Accompanying it is a vast quantity of vegetable matter which floats on the surface of the water.

Some of the vegetable matter, having become waterlogged, sinks below the surface and is driven along with the sediments. Such vegetable matter as floats continues to float for some time after reaching the sea, and does not become waterlogged until it has drifted free of the sediments and reached clear water. It finally sinks and forms on the sea floor a thick mattress of woody material free of impurity. The sediments build out from the delta of the river mouth and in time cover this woody mattress, thus completing the first stage of coal formation.

A delta has several mouths, and the dominant mouth at any time does not remain such for all time. This main mouth will naturally discharge the greatest amount of water and sediment and also of woody or vegetable matter. Each mouth of the delta, however, will discharge a portion of the total burden carried by the main river; otherwise the mouths would fill up and cease to exist. The vegetable matter, because it floats, will go farther out to sea than the sediment. It spreads out fan-shaped from the river mouth and is followed by the sediments in the order of their fineness. The sediments also will spread out in a fan shape, thinning out as the distance from the river mouth increases.

Imagine the river represented by the arm and the delta by the fingers of the hand, each mouth carrying its share of the sediments and vegetable matter to the sea. In front of each mouth is building a more or less thick mattress of vegetable matter which has floated out into clear water, become waterlogged and sunk to the bottom. These various mattresses of vegetable matter intersect and unite into one continuous mass in the direction of the sea, but near the delta they diverge and are separated by the following fan of fine sediments. This may account for the branching of the coal beds and for the slate and shale partings in coal deposits.

The slate partings in coal beds are persistent over extensive areas and show that they were formed from extremely fine mud deposited in quiet water; otherwise they could not be so uniform in composition and thickness. All shallow water sediments show ripple marks; the absence of these from the slate and clay partings in coal beds indicates that they were deposited in deep quiet waters. It also has been observed that when the roof of a coal bed is composed of black slate the roof is thicker than when it is composed of sandstone. Partings always thicken in the direction in which the other adjacent strata thicken, and thin out in the opposite direction. A delta is, therefore, capable of building a series of coal beds simultaneously which may be separated by barren material. The delta consists of a branching series of beds with clay partings between the members of the same coal deposit, and all the other phenomena that the theory of growth in place cannot explain unless it makes the unreasonable assumption that the surface of the earth has vibrated like a drumhead.

ARCTIC COAL MAY HAVE COME FROM SOUTH

It has been argued that, because fossil plants of tropical origin are to be found in the coal measures of high latitudes and because coal beds of considerable thickness are largely composed of such plants, the Arctic must have had at some time a tropical climate. If we consider that rivers in previous geological ages may have had their sources in the tropics and their deltas in the Arctic, we can see how far from the mark this evidence may have been interpreted.

Waterlogged vegetable matter carried along with the sediments into the sea becomes embedded in these sediments and gives rise to the carbonaceous shales of the coal measures. Thus it happens that we find all stages, from pure coal, resulting from vegetable matter sinking in clear water, to carbonaceous shale, which will not burn but which, nevertheless, contains an appreciable quantity of carbon.

TREES WILL SINK WITH THEIR ROOTS DOWNWARD

It also has been argued that because the roots of trees are found in coal in normal position, this is indisputable evidence that the vegetation grew where the coal is found. Nothing further from the truth could have been offered as evidence, because trees swept out to sea by floods always sink roots downward, as the roots become waterlogged first, and naturally go down in the position in which they grew. Furthermore, the waterlogged, woody mattress that later turns to coal may accumulate on any eroded land surface that sinks below lake or sea level. Such a surface may well be covered at the time of sinking and inundation by growing vegetation. The roots of the trees and their stumps would appear to indicate that all the vegetation grew where the coal is found, whereas only a minute portion of it actually grew there. The case of Reelfoot Lake, in Tennessee, which was submerged during the earthquake of 1811, will illustrate this point. An area 7 x 20 miles sank, so that boats can now float over the tops of tall trees. If this lake receives a large amount of driftwood which becomes waterlogged and sinks and is later covered with sediment, all the conditions for the proof of either theory will be present, whereas the major accumulation will be due to drift.

Tidal currents of varying velocity are known to run along coasts, and this would cause the removal of the woody matter from the ocean bottom or prevent its accumulation. In this way can be explained the thinning of the coal or its absence over certain areas. At New Orleans attempts were made to sink deep wells for the purpose of obtaining artesian water. At a depth of about 1,100 ft. a mattress of wood was encountered.

The mud lumps which form the delta of the Mississippi may be explained by the accumulation of marsh gas, resulting from the decomposition of the woody matter at great depth beneath the clay of the delta. These mud lumps have been known to rise in the stream channel and change the course of the river, thus interfering with navigation. Occasionally small islands are formed in this manner near the deltas and gas and salt water are discharged from the summit of the domed-up land.

During the earthquake at New Madrid in 1811-13 it is stated that vast quantities of water were spouted from craters in the sandy soil. Lignite was brought up by the water. New Madrid is within the old delta of the Mississippi, although only a short distance below Cairo, Ill., and the mattress of wood at that point is partly carbonized to coal, whereas at New Orleans it is still wood.

It would appear, therefore, from the evidence at hand, that a series of coal beds is forming at the mouth of every great river which drains a region where vegetation is plentiful. This probably has been the case in all ages and will continue to be so as long as rivers flow and wood floats to the sea.

Which Powder Is Best for Tracing Cloth?*

By L. A. LANSING
St. Louis, Mo.

PREPARED powders for application to tracing cloth on which inklines are to be drawn have long been on the market. Some of these are sold under trade names. Sometimes powdered talcum and pumice stone are used for this purpose. Experience has shown, however, that the best material for this service probably is precipitated calcium carbonate, the common name for which is "precipitated English chalk." This is relatively inexpensive. A 1-lb. cylindrical container of calcium carbonate can ordinarily be purchased from any druggist for about 35c. Such a supply will suffice for a considerable period, even in a relatively large drafting office.

Powdered pumice stone sometimes cuts the tracing cloth and always tends to dull the ruling pen, hence its use is inadvisable. Powdered talc, while satisfactory when first applied, ultimately renders the surface of the tracing cloth greasy. For these reasons, calcium carbonate appears to be the preferable material.

EXAMINATION BY THE BUREAU OF MINES of samples of lignite taken in the Bluff Point mine, located 16 miles north of Seldovia, Alaska, and about 140 miles south of Anchorage, in that territory, reveal that this lignite is of fair quality and generally is preferred to the bituminous coal brought up from Vancouver Island or the States. It usually is sold locally to the canneries, although occasionally small boats take a load to Cordova and Anchorage. The price at the mine is $5 per ton of 42 cu.ft. A heating plant, especially designed for the burning of Alaskan lignite, has been installed at the Alaskan Experiment Station at Fairbanks.

BUSINESS IS FINDING OUT that if buyers will not fall for prices, prices must fall for buyers.—*Norfolk Virginian-Pilot.*

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How Mine-Motor Armatures Should Be Soldered

Connections Should Be Cleaned and Then Tinned or Covered With Liquid Flux—For Overworked Equipment Use Pure Tin for Solder—Half Lead and Half Tin Serves Where Locomotives Are Not Overloaded

By H. H. Johnston*
East Pittsburgh, Pa.

When armature leads are to be soldered to commutators the connections should be free from dirt, oil, grease, paint or insulating material. In many repair shops it is difficult to attain this immunity. Before attempting to solder the leads or armature coils to the commutators they should be cleaned thoroughly and then tinned. Liquid flux brushed onto the cleaned metal parts and then allowed to dry offers a substitute for tinning, as it forms a thin coat over the cleaned surfaces which will remain until solder is applied.

Mention was just made of liquid flux. This term is applied to the material used to make the solder flow readily and to cause it to attach itself to the metal. This flux is made in either liquid or paste form. The compounds, of which there are many, give good results and may be used without harm. It is well to test the flux from time to time and, when deciding on which grade to use, to ascertain by the aid of litmus paper whether acid is present. This paper will turn red in the presence of acid.

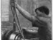

FIG. 1. SOLDERING AN ORDINARY COMMUTATOR

When this method is used the solder frequently works back and joins adjacent leads, short-circuiting them. This is particularly likely to occur when pure tin is used as solder.

When the motors are operating at high temperature or are overworked it is advisable to use a solder of high melting point. Pure lead melts at 325 deg. C. (617 deg. F.). A solder composed of one part lead and one of tin has a melting point of 180 deg. C. (356 deg. F.) and is known as "half-and-half." Pure tin melts at 230 deg. C. (446 deg. F.). Pure lead cannot be used, as it is difficult to work, will not flow when heated by the soldering iron and cannot be made to cling to copper.

Pure tin, on the other hand, flows easily and rapidly and so can be used, but it tends to spread beyond the surface being soldered. Greater skill, therefore, is required when using pure tin. It will eat itself into the copper if too long overheated. It is more expensive than half-and-half solder, but when motors are overworked or subjected to high temperatures and overspeed it should be used in the soldering of the armature bands as well as for attaching the coil leads to the commutator necks. Whenever tin is used, on account of its free-flowing quality the clearance between the parts being soldered should be as small as possible.

When motors are being operated under normal conditions of load and subjected to neither excessive temperatures nor overspeeding, which latter causes unusual mechanical stresses, half-and-half solder gives good results.

Where special soldering pots are not in use the common practice followed in soldering the leads to commutators is as illustrated in Fig. 1. With this method solder will frequently work back, short-circuiting adjacent leads and commutator bars. Special care is necessary to prevent this, particularly when pure tin is being used.

Soldering Leads by Wholesale Methods

A process that makes it possible to solder at one time all the leads to the commutator is illustrated in Fig. 2. In shops where a large number of motors are repaired this equipment is indispensable. The armature is placed commutator end down over a central opening. Solder is then caused to flow around the neck of the commutator by a lowering of the plungers in the two pots containing the molten metal. After the solder has been in contact with the commutator neck and leads connected thereto for several minutes it is drained back into the end pots by raising the plungers. The armature is then lifted away, whereupon another armature can be similarly treated. With this equipment all the armature-coil leads are soldered to the commutator in one operation without danger that any excess of solder will work back of the commutator necks.

Fig. 3 illustrates the soldering of armature-coil leads to the type of commutator that is fitted with risers. This operation is performed from the side, a wide-tip soldering iron being used. Excess solder will not tend to flow back from the connection provided the end of the armature opposite the commutator is raised about six inches. On the other hand, if this is done the solder will tend to flow toward the forward end of the armature, as is desirable.

Soldering irons most commonly used where any great amount of this work is done are of the self-contained type. The arrangement is such that the iron is heated either by gas flames or by an electric heating element.

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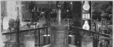
*General engineering department, Westinghouse Electric and Manufacturing Co.

FIG. 2

Soldering All Leads at Once

Soldering pots of this kind are particularly useful in large shops. Suspending the armature commutator end down, the commutator is lowered into the melted solder until the latter comes in contact with the commutator necks and with the leads. There is no possibility of the solder running back too far along the latter. After a few minutes the molten solder is drained back into the side pots by raising the plungers (bowl). The armature may then be lifted out and other commutators soldered in like manner. Great speed of operation in the soldering process may thus be attained and the work is performed in the best possible manner.



The ordinary soldering iron heated by a separate gas flame is much used, but appreciable time is lost and not as good work can be done, even by the use of relays of irons, for solder cannot be worked satisfactorily where there is a wide variation of temperature. Fig. 1 shows a self-contained type of iron, gas heated.

In order to obtain good results when soldering observance of the following precautions is necessary: (1) The connections to be soldered should be cleaned, tinned and kept clean until they are soldered. (2) The iron should be of a good size, so as to hold heat for long periods; 2 or 3-lb. irons give good results. (3) The work should be performed with a hot iron. (4) Pure tin solder should be used unless it is certain that the temperature range of the armature will be such that half-and-half will give satisfactory results. Solder in thin strips 10 or 12 in. long will be found of handy size. (5) The soldering iron must be kept well tinned at all times. To tin an iron, file the surface clean, heat and dip in a strong solution of zinc chloride, then rub a solder stick on the hot iron to give a good tinned surface. (6) The use of too much soldering flux should be avoided.

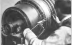


FIG. 3. SOLDERING A COMMUTATOR WITH RISERS

A wide-tip soldering iron should be used in this process, and if the joint lies in a slightly inclined position while being soldered, the molten metal will not tend to flow back along the leads.

AN EXAMINATION HAS BEEN MADE by Bureau of Mines engineers of development work on a deposit of lignite near Reno, Nev. Preliminary experiments looking toward possible beneficiation of the material have been made. The shaft is about 45 ft. in depth and discloses a seam of lignite at least 30 ft. thick at the opening. The material improves with depth, and it is hoped that it will be available as a domestic fuel after briquetting and possibly as a power fuel in the vicinity of Reno.

AT THE EXPLOSIVES LABORATORY at the Pittsburgh experiment station a series of sand tests has been completed with the object of ascertaining the accuracy of the tests for determining the efficiency of a detonator for use with explosives. Further work is being done with T. N. T., tetryl, and California detonators along the same lines. From the results it will be possible to formulate specifications and tolerances for the detonators now in use and indicate means of testing and fixing tolerances for any new types that may be developed.

"WHAT KIND OF COAL do you want, madam?"
"What kinds have you?"
"We have egg coal, chestnut coal and ———"
"I guess I'll take egg coal; we have eggs oftener than chestnuts."—*American Druggist.*

Cage-Operated Stop Makes Caging Safe and Efficient

Caging at Shaft Heads or Landings Is Accompanied by Much Risk of Improper Manipulation and Consequent Delay—Device Described, If Made Entirely Automatic in Operation, Renders Such Mishaps Improbable

By Dever C. Ashmead
Kingston, Pa.

IMPROPER design of shaft heads and landings may cause accidents that will seriously delay the hoisting of coal, though without injury to those who operate them. Thus an improperly-designed station is one where cars may, upon occasion, get beyond control and run into the shaft, with disastrous effects to the guides, buntons and timbering, tearing out wires and piping and smashing cages, should they happen to be in the path of the car.

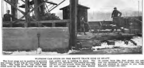
No matter how careful and efficient the cager may be, so long as the human element is not entirely eliminated he is likely to make mistakes. These mishaps, unfortunately, almost invariably occur during the rush hours. The resulting damage to equipment, serious though it may be, usually is secondary in importance to the loss arising from delay to operations and the consequent reduction in output.

Furthermore through improper design shaft stations may be rendered not only liable to accident but highly uneconomical as well. In the effort to counteract this deficiency men may be employed in unnecessary numbers. Thus there is a waste of labor that might have been put to more productive use had the station been properly designed.

Gravity, when intelligently utilized and not abused, is one of the most satisfactory of forces for the movement of cars at a shaft landing. To accomplish the desired result, however, the grades must be steep enough to effect movement of the stiffest cars and short enough to preclude the possibility of their attaining dangerous momentum. Such a grade, however, must be sufficiently long to accommodate the longest trip of cars that will have to be handled. In other words, a stop must be provided at the landing against which the trip must continuously press. The only distance through which the cars can move freely is thus from the stop to the cage, and this should not greatly exceed one car length. Furthermore, they can traverse this distance only when the stop is released, permitting their passage.

With a single storage track serving a two-compartment shaft such an arrangement as has been above outlined is out of the question, as it is then necessary to install a switch in such position that cars may be run to the compartments alternately. This means that they must traverse an appreciable distance before they reach the cages or the stops immediately in front of them. Yet such a grade must be steep in order to accommodate stiff cars. The result is that those that are free-running must be spragged or braked in order to prevent them from attaining such a velocity as to cause damage either to the car or stop. If the stop fails under the impact the car is likely to go into and down the shaft.

The device known as the Watkins car stop, invented by C. W. Watkins, of Kingston, Pa., a hoisting engineer for the Glen Alden Coal Co., has been adopted by this firm at many of its plants. This contrivance embodies practically all the qualities that an efficient car stop should have. It is simply and substantially constructed and not liable to derangement. As may be seen in the accompanying illustration, this device consists of a beam or beams pivoted in the middle and somewhat enlarged vertically at the ends. The pivot bears against a coiled



WATKINS CAR STOPS ON THE EMPTY TRACK SIDE OF SHAFT

The front stops are in position to prevent any motion of the trip of cars lying behind them. The stops in the rear have been tilted down by the lever which the boy has just pulled and is holding in place. The empties can, therefore, run toward the cage, till one car has passed, when the stop will tilt and refuse passage to those behind. Of course, boys like that shown are not only not entrusted with work like this but are not allowed to engage in any work whatever around the mine.

PEACH ORCHARD HEADFRAME OF GLEN ALDEN COAL CO.

Separate supply storage tracks feed separate compartments of the shaft and each compartment receives its loaded cars at the foot of the shaft from a separate storage track. Thus the car stops can be placed near the cages.

spring which eases the shock between trip and stop. It may be so arranged as to be either partly or entirely automatic in operation. In the first instance, it is under control of both the passing car and a hand lever; in the second it is controlled by the car and cage alone. Circumstances will determine which arrangement is preferable at any particular location.

The device is normally set at a distance equivalent to one car length from the cage landing or shaft compartment. It rests upon and is supported by at least three ties, the last of which is braced to the shaft timbers. Except while a car is passing over it the stop never sets in any position other than against the trip.

The installation at Pettibone Shafts Nos. 3 and 4 may be taken as typical of these stops; the grades approaching the shaft are sufficiently steep to permit the cars to move freely yet are long enough to accommodate a trip of either loads or empties depending upon whether the surface landing or a shaft station is under consideration. As in any case the grade is steep the cars rest with bumpers touching and with the axle of the leading car against the stop. When a car is to be caged a hand lever is thrown. This lowers the end of the stop resting against the axle of the leading car, permitting it to move onto the cage. The remaining cars of the trip simultaneously move forward.

The device is of such length and conformation that it permits both axles of the car to pass the forward end of it, at which point the leading axle depresses the rear of the stop, thus raising the forward end so that it will arrest any further movement of the trip.

As the trip can thus move only through the distance vacated by the car crossing the stop, it attains no dangerous speed or momentum. Thus only one car can pass the stop at a time, and as it is only slightly longer than the wheelbase the device is in position to arrest movement of the succeeding car before the first one has passed beyond it.

This type of stop is semi-automatic and the only chance of accident arises from the possibility of the cager manipulating the lever at the wrong time. This can be avoided and the entire mechanism made automatic by means of an attachment whereby the cage upon reaching its landing throws the stop. By this means a car cannot pass the device except a cage be in proper position to receive it. If at any time it is desired to use the cage for hoisting or lowering other materials than coal the stop-operating mechanism may be disconnected, locking the device in the "closed" position and effectively preventing the passage of cars.

Employment of a stop of this kind permits gravity to be utilized in the movement of cars without danger of their running away and being precipitated down the shaft. The stop is always set against the cars except when the levers are wrongly manipulated. This risk may be entirely removed by making the operation entirely automatic and so free from the danger which is always present when the human element is relied on.

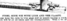
Steel Mine Tie with Tee Clamps Fitting Into Lugs Holds Rails to Gage

STEEL mine ties have long been used in and about the mines, until the shape of the tie itself has become fairly well standardized. Improvements in design, therefore, are largely confined to the means of fastening the rail to the tie. Many devices varying widely in detail have been developed. The latest steel tie to make its appearance is that of the McLellan Mfg. Co., of South Charleston, W. Va.

As may be seen in the accompanying illustration, this tie, like most others, consists of a light channel iron. Out of the bottom of this channel at the proper distance apart lugs or loops are pressed. Through these, T-shaped clips are driven, one point of the tee resting on the flange of the rail while the other bears upon the tie. These clips not only hold the tie and rail securely together but maintain the rails at proper gage. When the clips are driven home, bending their ends downward over the edge of the tie holds the clip in place and prevents it from slipping and releasing the rail.

When it is desired to lay a jumper rail this may be done by means of a special clip wherein one leg of the tee is bent upward, so as to bear against the ball of the jumper rail. It will be at once apparent that the jumper may be readily loosened and slid forward, then retightened at the desired point.

The following claims of superiority for this tie are made by the manufacturers: (1) It reduces the cost of laying track by reason of the speed with which the operation can be performed. (2) If a change from steel to wooden ties is desirable, this can be made with the steel ties in place and the rails will consequently be to gage, after which the steel ties can be removed. This can be done without interruption to service. (3) The gage cannot be changed even where a jumper rail is employed. The rail cannot be removed so long as the clips are in place except by sliding it through the clips. (4) The sharp corners and edges of the tie in contact with the ground tend to dig into the bottom and prevent movement of the track. This is a particularly advantageous feature on curves.



STEEL MINE TIE WITH LUGS AND TEE CLAMPS

Lugs keep the rails to true gage and so assure having a track which will be at all times safe for transportation. With a tie of this type track gages are unnecessary.

Collapsible Danger Signal for Firebosses Acts as a Warning and a Fence

By R. W. Lightburn
Gans, Pa.

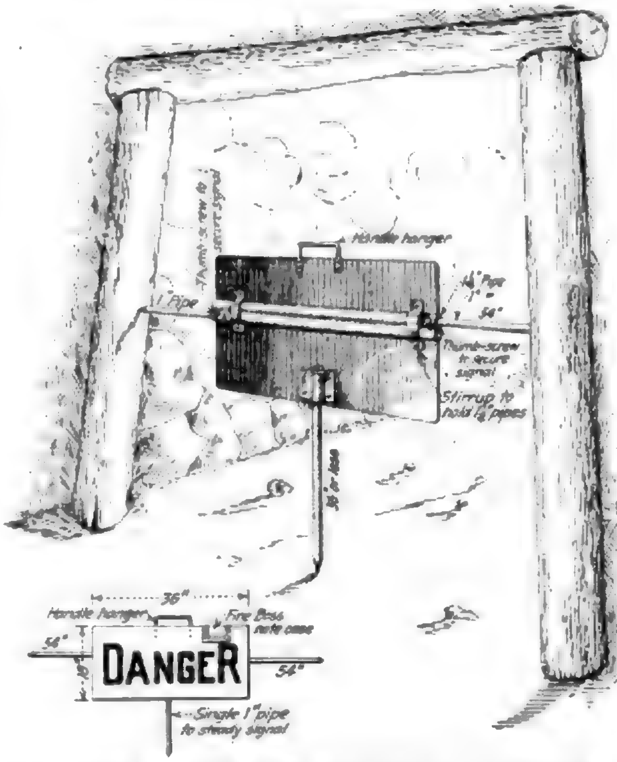
MUCH difference of opinion appears to exist as to the proper kind of danger signal for general use. A signal of this kind should be such that all persons approaching it will be amply cautioned that danger lies ahead. To assure that all comers will be adequately forewarned, some kind of living monument would need to be stationed at an uncountable number of places. This, of course, is out of the question. In its absence a signal with plain letters inscribed upon it should be so placed that all who are concerned cannot fail to see it.

Such signals should be so made that they readily may be set up at the entrance or entrances to all dangerous places. The fireboss in the course of his examination prior to the working shift may have occasion to place several danger signals. Quite frequently it will take him some time to find a suitable board, and when found trouble may be experienced in placing it satisfactorily. Many times a danger signal is leaned against a chunk of coal placed upon the floor in the middle of the track. This is by no means a satisfactory warning.

At best the fireboss has about three hours in which to make his examination and to place adequate danger signals. He has no time to hunt for an ax, a post and a nail. He is almost certain, therefore, to be behind time in reporting his section of the mine in shape for the men to enter, and the entire operation in such a case is robbed of an appreciable percentage of its output.

The accompanying illustration shows a danger signal that can be placed in position securely and in such a way that no person can pass it without being fully aware of the fact. This contrivance is so simple that it needs little explanation. The frame is made of 1¼-in. pipe; the signal is 36 in. long and 18 in. high, the letters being 10 in. high and red upon a white background. The side legs are so made that they will extend to any width from 30 in. to 12 ft. The signal can be placed upon a post or X-bar by driving a nail and suspending it from the hanger provided for that purpose. The lettering can be made larger if necessary, and other alterations can be made to suit local conditions. One advantage possessed by this danger signal is that it cannot be overlooked or inadvertently passed.

A pocket is provided for a card or cards upon the back of the danger signal. These cards can be picked up by the mine foreman or assistant and checked with the permanent report in the record book. While this signal may seem to be unnecessarily heavy, this defect is more than compensated by the fact that it is a combined signal and fence. This I have proved many a time to be a great advantage.


Thumb-screw to secure signal
Handle hanger
1" Pipe
1¼" Pipe
54"
Thumb-screw to secure signal
Stirrup to hold 1¼" pipes
36"
Handle hanger
Fire Boss note case
54"
DANGER
18"
54"
Single 1" pipe to steady signal

DANGER SIGNAL TO BE ERECTED BY FIREBOSSES

A dangerous place in the mine, especially one which involves the explosion hazard and into which the entry of a person is likely to do injury to more than to the one person thus trespassing, should be protected by a sign that cannot be unwittingly passed. That shown above is also a fence. It is so safeguarded that it is not likely to fall down. The man who would pass it must remove it or crawl under it, and if he does so, and meets with an accident, the fault is his alone.

FIREBOSS' BLANK CARD

Danger from Roof

Danger from Gas

Danger from Side Walls

Danger from Broken Posts

(Mark × against dangers found)

Time: Signature..........................

Date: Occupation.........................

Ventilating Fan Ignites Gas in Upcast, Causing Severe Mine Explosion

By F. C. Sinback
Oak Grove, Ala.

SEVERAL years ago I was employed at a large coal mine which had at its airshaft a steam-driven fan receiving steam from a single boiler located near the fan house. Every three or four weeks the boiler had to be cleaned or repaired, and consequently it was necessary to close down the fan. On such occasions every man was taken out of the workings and the circuit breakers and switches on every mine circuit were pulled out, removing any possibility of firing the gas electrically.

One Sunday, however, after the ventilation had been suspended for two or three hours, the fan was restarted. It had been running only about three minutes at slow speed—for it was the general practice not to speed it up until it had run five or ten minutes—when a terrific explosion occurred. Fortunately, there was no one in the mine nor in the fan house either, the engineer, after having put the fan in motion, having walked into the boiler room, which was distant about 75 ft.

The state inspectors and the representatives of the U. S. Bureau of Mines after making their examinations concluded that a fire probably had been left burning in the mines and that the fan when started drew an explosive mixture over this fire, with the unfortunate result related. I was master mechanic of the mine at the time and in making repairs to the fan house, which was damaged by the force of the explosion, I found that the fan wheel was loose on the shaft and on closer examination I discovered that it evidently had been loose for some time, for it had worn the key and key seats quite perceptibly.

The fan was enclosed in a steel housing which at the sides afforded little clearance. On finishing my repairs on the fan house and being ready to start and test the fan I remained inside the fan house to see how the fan would behave when the engineer started it up. This is what I saw: When the fan reached a certain speed below the normal speed of operation it shifted along the shaft and struck the housing, making a shower of sparks such as steel will emit when being ground on an emery wheel. Since that moment I have been convinced that the shifting of the fan and the sparks emitted when the fan struck the housing were the cause of the mysterious explosion of that Sunday afternoon, for undoubtedly an explosive mixture of gas and air was being drawn through the fan at that time.

Anthracite Inspectors Discuss Blasting, Electrical and Mine Fire Dangers

FOR the first time in the history of the anthracite inspectorate, the mine inspectors threw open to the public one of their regular semi-annual meetings, the State Department of Mines specifically requesting the operators to be present at the sessions held in the ballroom of the Reddington Hotel in Wilkes-Barre beginning Thursday, Dec. 15. The preliminary session was, however, for the mine inspectors exclusively, twenty-one men being present.

The afternoon meeting was open to representatives of the operators. The first paper, which was presented by D. J. Roderick, was on danger signs. After some discussion motion was made and passed that the inspectors declare their preference for the adoption of the danger and warning signs now used in the bituminous coal fields of Pennsylvania.

The next paper, on "Delayed and Premature Blasts," was presented by Inspector S. J. Phillips. Attention was called to the dangerous practice of drilling with undersized bits. The author advocated that each section foreman carry gages and see that all drills be kept of sufficient size to allow the free insertion of the explosive cartridge. He called attention also to the pernicious practice of shortening squibs and recommended that men be prohibited from returning to a blast within fifteen minutes after the ignition of the squib. He also thought that every man should carry a watch. The discussion which followed indicated a preference for legislation that would make electric blasting compulsory.

Inspector P. J. Moore presented the next paper, which had reference to "Electric Haulage." During the subsequent discussion it was brought out that the inspectors were in favor of the use of storage-battery locomotives in preference to trolley machines throughout gassy regions of the mine. They particularly favored such types of locomotives as are gas- or flame-proof.

Many of the inspectors objected to the use of electric locomotives where locked safety lamps are employed. A motion was made embodying this objection, but it was strenuously opposed by a number of the inspectors and representatives of the operators. The discussion brought out the fact that in many instances locked safety lamps are used where no traces of gas are found, lamps of this type being employed as a purely precautionary measure. The motion accordingly was laid on the table to be taken up at a later meeting.

On Friday, Dec. 16, "Mine Fires" were discussed, Mr. Walsh leading. This subject was illustrated by drawings showing that a fire existed at the face of two rooms on a cross-entry on which seven rooms were located. The inspectors went on record as favoring the building of a stopping in the return in preference to one in the intake when fighting fires of this character.

Fighting mine fires by means of inert gases also was discussed by Mr. Walsh. The method he proposed was the removal of oxygen from the air by passing it through a fire, then through a pipe under water, thus reducing the temperature of the gases to about 700 deg. After this the gases would be passed through a cooling tower and their temperature lowered to about 70 deg. They would then be forced into the fire area by means of a force fan. It was estimated that a plant of this character sufficiently large to produce 15,000 cu.ft. of inert gas per minute would cost about $20,000 and that the cost of the gas itself would be about 1c. per 1,000 cu.ft. Mr. Walsh stated that flue gas from the mine boiler plant could not be used, as this usually contained too much oxygen.

It was believed by many present that the method proposed would be impractical in case of a fire where the ground was broken and fissures extending to the surface had developed. It was thought that in such a case the gas would short-circuit and pass out through these openings. Others believed that the method would be practicable, provided that most of these openings to the surface could be blanketed. Mr. Walsh pointed out that the best results would be obtained if some of the surface bleeders were allowed to remain open, as this would permit a freer circulation of the inert gases, which, when they came into contact with the heated rocks in proximity to the fire, would cool them off.

During the discussion it was pointed out that nineteen fires now exist in the anthracite region and that collectively they cost the coal companies as much as $10,000,000 per year. Discussion on this subject of mine fires was so lengthy that it extended into the afternoon session. After its conclusion P. C. Felton began discussion on "Safety Lamps."

On Saturday morning the conference met at 10 a.m. and Mr. Friel led the discussion on the subject of "What Is a Mine Within the Meaning and Intent of the Mining Law With an Abandoned Section Included?" Discussion on this subject was short, as the party left at 11 a.m. to visit the mine fire at a property of the Red Ash Coal Co., on the outskirts of Wilkes-Barre.

After viewing this veritable inferno, the party returned to the hotel and the conference ended. The inspectors went on record as favoring joint meetings with the operators' representatives in the future. This conference was a complete success. Such meetings furnish an excellent opportunity for the inspectors to become better acquainted with the operators and to demonstrate how they can co-operate with them. They also make it possible for the operators to gain an insight into the methods of the inspectors.

JAMES T. BEARD HAS BEEN ILL for several weeks. His many friends will be glad to know, however, that he is well on the road to recovery. It is expected that his departments will reappear in *Coal Age* next week.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THE year just closed marked in this country a turning point in the drastic reaction against inflation, according to the current issue of *The Guaranty Survey*. "The financial and commercial interrelations of nations," the *Survey* continues, "are so comprehensive and intricate that no country, however favorable its domestic conditions, can, in a worldwide readjustment, escape the ill effects of economic derangement elsewhere. Nevertheless, American business activity in general has been for some months gradually emerging from the trough of depression.

"The distinct improvement since mid-year in the fundamental elements of the business situation as a whole warrants a much more hopeful outlook for the coming year than was justifiable at the beginning of 1921.

"The most gratifying aspect of the year's industrial events is the upturn during the last few months in the general volume of production in the country, which about midsummer had reached its lowest point since 1914. Although some of the increase is clearly due to seasonal influences, there has been, nevertheless, since July, an upturn so pronounced that it must represent fundamental improvement.

"This upturn is most marked in the textile industry and less so in the iron and steel industry. . . . The large consumption of cotton, required by the increased activity of the textile industry, is particularly encouraging in view of its influence upon an important section of the country and the revised estimate of this year's cotton crop.

"Production in many other lines of manufacturing has also shown pronounced increase over the low points of the year. Especially is this true of manufactures of paper, lumber, tobacco, leather, and foodstuffs—meat, flour, sugar, etc. These increases in volume of production represent not merely seasonal advances but more substantial gains, indicating the fact that readjustment of industry, lower prices and costs of operation are producing the desired results."

Tire Production Increases

Production of tires continues to increase in the Akron factories, which are now working on spring stocks. More than 1,000 men have been added to the working forces of the Goodyear Tire & Rubber Co. in the last two weeks, and this number, according to semi-official reports, is one-third of that to be put on by Feb. 1. Production is exceeding 16,000 a day. The aeronautical department is working at capacity on government orders. The Firestone Tire & Rubber Co. has been lengthening hours and adding some men to the force. Sales costs have been cut 38 per cent and overhead expenses 58 per cent in 1921, according to announcement. Sales of the General Tire & Rubber Co. this year are unofficially reported to be about $6,000,000, compared with $5.755,000 for 1920. The Phoenix Rubber Co. proposes to start operations soon after the first of the year. The company was thrown into receivership by two large creditors. The International Harvester Co.'s Akron plant has been adding employees in the last few weeks, until it is estimated daily production will be forty tractors and five trucks early in January.

Unfilled U. S. Steel Orders Gain

That the unfilled orders of the United States Steel Corporation would show an increase for the month ending Dec. 31 if the average for the remainder of the month kept up to that established during the first twenty days, was announced Dec. 27. Factors in the expected increase are the smaller shipments from the mills of the company, excellent railroad orders and a fair export business.

Railways Plan More Improvements

Having started work on its cut-off bridge at Castleton, the New York Central R.R. expects to fulfill its plan, halted by the entrance of the United States into the World War, to spend more than $20,000,000 in improving its freight and passenger handling facilities at Albany, N. Y., by completely revamping the present track system. The world's greatest repair shops will be established at West Albany and the present equipment will be utilized and the new shops will provide employment for thousands of skilled machinists, carpenters, foundrymen and cabinet workers.

Directors of the Ontario & Western R.R. at their last regular monthly meeting approved the purchase of about $500,000 worth of new equipment to be delivered next spring. No new financing will be involved, as the company has sufficient cash on hand to cover the purchase.

The Great Northern Ry. will place orders for 3,500 cars as soon as its bond issue of $30,000,000 for general rehabilitation is authorized. The order will be for 1,000 stock cars, 1,000 box cars, 1,000 gondolas and 500 refrigerators.

Freight-Car Loadings Drop 15,923

Loading of revenue freight during the week ended Dec. 17 totaled 727,003 cars, compared with 742,926 the previous week, or a reduction of 15,923 cars, according to the American Railway Association. This was a reduction of 75,268 cars compared with the corresponding week last year and of 79,731 cars compared with the corresponding week in 1919. Coke loadings increased 507 cars within a week, bringing the total to 7,145. Coal loadings totaled 134,842 cars, 2,994 less than the week before and more than 90,000 cars below the corresponding week last year.

Idle freight cars on Dec. 15 totaled 531,337, an increase of 31,689 cars within a week.

Plant Resumes to Aid Industry

Iron and steel production was resumed at the Upson Nut Works of the Bourne-Fuller Co., Cleveland, Jan. 3 as an experiment toward improving industrial conditions. Eight hundred former employees were given work at a 15 per cent reduction in wages.

Sheet and Tin Company Speeds Up

The American Sheet & Tin Co., New Philadelphia, Ohio, had a total of nine sheet mills and one jobbing mill open Dec. 27. Operations were resumed on four additional sheet mills. Five of the sheet mills had been idle for several months.

Shipping Board Helps U. S. Coal Trade; Orders American Fuel for Bunkers

IN its annual report the U. S. Shipping Board says it has studied coal and statistics showing the relative rates on coal. The board has bid for control of commerce between this country and Central and South America, including coal exports. It does not plan to establish permanent coal depots in Europe, as coal can be purchased as cheap on the open market. Cargoes of coal shipped from the United States to Europe increased from December, 1920, to June, 1921, owing to the high price of British and Welsh coal. To increase shipment of coal from the United States, operators of Shipping Board vessels insisted upon American coal wherever it was available for bunker, in order to stimulate American coal production.

In Constantinople and Italian, Spanish and Portuguese ports American coal is obtainable for bunkerage. Shipping Board vessels bunkered in Northern Europe at Dunkirk with French coal. The board did not attempt to contract for coal on the Pacific coast, as its requirements for bunkering there are small. As only a small part of the fleet burns coal it was not necessary to establish an extensive system of coal bunkering stations. In certain trades, however, coal-burning vessels can be profitably operated, and to supply these coal bunker stations were established at Rio de Janeiro, with 25,000 tons approximate annual consumption; Buenos Ayres, 15,000 tons; Ponta del Gada, 20,000 tons, and St. Georges and St. Thomas, 18,000 tons each.

Alaska's 1921 Coal Output Is 78,000 Tons; Washery Completed at Matanuska

ALASKA'S output of coal during 1921 was about 78,000 tons, compared with 61,111 tons in 1920, according to preliminary estimates abstracted from the annual report on mineral resources and production in Alaska now being prepared under the direction of Alfred H. Brooks, of the U. S. Geological Survey. The estimates are believed to be within 5 per cent of the actual figures. In 1921 about 58,000 tons came from the Matanuska field, principally from the Eska mine, operated by the Alaskan Engineering Commission to supply coal for the railroad. The Navy Coal Commission continued underground exploration for coal at Chickaloon and at Coal and Moose creeks, with fairly encouraging results. The Eska mine, operated since 1917, was closed in October for the reason that there was a large stock of coal on hand. The Evans-Jones mine, near the Eska, is being systematically developed and now has a connection with the railroad. A washery for the Matanuska coal was about completed at the end of the year.

Work was suspended at the Bering River coal mine, in the Bering River field, in May, 1921. Though excellent coal has been found on this property, the underground explorations have not yet established the presence of a tonnage large enough to justify the construction of a railroad. Other leases have been granted in the Bering River field, and plans are under way for the building of a railroad to Controller Bay.

The Healy coal mine, in the Nenana lignite field, is now being operated on a regular productive basis. During the winter of 1920-21 some coal was mined on Lignite Creek, in the same field, by the Broad Pass Coal Co. Small lignite mines were operated at several widely scattered localities—two along the Alaska Railroad; one at Homer, Cook Inlet; one at Kugruk, Seward Peninsula, and one at Wainwright Inlet. It is probable that small quantities of coal were mined at other localities, from which no reports have yet come. In 1921 coal was produced at probably a dozen localities.

The most significant feature of the year's coal mining is that there are now two commercial mines, the Evans-Jones and the Healy, and these mines, though only small producers, will be operated throughout the year because they have railroad transportation. Both these mines are the result of local enterprise.

The question whether the deposits of high-grade bituminous coal in the Matanuska and Bering River fields contain a large tonnage of fuel available under the present high cost of recovery and with the present market is still unanswered. There is, however, no doubt that one or both these coal fields will be able to supply the local demand. Actual mining of the lower-grade of Matanuska coal has proved that it can be produced in competition with imported coal.

The Alaskan Engineering Commission has during four years of operation at the Eska mine made an output of nearly 200,000 tons of coal at a cost of about $1,150,000, or $5.60 a ton. This was used in the construction of the railroad. Had the government imported this coal, it would have cost nearly $3,000,000. This proves beyond doubt that commercial mining in at least part of the Matanuska field is feasible. Some have even gone so far as to assert that the Matanuska branch of the Alaska Railroad, which cost less than $2,500,000, has already proved a blunder. Such statements are without basis of fact, as shown by the record of mining in the Matanuska field.

British Empire Steel Corporation Will Reduce Wages of Its Coal Miners

A CRITICAL situation has developed in the coal fields of Nova Scotia, due to a disagreement between the British Empire Steel Corporation and its employees over the rate of wages. The present agreement expires Dec. 31, and on Dec. 19 a conference was held in Montreal between the officials of the British Empire Steel Corporation and the representatives of the United Mine Workers. The company proposed a reduction of 25 per cent in the rate which became effective on Jan. 1, 1921, or about 33 per cent on the rate now paid. The miners refused to accept the reduction and proposed a continuance of the present agreement until March 31 next, to which the company would not consent, and the conference terminated without any agreement having been reached.

Official notices have been posted at the mines of the company announcing that after Jan. 1 the wages paid will be at the rate which became effective Jan. 1, 1920, less 25 per cent, that the reduction is the only course which would enable the company to regain for its coal the markets lost during the war, and guarantee steadier work at the collieries. About 15,000 men are affected, including those employed by smaller operators, who will follow the example of the British Empire Steel Corporation. The miners will apply to the government for the appointment of a conciliation board under the Industrial Disputes Act.

Consider Counsel in Kohler Law Appeal

THE Board of Trade of Scranton, Pa., has named a committee to take up the subject of retaining counsel to appear in favor of the Kohler mine-cave act when consideration of the constitutionality of that law comes up before the Pennsylvania Supreme Court this month on an appeal from the decision of Judge Fuller in the case of Mahon vs. the Pennsylvania Coal Co. The Board of Trade suggests that it co-operate with the Surface Protective Association and the Citizens' General Mine Cave Committee.

Enclosed Within a Rule Border the *Wilkes-Barre Times Leader*, on Monday, Dec. 26, printed the probable program of the anthracite miners, saying that while the statements given were not official they were believed to represent the dominant sentiment. The *Times Leader* thinks the demands will be:

Wage increase of 35 or 40 per cent.
Uniform eight-hour day for all workers.
The check-off.
Abolition of the Board of Conciliation.

Wage Reduction Accepted in Alberta Mine.—At the Collie Mine, Drumhellar, Alta., 150 men belonging to the United Mine Workers of America have gone back to work at a wage reduction of 25 per cent. Secretary Peacock says that the return to work after notice of reduction does not mean an acceptance of the lowered wage.

Chicago Is the World's Greatest Coal Market

Coal Selling Companies of That City Sell One-Fifth of Coal Produced in United States—Chicago Switching District Consumes More Coal Than All New England States

By F. C. Honnold*

COAL selling concerns, producers and wholesalers located in the city of Chicago sell approximately one-fifth of the total coal production of the United States. The extent of the Chicago market is perhaps most accurately shown by the statistics of the Fuel Administration. During the coal year from April 1, 1918, to March 31, 1919, the producing and wholesale companies having headquarters in that city handled through previously established and existing agencies the distribution of something more than 20 per cent of the total coal production of the United States for that year. The reason for the slightly larger than normal distribution during that twelve-months period was the abnormally large provision of railroad fuel coal.

There are approximately 125 producing concerns operating mines in 10 states that have their headquarters and general sales offices in Chicago. There are 100 wholesale concerns in the city selling the product of producing coal companies from all sections of the United States. The total number of coal-selling concerns in Chicago is estimated to be three times as great as that of any other coal market in the world.

Within the Chicago switching district alone more coal is consumed annually than is consumed in all of the New England States. More coal also is consumed in the switching district of Chicago than in all of New York State, including Greater New York.

According to the statistical data of the U. S. Fuel Administration covering the one-year period April 1, 1918, to March 31, 1919, during which time there was maximum coal movement from all mines and fields throughout the country, it is shown that the following amount of bituminous and anthracite coal, in net tons, moved into:

	Tons
New York	21,116,000
Ne England	20,680,000
Total	41,796,000
Anthracite (into both these markets)	23,000,000
Grand total	64,796,000

The division of the above tonnage of anthracite is about equal as between New York State and New England

Chicago coal consumption, however, is only about one-third of the total tonnage sold by Chicago concerns. From Illinois and Indiana alone the average coal production for the last five years has been about 105,000,000 tons. Approximately 65 per cent of this tonnage is sold by coal-producing or wholesale concerns located in the city of Chicago—68,500,000 tons.

In addition to this there is an average of 7,500,000 tons of coal originating in various Eastern fields sold by representatives in Chicago for movement all rail to points outside of Chicago — Southwest, West and Northwest — the greater bulk of this coal going into Michigan, Wisconsin Iowa and Illinois. There also is about 1,500,000 tons of coal from Virginia, central Pennsylvania, western Kentucky and Arkansas as well as other remote districts, that is sold by various producing Chicago concerns who act as representatives in this market for general Western distribution. Besides general steam use, much of this coal is for special application—metallurgy, chemical, smithing, etc.

There are seventeen concerns in Chicago that sell on an average 46,000,000 tons of coal per annum. The bulk of the coal they sell originates in Illinois and Indiana, but of the seventeen companies, three operate mines in several other states and sell, from their Chicago headquarters, the entire production of these remote mines so operated. Coal originating in other fields than Illinois and Indiana and distributed by the foregoing and various other, smaller, sales concerns located in Chicago, for movement to Eastern, Western and Southern markets as well as coal for bunkerage and export totals about 10,000,000 tons per year.

The quantity of coke orginating in other sections and sold by Chicago concerns in Chicago and other Western and Northwest districts is variously estimated at from 2,500,000 to 3,000,000 tons per annum. These figures, however, are minimum. No satisfactory statistical information is available on coke. There is a substantial quantity of Eastern coal reaching this market that is made into byproduct and metallurgical coke and mostly used by the industries originally receiving the coal. No account is taken of such coke in this statement. Neither is any account taken herein of the volume of gas-house coke distributed throughout the Central Western states in determining the volume of the Chicago market, since the coal from which such coke was made is shown in the general movement from Eastern and local fields.

It is not surprising that Chicago is the largest coal market in the world. It is made so by the wide variety and great range of origin of coal sold in and through this market to an enormous manufacturing area reaching 400 miles up and down the Mississippi-Missouri River valley. Taking

COAL CONSUMPTION, CHICAGO SWITCHING DISTRICT

For year ending March 31	1914	1915	1916	1917	1918	1919
Illinois	10,745,172	8,358,836	9,963,231	11,722,911	16,311,236	16,133,737
Indiana	4,380,096	3,496,606	5,027,305	5,667,962	5,509,442	6,896,780
Totals	15,125,268	11,855,442	14,990,536	17,390,873	21,820,678	23,030,517
Ohio	324,003	273,247	285,292	†148,825	‡6,500,000	‡5,500,000
Pittsburgh	207,285	128,875	52,108	†98,270		
East Kentucky and Tennessee	760,108	1,738,915	2,513,403	†1,761,934		
West Virginia (splint and gas)	486,443	463,162	603,741	†542,799		
Smokeless (Pocahontas)	4,500,159	5,389,819	5,941,830	†4,933,748		
Eastern Coal by boat (Bit.)	590,396	973,429	973,038	†800,577		
Miscellaneous	†200,000	‡250,000	‡300,000	‡600,000	‡750,000	‡500,000
Totals	7,068,394	9,217,447	10,669,412	8,886,153	7,250,000	6,000,000
Anthracite (all rail)	‡700,000	‡680,000	‡590,000	‡600,000	‡875,000	‡800,000
Anthracite (by boat)	852,081	831,761	679,998	635,465	875,000	800,000
Totals	1,552,081	1,511,761	1,269,998	1,235,465	1,750,000	1,600,000
Coke (estimated—see text)	....	....	....	....	....	2,500,000
Grand totals	23,745,743	22,584,650	26,929,946	27,512,491	30,820,678	33,130,517

† Eleven months only.

‡ Estimated; no exact figures available since 1917 on Eastern and miscellaneous bituminous coals which were zoned out of this district during the war period and came through in limited amounts only on special permit. It is probable that the approximate normal movement of these coals into Chicago will now equal the 4-year average of 1914 to 1917 as a minimum, or about 9,000,000 tons per annum. A correct estimate of total Chicago coal consumption would therefore be, for present normal years, 36,000,000 tons.

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*Secretary-treasurer, Illinois Coal Operators Association, Chicago.

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NORTH CENTRAL WESTERN STATES MANUFACTURERS

	Chicago	Illinois, Including Chicago	Indiana	Wisconsin	Missouri	Iowa	Total
Population	2,701,705	6,485,280	2,930,390	2,632,067	3,404,055	2,404,021	17,855,813
Number manufacturing establishments	10,538	18,594	7,918	10,394	8,593	5,683	51,182
Persons engaged therein	502,303	805,008	277,600	80,500	195,900	80,500	1,439,508
Materials used	$2,80,025,000	$3,489,054,000	$1,335,851,000	$1,372,723,000	$939,691,000	$403,206,000	$7,540,525,000
Value of product	$3,658,740,000	$5,426,652,000	$1,901,846,000	$1,883,608,000	$1,599,264,000	$741,473,000	$11,552,843,000

only the five major states into which Chicago coal concerns move the great majority of coal used, a few figures given in the accompanying table, taken from the last general United States census, will indicate the tremendous industrial consumption potential.

It also should be borne in mind that approximately 25 per cent of the total bituminous coal used for household consumption in the United States is produced by Illinois mines. This is due to the growing restriction of anthracite distribution to markets nearest to the anthracite mines and to the further fact that many Illinois coal operators several years ago adopted a precise duplication of anthracite prepared sizes and have through widespread publicity educated the public through the West in the use of proper equipment to obtain maximum fuel values and minimum inconvenience from bituminous coal used for household and allied purposes.

Chief among other prime reasons for the pre-eminence of Chicago as a coal market is its central location and the extraordinary radiation of transportation facilities. Forty per cent of the railway mileage in the United States terminates in Chicago; 1,400 miles of belt lines—one-third of the belt line mileage in the United States—encircles Chicago; 39 steam railroads are located or centered in Chicago. Of the latter roads twenty-four are trunk lines, seven of whose total freight traffic is 50 per cent coal tonnage.

Illinois Mine Workers' Earnings

In the subjoined tables are shown the earnings during the two-weeks period Oct. 16-31, 1921, of workers in 96 Illinois coal mines employing 38,451 men producing a tonnage of 1,690,223. This is approximately 26 per cent of the mines; 45 per cent of the miners and 46 per cent of the total tonnage of the state for the period here shown. The mines included in this showing are located in all parts of the state and operate in coal seams ranging in thickness from 36 in. to 9 ft. The data, from members of the Illinois Coal Operators' Association, were compiled by F. C. Honnold.

There are three coal operators' associations in Illinois, operating a total of 373 shipping mines. The Illinois Coal Operators Association is the largest, having 179 mines, located in all parts of the state and producing normally about 58 per cent of the total tonnage of the state. The Coal Operators Association of the 5th and 9th District has 158 mines, all located within an average distance of 30-35 miles of East St. Louis, and produces about 31 per cent of the tonnage. The Central Illinois Coal Operators Association has 36 mines and produces about 11 per cent of the tonnage.

EARNINGS FOR TWO-WEEKS PERIOD

	Northern Illinois	Danville	Fulton-Peoria	Springfield	Centralia	Du Quoin	—Southern Franklin	Illinois Williamson	Counties— Saline	State Totals and Averages
1. Number of mines	8	5	13	10	3	5	23	17	12	96
2. Av. work time (days)	7.5	9.6	9.7	9.3	9.7	11.6	7.9	10.6	11.	9.5
3. Tonnage	51,072	28,305	108,558	113,630	65,463	105,023	630,407	328,027	259,840	1,690,323
4. Total employees	2,856	541	2,574	2,995	1,390	1,746	14,626	6,460	5,263	38,451
5. Av. daily number all employees working at these mines	2,491	541	2,357	2,699	1,300	1,602	12,234	5,989	4,496	33,709
6. Number earning $50 or more in 2-week pay period	1,027	461	2,156	2,467	1,255	1,546	12,014	5,468	4,391	30,785
7. Av. earnings Group 6 2-week period	$72.24	$86.04	$89.48	$81.55	$73.15	$104.03	$93.23	$101.02	$96.24	$92.76
8. Percentage (Group 6) to av. number working daily (Group 5)	41.2	85	91.4	91.4	96.5	96.4	98.2	91.3	97.7	91.3
9. Percentage of total payroll paid to those making $50 or over	54.3	94.5	88.8	88.4	78.5	93.4	91.7	92.9	92.8	89.6
10. Number of men on payroll in excess daily average working (excluding mine office)	322	...	177	7.5	81	116	2,139	318	655	4,027
11. Percent absenteeism	11.4		6.9	219	5.8	6.8	14.9	5	12.7	10.7
12. Occupational deduction	$483.37	$524.23	$10,710.75	$5,978.00	$3,194.21	$5,607.45	$26,558.25	$20,017.[illegible]	$8,477.51	$81,550.99
Per capita	.172	.971	4.22	1.048	2.313	3.264	1.847	3.173	1.645	2.[illegible]
13. Check-off for miners' union dues and assessments	$1,327.19	$583.31	$4,974.43	$4,203.25	$3,465.00	$3,805.95	$36,807.79	$16,080.37	$12,976.96	$84,224.25
Per capita	.472	1.08	1.963	1.40	2.51	2.215	2.561	2.549	2.519	2.23
14. Av. deductions per ton:										
Occupational	.009	0.18	.098	.053	.048	.053	.042	.061	.032	.0497
Union dues	.026	.02	.045	.037	.053	.036	.058	.049	.049	.0514
Total	.035	.038	.143	.09	.101	.089	.10	.11	.081	.1011

AVERAGE DAILY EARNINGS BY CLASSIFICATIONS

	Northern Illinois	Danville	Fulton-Peoria	Springfield	Centralia	Du Quoin	—Southern Franklin	Illinois Williamson	Counties— Saline	State Totals and Averages
Machine Runners:										
Number of men	...	11	140	130	60	94	788	268	269	1,760
Av. earnings for the pay-period	...	$92.33	$121.44	$89.07	$89.54	$132.07	$105.07	$114.00	$120.45	$109.72
Av. for days mines hoisted coal	.	9.62	12.52	9.18	9.23	11.38	13.30	10.75	10.95	11.55
Av. based on every working day in 2 week period (13 days)	.	7.10	9.34	6.85	6.89	10.16	8.08	8.77	9.27	8.44
Loaders:										
Number of men	464	125	1,270	1,407	750	823	5,994	3,091	2,445	16,369
Av. earnings for the pay-period	$59.52	$67.99	$87.87	$80.45	$68.07	$105.66	$90.14	$101.56	$94.56	$90.63
Av. for days mine hoisted coal	7.93	7.08	9.06	8.29	7.02	9.11	11.41	9.58	8.56	9.54
Av. based on every working day in 2 week period (13 days)	4.57	7.10	9.34	6.19	5.24	8.13	6.93	7.81	7.25	6.97
Aver. tonnage of loaders for days mine worked	3.91	6.06	7.90	8.16	9.02	9.9	13.1	9.00	9.28	9.36
Day Men:										
Number of men	563	325	746	930	445	629	5,232	2,109	1,677	12,656
Av. earnings for the pay-period	$82.72	$92.78	$86.24	$82.16	$79.49	$97.72	$95.00	$98.57	$ 95.31	$93.17
Av. for days mine hoisted coal	11.03	9.66	8.89	8.47	8.19	8.42	12.03	9.30	8.67	9.[illegible]
Av. based on every working day in 2 week period (13 days)	6.36	7.14	6.63	6.32	6.11	7.52	7.31	7.[illegible]	7.33	7.17
Total (all classifications):										
Number of men	1,027	461	2,156	2,467	1,255	1,546	12,014	5,468	4,391	30,785
Number of mines	8	5	13	11	3	5	23	17	12	96
Av. days mines worked	7.5	9.6	9.7	9.3	9.7	11.6	7.9	10.6	.11	9.5
Av. earnings for the pay-period	$72.24	$86.04	$89.48	$81.55	$73.15	$104.03	$93.23	$101.02	$96.24	$92.76
Av. for days mines hoisted coal	9.63	8.96	9.23	8.77	7.54	8.97	11.80	9.53	8.75	9.76
Av. based on every working day in 2 week period (13 days)	5.55	6.62	6.88	6.27	5.63	8.00	7.17	7.77	7.40	7.14

Coal-Cutting Machines Increased in Use In the United Kingdom in 1920

THAT the mining machine is gaining in favor in the United Kingdom is shown by Part II of the General Report of Mines and Quarries for 1920. The total number of mining machines of all types in use at the close of that year was 5,073 as against 4,482 in 1919. Indications are that as the advantages to be derived from machine mining become more clearly recognized by our British cousins the employment of such machines will increase still further.

English coal cutters differ somewhat in type from those employed in this country. In addition to the percussive (puncher) and the chain types, both of which are common in this country, the English use the so-called disk and bar machines. The disk machine is not dissimilar to our longwall chain machine except that the cutter bar is replaced with a disk or wheel bearing cutter bits upon its circumference—practically a circular saw of wide set. The bar machine in appearance and principle of operation resembles the Hess dustless machine. In this device the cutter bar of the longwall chain machine is replaced by a revolving shaft or bar carrying not only cutter bits but also a helical fin, the purpose of which is the removal of the bugdust, or "holings," as this material is termed in Britain.

In the accompanying illustrations, both of which are taken from the *Iron and Coal Trades Review*, Fig. 1 shows graphically the rate of increase in the use of coal-mining machines covering the years 1910 to 1920 inclusive. From these graphs it will be noted that punchers and chain machines are gaining in favor more rapidly than are the other types.

Fig. 2 shows not only the number of tons of coal produced by the electric and compressed-air machines but also the percentage of the total production obtained by the use of these machines. The accompanying table shows the actual figures of coal production and machines used throughout the various districts of the United Kingdom as well as the number of conveyors employed at the coal face.

In every instance both in the graphs and the table the tons mentioned are, of course, long tons of 2,240 lb. each. The production given does not represent the entire work of the machines because in addition to the coal mined by them they also produced 497,615 tons of ironstone, 50,160 tons of fireclay, and 4,198 tons of ganister.

FIG. 1

Machines in Use

A steady increase in the use of mechanical cutters of all types is shown for the eleven years, 1910 to 1920 inclusive.

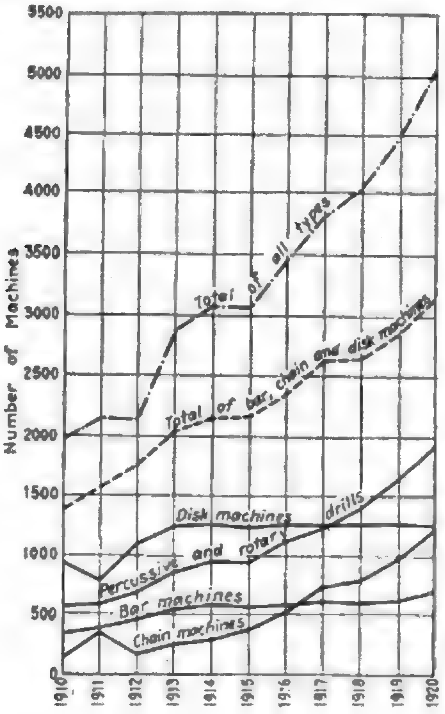
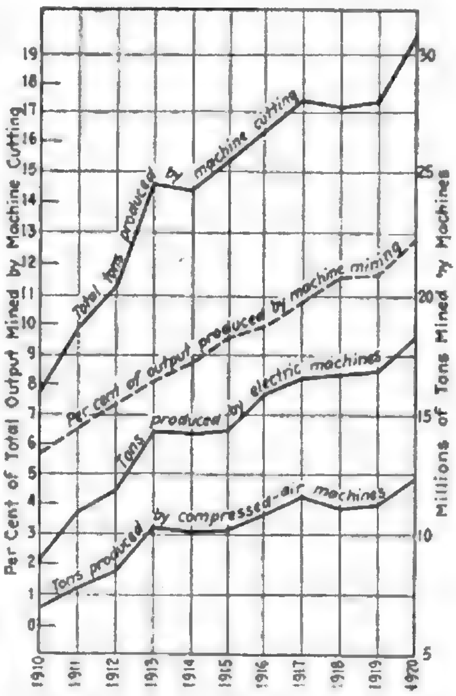


FIG. 2

Coal Cut by Machines

In this graph are shown the production by mechanical cutters in millions of tons and the percentage of the total so produced.



MECHANICAL COAL CUTTERS EMPLOYED IN THE UNITED KINGDOM IN 1920

Type of Machine	District												Totals	
	Scotland		Northern		York and North Midland		Lancashire, North Wales and Ireland		South Wales		Midland and Southern			
Electrically Driven	No. Mach.	Tons Coal Produced	No. Mach	Tons Coal Produced	No. Mach.	Tons Coal Produced	No. Mach.	Tons Coal Produced	No. Mach.	Tons Coal Produced	No. Mach.	Tons Coal Produced	No. Mach.	Tons Coal Produced
Disk	631	6,249,247	51	445,346	156	1,209,009	8	39,480	2	20,500	23	268,947	871	8,252,529
Bar	366	2,531,908	29	161,025	78	735,869	33	213,970	26	100,199	18	106,584	550	3,849,555
Chain	151	1,158,325	135	1,207,517	232	2,043,803	28	150,915	44	223,368	132	965,568	722	5,749,469
Percussive	....	....	....	....	...	....	...	....	...	....	1	375	1	375
Rotary heading	1	331	....	....	8	3,316	...	....	...	....	1	....	10	3,647
Totals	1,149	9,939,811	215	1,813,888	474	3,991,997	69	424,365	72	344,067	175	1,341,474	2,154	17,855,575
Compressed-Air Driven														
Disk	93	670,261	47	348,125	119	1,064,047	109	613,017	2	8,416	13	106,584	383	2,810,450
Bar	3	14,450	23	175,476	31	441,557	61	417,747	14	46,750	12	75,071	144	1,959,609
Chain	5	44,354	44	336,690	168	1,995,873	82	599,051	101	611,458	92	749,407	492	4,336,833
Percussive	30	41,584	924	2,511,876	193	288,103	546	878,234	50	65,839	138	186,332	1,881	3,971,968
Rotary heading	....	....	4	400	3	11,832	10	4,300	...	....	2	486	19	17,018
Totals	131	770,649	1,042	3,372,567	514	3,801,412	808	2,512,349	167	732,463	257	1,117,880	2,919	13,095,878
Grand totals	1,280	8,710,460	1,257	5,186,455	988	7,793,409	877	2,936,714	239	1,076,530	432	2,459,354	5,073	30,951,453
No. of machines used in 1919		1,189		1,025		880		795		182		411		4,482
Per cent of increase		7.66		22.6		12.3		10.3		31.3		5.1		13.2
No. of collieries using machines		252		126		137		103		65		77		760*
No. coal face conveyors in use		109		99		191		53		329		32		823†

* In 1919 729 collieries used mining machines. † In 1919 712 face conveyors were in use.

Three Central Competitive Region Associations Refuse To Make April Bargain; One Denounces Check-off

THE Southern Ohio Coal Exchange, which is composed of operators in the Hocking Valley, Jackson and Pomeroy fields, has notified the Ohio organization of mine workers that it will not co-operate with the four competitive states in negotiating a renewal of the wage agreement at its expiration April 1, 1922. The announcement was a sort of bombshell in the camp of the United Mine Workers of America and is the opening of a fight to treat with the miners in the various producing districts separately. Another significant point is the announcement that the Southern Ohio Coal Exchange will not agree to the check-off in the coming wage agreement.

The letter written to the mine workers' organization was in answer to a letter received from John L. Lewis, president of the organization, inviting southern Ohio operators to send representatives to a meeting Jan. 6 at Pittsburgh as a preliminary to negotiating a wage scale. The main points in the letter were:

"The plan of scale-making or wage-fixing employed in the past has contributed seriously to the existing state of extreme poverty and business depression throughout the mining districts of southern Ohio. To reach our natural markets, serve the public efficiently and economically and relieve conditions that are destroying mining communities, the mining industry and the earning power of miners, the operators of southern Ohio feel that it is incumbent upon them to notify you now that they cannot meet with you as heretofore.

"In due time the operators of southern Ohio will propose a new scale for their employees which will not include the check-off and which will eliminate the inequalities placed upon the district."

Pittsburgh and Eastern Ohio Refuse to Attend

The action of the operators centering around Pittsburgh was quite similar to that taken by those of southern Ohio. In reply to Mr. Lewis' letter to O. A. Blackburn, president of the Pittsburgh Coal Producers' Association, the commissioner of that organization, R. W. Gardiner, addressed a letter to J. L. Lewis, saying that "we see nothing beneficial to the public or the coal industry in a meeting such as indicated in your letter, and decline to meet."

Northeastern or, as it is known, "Eastern" Ohio, at least that part of it represented by the Pittsburgh Vein Operators Association, is against holding the meeting. That association passed a resolution Dec. 31 declining to meet with the officials of the United Mine Workers. The resolution adopted reads: "Resolved that in view of the situation which has developed we feel that nothing can be accomplished by a meeting at the William Penn Hotel in Pittsburgh on Jan. 6, 1922, and we therefore decline to send a representative to meet with the miners at that time and place." This section of the field embraces 170 mines employing 15,000 miners.

Illinois operators have notified Mr. Lewis that they will attend the contemplated meeting if it can be arranged and will be represented by Rice Miller and W. K. Kavanagh. However, while they are ready to enter into conference with the United Mine Workers they do not regard that compliance as expressing an intention of making an agreement with the organization. Indiana takes the same position.

The Old Ben Corporation, which takes a leading part in the Illinois coal trade and has some of the largest mines in Franklin County, has addressed a letter to its employees containing the following observations:

"We want to see the union survive, so long as it keeps conservative and competitively in line on wages, so that 'Old Ben' coal can be sold in the broadest possible markets and enable us to give you steady work so that we both will benefit. Neither you nor your union can survive without work. We both know that.

"With your co-operation we can meet every problem that confronts us and can increase our working time into a well-balanced and satisfactory condition. Unless, however, you sit down with us at the proper time and in the best and frankest good fellowship help us work out a wage understanding that will be just, fair and profitable, we cannot expect any better working conditions than the unsatisfactory ones that now exist. Public opinion, world conditions and the old, old law of supply and demand are strongly arrayed against a continuance of the present cost of producing a ton of coal at Illinois mines."

Men in New River Petition for Lower Wage

THE United Mine Workers of America is losing ground rapidly in District 29, which embraces the New River field of West Virginia, and the new year finds the officers of the district making a desperate struggle to maintain their organization. Some defections have occurred in District 17, the larger of the two districts in the state, but nothing like that sustained in District 29, where the check-off has never been popular. The first of the year finds additional mines in the New River field resuming operations under the open shop.

The open-shop movement in the New River field has gained momentum not through any overtures or negotiations made by the operators but upon the initiative of the miners, such initiative invariably taking the form of petitions. The mine workers are willing to return to work at the scale prevailing prior to the adoption of what is known as the September, 1919, agreement. Owing to the lack of orders resumption has not always been possible, however,

In Raleigh County just before the holidays a peculiar difficulty arose. At the Wickham mine, of the Beckley Slope Coal Co., 150 men signed a petition expressing their willingness to return to work under the open-shop plan, and on that basis the mine was reopened on Dec. 19, 125 miners going to work. They elected their own weighman. A. C. McRoberts, who had filled the position when the mine was operated under a union agreement, asserted that he was entitled to retain it and carried his contention to the Circuit Court. The judge issued a temporary injunction restraining the company from interfering with his work.

Mines at Eccles, Cranberry, Skelton, Mabscott and other points are planning to resume operations early in the year on an open-shop basis.

Anthracite Miners Busily Writing Scales; One Scale Asks 60 Per Cent Increase

ENOCH WILLIAMS, who is secretary of District No. 1 of the United Mine Workers, has seventeen resolutions to be presented at the convention of Districts 1, 7, and 9 at Shamokin, Pa., Jan. 17. These are the three anthracite sections. The resolutions voice the desire of the mine workers to get increased pay, but one resolution wants the mine workers to go on strike if negotiations have not resulted in a contract by April 1.

District 1 presents a demand of $8 a day for the contract miner and a flat increase which would range from 20 to 40 per cent on present wages. Another resolution calls for the adoption of seniority rules at all collieries. Resolution No. 3 demands that all refuse be paid for at the adopted rate for coal and that the general grievance committees of the large coal companies be recognized. The board of conciliation must also be abolished.

The fourth resolution has no less than fifteen demands: An entire new wage scale arrangement untrammelled by references, such as now exist, to past scales dating back to 1902; the weighing of coal, 35c. per inch for all refuse, $7.50 for consideration miners, $6 per shift for laborers and a 20-per cent increase for inside and outside company hands; also a six-hour day.

Resolution No. 5 also bans the linked-up scales of past years, but the proposers would nevertheless couple the past with the present by a 60-per cent increase. It would have the price of coal to the mine worker cut $1.25, would have the company pay men when they are laid idle for lack of supplies and would establish the six-hour day, in contradistinction to Resolution No. 9, which demands an all-around eight-hour day.

Abolition of docking for refuse is demanded in Resolution No. 10. Resolution No. 11 forbids miners to mine more than one shift a day or to mine coal on Sunday. The next resolution demands a 40-per cent increase in wages and a seven-hour working day. Another resolution requires the brakeman to linger around when repairs are made on locomotives, so that, it is speciously remarked, he may be aware of the condition of the same. Another demand is for the weekly pay day. The sixteenth resolution would give motormen $8 a day, motor brakemen $7 per day, all company hands $6.50 and track layers $7.

McVann, Retiring Secretary of Smokeless Association, Delivers Valedictory

ON RETIRING as secretary of the Smokeless Coal Operators' Association, Dec. 31, E. J. McVann sent the following "valedictory" to the membership of that association:

"Today marks the end of my service as secretary of the association. Before the hour of termination strikes it seems proper and fitting that I should express to those who have been my employers and associates during the past four strenuous years the feeling that I have about that employment and those associations.

"The years of my connection with the association, through the Washington Committee and the secretaryship, have added much to my experience and store of information about men and affairs and to my acquaintance in the coal industry. But valuable as all this is, I do not prize it so highly as the friendships I have made through my association with you. I cherish those friendships, and my earnest wish is that every one of them will survive the termination of my official connection and grow with the passage of the years.

"My new office will be in Suite 618, Munsey Building. Each and every member of the association will be welcome there at any time. May the new year bring you all the rich rewards that every good Smokeless man deserves."

Expect to Show That 50c. of Each Dollar Paid for Coal Represents Freight

TRAFFIC men throughout the United States are now concentrating on matters pertaining to the Interstate Commerce Commission's hearing which is expected to result in important reductions in rates. Opinion is crystallizing among them and there is a general feeling that the commission is certain to confine the larger reductions to the heavy, low-class commodities. It is not believed that material reductions will be ordered on high-class freight. The view is generally held that the reduction on the heavy commodities will not be less than the reductions made on grain, which averaged 16 per cent.

Practically the entire argument for the bituminous industry, which will be made by J. D. A. Morrow, will be predicated upon statistical data which are now being gathered. It is the intention to subdivide the dollar which the consumer pays for coal for the purpose of indicating its distribution. It is believed that the figures now being gathered will show that very little of the dollar is going to operators as profit and that more than 50c. of each dollar is going for transportation charges. Those portions of the dollar that go for labor, for materials and for other purposes will be set forth with fully authenticated figures to sustain them. Particular attention will be paid to the analysis of freight charges. An effort will be made to show in a more comprehensive manner than ever before just what the freight-rate factor means to the consumer of coal. This analysis will include figures as to the freight the mine operator has to pay on supplies and materials which he must bring to his operation.

Utility Coal Consumption in November 40,000 Tons More Than in October

COAL for public utilities represents the one shining example of a steady market for the coal man in these troublesome days. According to figures published by the Geological Survey, central power stations consumed 2,795,235 tons of coal in November, a gain of 40,000 tons over October and more than 200,000 over September. Fuel oil consumed by central stations decreased slightly, from 1,187,113 bbl. in October to 1,172,400 bbl. in November. Gas used decreased from 2,293,152 M. in October to 2,084,838 M. in November.

Power developed by fuels and water power made the usual seasonal increase, the average daily output of 121,500,000 kw.-hr. in November representing an increase of 6,100,000 kw.-hr. over October and 16,200,000 kw.-hr. over May, 1921.

The amount of coal consumed by electric public utilities in November was nearly 6½ per cent of the total production of coal in the United States in the same month. It would have required an additional daily consumption of about 56,000 tons of coal to generate the electricity produced by water power during November.

COAL CONSUMED BY PUBLIC UTILITY PLANTS, AUGUST-NOVEMBER 1921
(In net tons)

State	August	September	October	November
Alabama	23,462	31,357	28,023	22,409
Arizona	......	......	......	......
Arkansas	9,568	9,356	9,446	9,440
California	......	......	......	......
Colorado	28,974	28,254	35,910	36,918
Connecticut	60,095	62,974	67,215	64,528
Delaware	6,577	6,924	7,578	7,845
District of Columbia	19,120	18,547	19,163	19,392
Florida	1,748	1,826	1,898	1,924
Georgia	6,020	11,222	15,433	12,165
Idaho	......	......	......	......
Illinois	326,548	318,630	335,655	359,507
Indiana	152,095	151,754	161,547	167,890
Iowa	67,045	68,674	71,792	77,959
Kansas	17,322	15,847	19,188	19,795
Kentucky	38,842	38,724	41,239	41,668
Louisiana	10,431	10,401	9,844	9,772
Maine	779	3,315	4,354	2,104
Maryland	26,958	30,788	32,194	20,556
Massachusetts	107,921	118,801	120,816	115,964
Michigan	123,617	118,009	120,040	117,425
Minnesota	47,825	42,696	48,429	54,394
Mississippi	8,475	9,294	9,615	9,262
Missouri	82,288	81,251	86,216	96,081
Montana	3,476	3,650	3,610	3,707
Nebraska	36,038	35,936	36,039	35,800
Nevada	153	138	134	135
New Hampshire	3,473	4,983	5,200	4,367
New Jersey	93,356	93,302	100,344	108,425
New Mexico	2,678	3,359	2,785	2,582
New York	365,776	373,813	390,010	379,776
North Carolina	8,031	15,295	16,537	16,941
North Dakota	14,336	12,973	13,581	15,472
Ohio	249,812	235,397	263,460	285,526
Oklahoma	3,474	3,300	3,665	3,697
Oregon		140	135	135
Pennsylvania	365,275	362,057	393,185	399,821
Rhode Island	7,870	8,685	10,911	11,495
South Carolina	7,874	9,699	10,601	9,726
South Dakota	7,518	7,265	7,581	7,771
Tennessee	20,263	20,245	22,686	21,620
Texas	19,185	17,718	18,497	18,262
Utah	......	......	......	......
Vermont	336	1,815	596	106
Virginia	48,315	50,007	53,717	44,882
Washington	2,287	2,340	2,355	1,912
West Virginia	79,549	83,633	87,657	87,491
Wisconsin	60,803	54,365	58,684	60,473
Wyoming	6,981	7,274	7,839	8,115
Totals	2,572,569	2,586,033	2,755,404	2,795,235

Coal Consumed by Railroads in September

COAL consumed by Class 1 railroads in road service in October, as reported by the Bureau of Statistics of the Interstate Commerce Commission, amounted to 9,489,979 net tons, compared with 10,866,978 in October, 1920. These figures include an equivalent coal tonnage for fuel oil consumed.

In the ten months ended with October these 164 companies consumed 83,311,863 tons of coal in 1921, compared with 101,642,402 tons in 1920, a decrease of about 18,330,000 tons, or 18 per cent. In the same periods the net revenue and non-revenue freight ton miles decreased from 377,000 million to 289,000 million, a drop of 24 per cent, and passenger business, expressed in passenger-train car miles, declined 3 per cent.

Senate Committee Holds Hearing on Proposed Oil Duty; American Producers Ask Tax, Railroads Oppose

HEARINGS to proponents and opponents of a duty on imported petroleum and products were given by the Senate Committee on Finance Thursday, Dec. 29, in considering the tariff revision bill, during which discussion was had as to the effect on coal of oil burning on vessels and in industries.

Oil producers from the mid-continent and other fields favored an oil duty ranging from $1 per barrel to a countervailing duty to equalize import and export rates imposed by foreign countries. Representatives of Southwestern railroads opposed the duty on the ground that Mexican oil was required because domestic supplies were not sufficient and that it had been found that oil was a cheaper locomotive fuel than coal.

The effect of the oil duty on the merchant marine was feared by Senators on the committee who pointed out that coal-burning ships could not compete with foreign ships using oil, as fuel oil was declared to be 40 per cent cheaper than coal as a fuel for vessel operation.

Senator Watson, of Indiana, pointed out that American shipping burning coal could not compete with foreign ships using oil as a fuel. He said that it was 40 per cent cheaper to operate ships by fuel oil than by coal.

W. H. Gray, of the National Association of Independent Oil Producers, favored giving the coal men a little protection, as he did not believe in shutting down coal mines in order to afford a market in the United States for oil from Mexico and Colombia.

"Is there any danger of that?" queried Senator Watson.

"There is," replied Mr. Gray, who said the use of oil as a fuel had affected coal mines; in some localities railroads operating through coal fields burned oil for fuel.

RAIL MEN FEAR DUTY WOULD SHUT OUT MEXICAN OIL

A. P. Thomson, of the railway executives, read a statement prepared by the general counsel of the Missouri, Kansas & Texas R.R. opposing an oil duty on the ground that it would shut out Mexican oil, which was needed for operation of railroads in the Southwest and on the Pacific Coast because sufficient contracts could not be entered into for long periods with American producers. The statement said that oil could be burned more economically in railroad operation than coal and that due to failure to secure supplies from the mid-continent fields at stated periods coal-burning locomotives which had been turned into oil burners had been reconverted back to coal burners.

It was further asserted in the statement that if the Southwestern roads had to rely on domestic oil they would be forced to return to coal, and as most of the lines were distant from coal mines it would require a long haul of the coal from the mines. It was said that the high price of coal had caused the use of oil on Southwestern and Pacific coast roads. Two thousand locomotives were equipped as oil burners and it would require $80,000,000 to convert them to coal burners. Additional locomotives and extra coaling stations costing $35,000,000 also would be required and the increasing cost of coal over oil and the greater cost of transporting coal over oil would mean an increased outlay of $34,000,000 annually by the roads. The loss on oil equipment due to conversion to coal would be $9,000,000. A restriction on Mexican oil imports would force the roads to return to coal burning.

Senator Curtis, of Kansas, proponent of an oil duty, replied that the Southwestern roads ran through oil fields of Kansas and Oklahoma, in which there was sufficient oil for railroad use during the period complained of. He said the roads objected to the duty because they had long-time oil contracts in Mexico. Senator Harreld, of Oklahoma, also an oil duty advocate, said the Southwestern roads produced oil through subsidiary companies and that the lower cost of oil as compared with coal and the increasing cost of coal had caused an increased use of oil by railroads.

In opposing the oil duty on behalf of the copper producers of the Southwest, D. A. Welch, of New York, said that the copper producers consumed 4,500,000 barrels of fuel oil a year and that coal was not now developed in sufficient quantity and suitable quality to meet the present demands of the copper producers. Oil produces a superior grade of copper than that which has been refined using coal as a fuel, he said.

British Sell Coal at Loss to Operate at Capacity; Americans to Compete

THAT British coal operators are selling their product at less than cost was an opinion expressed on Dec. 29 by Commerce Secretary Hoover. His information is that the British operators are willing to take these losses in an effort to increase their sales to the point where their mines can be operated at maximum capacity. Even so there would be a profit in the price they now are receiving for their coal, as conditions at British mines are peculiarly susceptible to the economies which come with quantity production.

Mr. Hoover stated further that the British are continuing to capture business in the West Indies, but that no plan has been evolved as yet to meet this competition. He stated that American coal producers have expressed perfect willingness to go as far as the British in selling coal below cost in an effort to hold this trade, but that more than the operators' profit has to be extirpated if British competition is to be met in the West Indies or at north Atlantic ports.

The export committees of the National Coal Association and of the American Wholesale Coal Association have been invited by F. R. Wadleigh to confer in the near future with Secretary Hoover in an effort to devise further plans for meeting British competition. The date for this conference has not been set, but both the National Coal Association and the Wholesale Coal Association have expressed willingness to take part in such a conference.

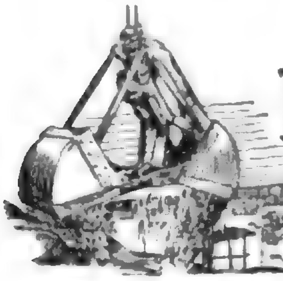
Hope practically has been abandoned of obtaining a voluntary reduction of tidewater rates. If such a reduction were confined entirely to coal going abroad, New England and other sections receiving coal in the coastwise trade would have an unquestioned claim to unjust discrimination. The committee of which W. V. Hardie, the director of traffic of the Interstate Commerce Commission, is chairman, has had no further meetings and at the time of this writing has none scheduled, which is taken as an indication that there is no immediate prospect of obtaining a rate reduction on tidewater coal prior to the general reduction likely to be put in effect about April 1 by an Interstate Commerce Commission order.

Lake Coal Shippers Plan Conference on Readjustment of Lake Rates

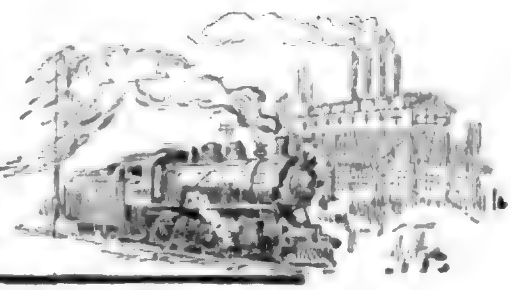
COAL operators interested in Lake shipping, dock operators and forwarders are planning to hold a conference early in the year for the purpose of arranging negotiations with Lake coal-carrying roads for the adjustment of the rates from mines to lower Lake docks for the next Lake coal shipping season, hoping to get the rate question out of the way so that shipping of Lake coal will not be delayed at the opening of navigation.

Last year shipments were held up for some time, as the 28c. reduction was not effective until early in May, and such coal as was shipped to the docks early had to stand the higher rates.

Shippers of Lake coal from Eastern mines contend that war-time advances in freight rates have created such a disparity in the rate relationships with mines in the Middle West that they cannot compete with all-rail coal to the Northwest unless reductions are made in the rates to the lower Lake ports.



Production and the Market



Weekly Review

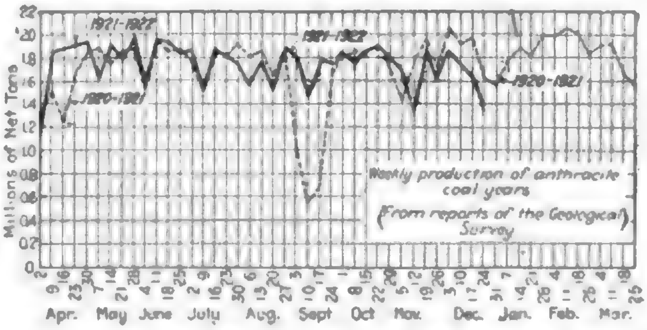
PRODUCTION of bituminous coal in the calendar year 1921 was about 408,000,000, according to the preliminary estimate of the Geological Survey. This is the lowest annual production since 1911 and is less than 1910. The output of soft coal in December was but 60 per cent of that in December a year ago and 12 per cent below the corresponding month in 1914.

Reaction from the holiday slump in bituminous coal production and prices is noticed in the reports for this week. Purchase of coal on the spot market was practically non-existent in the last three weeks of 1921. It has been resumed on a small scale with inquiry quite general for prices covering the first quarter. Buyers are, wisely enough, beginning to plan for the prospective miners' strike. So low, however, had production fallen and so readily can the market be supplied from the large mine capacity now available that so far prices have not been affected by the early 1922 inquiries.

WAGE CUTS CONTINUE IN NON-UNION FIELDS

COAL AGE index of spot prices of bituminous coal as the mines on Jan. 3 was 84, unchanged from the previous week. There were some changes, the increases being mainly along the Atlantic seaboard and the decreases in the West and Middle West. The price gains in the Eastern market were reactions from the low levels of previous weeks induced by an overloading of the market with distress coal.

Wage reductions in the non-union fields continue. More mines in the Somerest field are reported to have gone back to the 1917 scale. With the wage reductions made two weeks ago in southeastern Kentucky, operators in that field are giving evidence of an uneasy desire to get their coal back on the market. Wholesalers handling this coal in the Middle West fear the operators may flood the market with coal on consignment, to their own serious disadvantage. If this fear be realized there will be choice lots of high-grade coal on the bargain counter in Ohio, Michigan, Indiana and Western points before long. It is rather striking that the mine prices on western Kentucky coal are now above eastern Kentucky prices, the result of several modifications in freight rates favorable to the Western district.

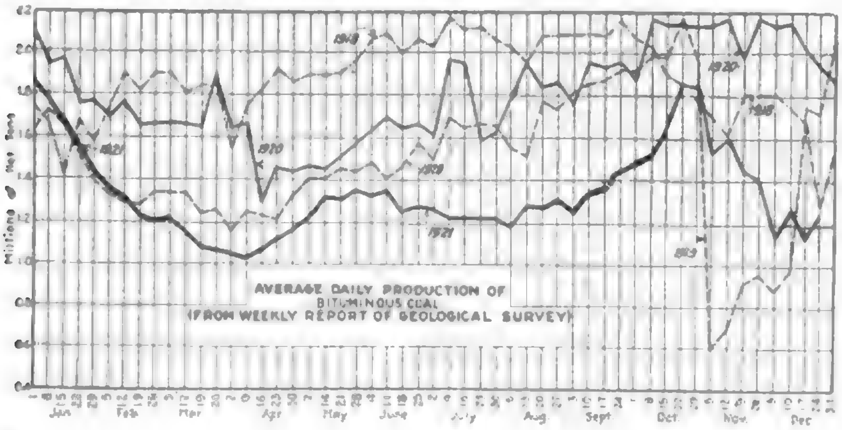


Anthracite production during the week before Christmas dropped to 1,338,000 net tons, the lowest since the first week in April and below the corresponding week of last year. "Coal-burning weather" has, however, arrived and although stocks in the hands of retailers are generally reported as large, the next two months are expected to record a resumption of anthracite demand and production at least equal to the early autumn rate.

BITUMINOUS

Production increased slightly during the week ended Dec. 24, according to the Geological Survey. The total output was 7,468,000 net tons, as compared with 7,066,000 tons for the preceding week. Preliminary reports for the last week of the year indicate that production was greatly affected by the holidays. The December output per day is estimated at 1,200,000 tons, barely 60 per cent of that in December, 1922, and even 12 per cent below that in December, 1914, the lowest of any winter in the last eight years.

In comparison with lack of demand all other operating factors have been of negligible importance. Losses ascribed to labor have averaged 1.1 per cent recently. The depression, however, was not as severe in some districts as in others. The best working time reported from the territory



Estimates of Production

(Net Tons)

Week Ended	1921	1920
BITUMINOUS COAL		
Dec. 10 (b)	7,312,000	12,865,000
Dec. 17 (b)	7,066,000	12,156,000
Dec. 24 (a)	7,468,000	9,686,000
Daily average	1,245,000	1,937,000
Calendar year	401,051,000	543,049,000
Daily average calendar year	1,330,000	1,795,000
ANTHRACITE		
Dec. 10.	1,703,000	1,933,000
Dec. 17 (b)	1,664,000	1,998,000
Dec. 24 (a)	1,338,000	1,641,000
COKE		
Dec. 17 (b)	127,000	334,000
Dec. 24.	118,000	272,000
Calendar year	5,405,000	20,547,000

(a) Subject to revision. (b) Revised from last report

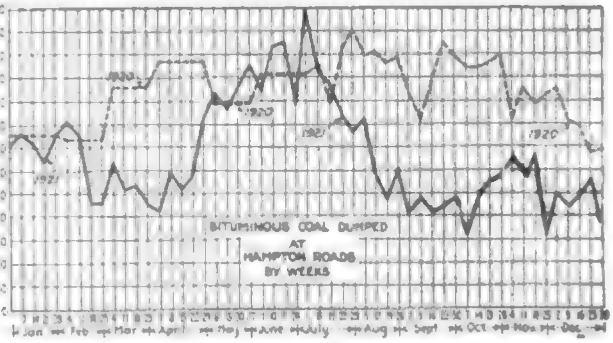
east of the Mississippi was in Alabama, where the mines operated 59.6 per cent of full time. Fields in which the average running time exceeded 40 per cent were Westmoreland, Somerset, Cumberland-Piedmont, the Panhandle of West Virginia, Virginia and Alabama, and certain of the trans-Mississippi districts. The depression was most pronounced in southern Ohio, New River and Kanawha, in none of which did the mines reporting average 20 per cent of full time. New River operators report a slight improvement over the condition of complete prostration indicated by their reports early in December.

The coal trade is crystal gazing into the future and a feeling is prevalent that better things are in store. Distress quotations are fewer and consumer interest in forward buying is growing. Prices have not as yet risen to this better tone and the non-union districts are making the most of their advantage in the way of mine costs.

Labor developments point to breakers ahead. The refusal of Ohio and Pittsburgh operators to treat with the United Mine Workers in the Central Competitive Field conference presages dealings with individual district miners' organizations, and a strike on the preservation of the check-off and collective bargaining appears to be inevitable. An increasing number of mines are returning to the 1917 scale, following the action of the men in the southeastern Kentucky and Tennessee fields. More mines have closed in the Midwest, operators preferring to remain closed until demand again sustains production.

Retail stocks of soft coal are still topheavy, although colder weather is working off some of this coal. Steam sizes are increasingly strong and will be until domestic coal is in better call, enabling producers to make more screened sizes.

The New England market is in better shape, not from any improvement in demand but due to mine curtailment, which has reduced the tonnage at the Roads. "Market" cargoes are less frequent and Pocahontas has regained its price of $4.60@$4.75.



Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Dec. 5 1921	Dec. 19 1921	Dec. 26 1921	Jan. 2 1922†
Pocahontas lump	Columbus	$3.75	$3.60	$3.55	$3.40@3.75
Pocahontas mine run	Columbus	2.25	2.15	2.15	2.00@2.25
Pocahontas screenings	Columbus	1.55	1.55	1.65	1.50@1.75
Pocahontas lump	Chicago	3.85	3.10	3.10	2.50@3.75
Pocahontas mine run	Chicago	2.25	2.25	2.40	**2.00@3.00**
Pocahontas lump	Cincinnati	3.10	3.25	3.25	3.00@3.50
Pocahontas mine run	Cincinnati	....	2.10	2.10	*1.85@2.25*
Pocahontas screenings	Cincinnati	....	1.40	1.65	*1.35@1.75*
*Smokeless mine run	Boston	4.80	4.80	4.55	**4.60@4.75**
Clearfield mine run	Boston	1.80	1.80	2.05	1.80@2.35
Cambria mine run	Boston	2.35	2.35	2.50	2.25@2.70
Somerset mine run	Boston	1.85	1.85	1.80	1.60@2.00
Pool 1 (Navy Standard)	New York	3.00	3.00	3.05	**2.90@3.40**
Pool 1 (Navy Standard)	Philadelphia	3.00	3.00	3.00	2.75@3.25
Pool 1 (Navy Standard)	Baltimore	2.40	2.35	2.35	**2.40**
Pool 9 (Super. Low Vol.)	New York	2.30	2.20	2.30	**2.20@2.45**
Pool 9 (Super. Low Vol.)	Philadelphia	2.35	2.30	2.30	2.10@2.50
Pool 9 (Super. Low Vol.)	Baltimore	2.05	2.15	2.20	2.15@2.25
Pool 10 (H. Gr. Low Vol.)	New York	2.05	2.00	2.00	**1.90@2.25**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.05	2.00	2.00	1.90@2.10
Pool 10 (H. Gr. Low Vol.)	Baltimore	1.85	2.00	2.00	2.00
Pool 11 (Low Vol.)	New York	1.70	1.70	1.75	*1.50@1.80*
Pool 11 (Low Vol.)	Philadelphia	1.85	1.70	1.70	1.60@1.80
Pool 11 (Low Vol.)	Baltimore	1.75	1.75	1.85	*1.75*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.55	1.55	1.50	1.40@1.60
Pool 54-64 (Gas and St.)	Philadelphia	1.70	1.55	1.55	1.45@1.70
Pool 54-64 (Gas and St.)	Baltimore	1.60	1.50	1.40	**1.40@1.50**
Pittsburgh sc'd gas	Pittsburgh	2.65	2.65	2.65	2.60@2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@2.20
Pittsburgh slack (Gas)	Pittsburgh	1.35	1.55	1.65	**1.75@1.85**
Kanawha lump	Columbus	3.00	2.85	2.85	*2.65@3.00*
Kanawha mine run	Columbus	1.90	1.80	1.90	*1.75@1.95*
Kanawha screenings	Columbus	1.00	1.05	1.15	**1.25@1.50**
Kanawha lump	Cincinnati	2.75	2.65	2.90	*2.75*
Kanawha mine run	Cincinnati	1.65	1.35	1.30	**1.35@1.50**
Kanawha screenings	Cincinnati	.95	1.25	1.15	**1.00@1.50**
Hocking lump	Columbus	3.10	2.95	3.05	*2.85@3.15*
Hocking mine run	Columbus	1.95	1.90	1.95	*1.85@2.00*

	Market Quoted	Dec. 5 1921	Dec. 19 1921	Dec. 26 1921	Jan. 2 1922†
Hocking screenings	Columbus	$1.15	$1.15	$1.20	**$1.25@1.50**
Pitts. No. 8 lump	Cleveland	3.05	3.00	3.00	**2.85@3.25**
Pitts. No. 8 mine run	Cleveland	2.00	2.00	1.95	**1.95@2.05**
Pitts. No. 8 screenings	Cleveland	1.50	1.60	1.70	**1.90@2.00**
Midwest					
Franklin, Ill. lump	Chicago	3.80	3.80	3.65	**3.50@4.05**
Franklin, Ill. mine run	Chicago	2.75	2.90	2.90	2.75@3.00
Franklin, Ill. screenings	Chicago	1.75	2.05	2.10	1.95@2.25
Central, Ill. lump	Chicago	3.35	3.10	3.10	2.75@3.50
Central, Ill. mine run	Chicago	2.25	2.50	2.50	2.25@2.75
Central, Ill. screenings	Chicago	1.70	1.80	2.00	*1.75@2.10*
Ind. 4th Vein lump	Chicago	3.35	3.35	3.35	3.00@3.75
Ind. 4th Vein mine run	Chicago	2.75	2.75	2.70	*2.40@2.75*
Ind. 4th Vein screenings	Chicago	1.90	2.15	1.75	**1.90@2.25**
Ind. 5th Vein lump	Chicago	2.80	2.80	2.95	2.60@3.25
Ind. 5th Vein mine run	Chicago	2.45	2.45	2.45	*2.15@2.40*
Ind. 5th Vein screenings	Chicago	1.50	1.65	1.80	1.60@2.00
Standard lump	St. Louis	2.85	2.60	2.80	*2.60@2.75*
Standard mine run	St. Louis	1.95	1.90	1.90	*1.85@1.90*
Standard screenings	St. Louis	1.15	1.25	1.40	**1.50@1.75**
West Ky. lump	Louisville	2.60	2.85	2.75	**2.90@3.10**
West Ky. mine run	Louisville	1.75	1.75	1.75	**1.75@2.00**
West Ky. screenings	Louisville	.95	1.40	1.85	*1.60@1.75*
South and Southwest					
Big Seam lump	Birmingham	3.65	3.65	3.65	*2.75@4.00*
Big Seam mine run	Birmingham	2.00	2.10	2.10	1.90@2.30
Big Seam (washed)	Birmingham	2.30	2.15	2.15	2.00@2.30
S. E. Ky. lump	Louisville	3.00	2.85	2.85	2.75@3.00
S. E. Ky. mine run	Louisville	2.05	1.70	1.50	**1.50@1.65**
S. E. Ky. screenings	Louisville	.95	1.15	1.45	*1.25@1.50*
S. E. Ky. lump	Cincinnati	3.15	3.15	3.15	*2.75@3.25*
S. E. Ky. mine run	Cincinnati	1.75	1.40	1.30	**1.35@1.60**
S. E. Ky. screenings	Cincinnati	.85	1.15	1.25	*1.00@1.40*
Kansas lump	Kansas City	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City	4.10	4.10	4.10	4.00@4.25
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.

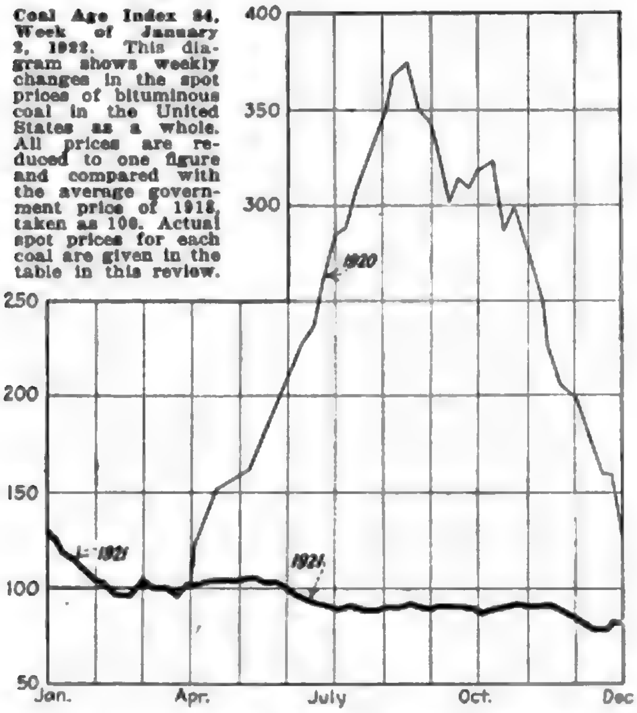
†Advances over previous week shown in heavy type, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Dec. 19, 1921		Dec. 26, 1921		Jan. 2, 1922†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.50@$7.75	7.75@7.85	$7.50@$7.75	7.75@7.85	*$6.75@$7.50*	7.75@7.85
Egg	New York	2.61	6.50@7.25	7.60@7.75	7.00@7.25	7.60@7.75	*6.50@7.00*	7.60@7.75
Egg	Philadelphia	2.66	7.25@7.75	7.75@7.85	7.00@7.25	7.75@7.85	7.00@7.25	7.75@7.85
Egg	Chicago	5.63	7.50*	7.15*	7.40*	6.95*	7.40*	6.95*
Stove	New York	2.61	8.00@8.25	7.90@8.10	8.00@8.25	7.90@8.10	*7.85@8.25*	7.90@8.10
Stove	Philadelphia	2.66	8.50@8.75	8.00@8.35	8.25@8.50	8.05@8.25	8.25@8.50	8.05@8.25
Stove	Chicago	5.63	7.75*	7.40*	7.60*	7.20*	7.60*	7.20*
Chestnut	New York	2.61	8.00@8.25	7.90@8.10	8.00@8.25	7.90@8.10	*7.85@8.25*	7.90@8.10
Chestnut	Philadelphia	2.66	8.50@8.75	8.05@8.25	8.25@8.75	8.05@8.25	*8.25@8.60*	8.05@8.25
Chestnut	Chicago	5.63	7.50*	7.40*	7.60*	7.20*	7.60*	7.20*
Pea	New York	2.47	4.75@5.50	6.05@6.45	4.50@5.00	6.05@6.45	*4.00@5.00*	6.05@6.45
Pea	Philadelphia	2.38	4.25@5.00	6.15@6.25	4.50@5.00	6.15@6.25	*4.25@5.00*	6.15@6.25
Pea	Chicago	5.63	6.10*	5.80*	6.10*	5.60*	6.10*	5.60*
Buckwheat No. 1	New York	2.47	2.25@2.75	3.50	2.25@2.75	3.50	*2.00@2.75*	3.50
Buckwheat No. 1	Philadelphia	2.38	2.25@3.00	3.50	2.25@3.00	3.50	*2.25@2.75*	3.50
Rice	New York	2.47	1.60@2.00	2.50	1.60@2.00	2.50	**1.80@2.25**	2.50
Rice	Philadelphia	2.38	1.75@2.00	2.50	1.75@2.00	2.50	1.75@2.00	2.50
Barley	New York	2.47	1.00@1.25	1.50	1.00@1.50	1.50	**1.25@1.50**	1.50
Barley	Philadelphia	2.38	1.00@1.25	1.50	1.00@1.25	1.50	1.00@1.25	1.50
Birdseye	New York	2.47	....	2.50	....	2.50	....	2.50

*Net tons, f.o.b. mines.

†Advances over previous week shown in heavy type, declines in *italics*.



Coal Age Index 84, Week of January 2, 1922. This diagram shows weekly changes in the spot prices of bituminous coal in the United States as a whole. All prices are reduced to one figure and compared with the average government price of 1918, taken as 100. Actual spot prices for each coal are given in the table in this review.

The all-rail movement to New England was 2,627 cars during the week ended Dec. 17, a slight increase when compared with the previous week. The bulk of this tonnage is now moving to New England railroads and on commercial contracts made last spring. It is difficult to see any future business in a large slice of the all-rail territory with the existing freights and union costs which are so easily undercut by the water-borne coals.

Hampton Roads dumpings were 175,517 net tons in the week ended Dec. 28, as compared with 286,862 in the preceding week. Exports are practically nil, as shippers are powerless to meet the British c.i.f. prices. Bunkers are holding well.

ANTHRACITE

Production slipped down to 1,338,000 net tons during the week ended Dec. 24, a decline of 326,000 tons, or 19.6 per cent. The arrival of colder weather with the curtailed production was about all that saved independent domestic prices from going lower. Steam sizes are improved also although none of these is selling at a premium.

The retailers must work off heavy stocks before mine operations improve, but this time will, of course, be hurried by a continuance of the present seasonable weather. Many independent customers are registering uneasiness over the maintenance of the premiums and are showing an interest in the company product. The latter are now evincing a disposition to take on some of this new business.

COKE

Curtailed working time during the week ended Dec. 24 resulted in production dropping back from 127,000 to 118,000 net tons. The Connellsville output registered a decline of 8,600 tons.

More first-quarter contracts have been closed. The disposition of this business will be more significant than usual this year, as inquiring customers will decide between beehive and byproduct offerings. The spot market remains inactive, with prices soft.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

GERMANY—Production of coal in the Ruhr region during the week ended Dec. 19 was 1,845,000 metric tons, according to a cable to COAL AGE. This is an increase of 214,000 tons, as compared with the week preceding.

ITALY — October imports of coal, according to unofficial figures reaching the Department of Commerce, were as follows: England, 416,152 tons; Westphalia, 118,700 tons; United States, 4,000 tons.

The price of Cardiff steam first is quoted on the Genoa market at 38s., according to a cable to COAL AGE, as compared with 38s. 9d. late in December.

SWEDEN—Imports of coal and coke during the week ended Dec. 13 were 14,225 tons, compared with 10,875 during the previous week. The imports came exclusively from Great Britain and consisted of 11,900 tons of coal and 2,325 tons of coke.

SPAIN—Owing to the belief that the railway companies and other public services will be obliged by government orders to use Spanish coal the price of the latter has strengthened. Latest quotations are: Large, 90 pesetas; small, 70 pesetas. The peseta equals about 13c. in United States currency at the present time.

POLAND.—All restrictions relating to the trade in coal and briquets are removed for all of Poland, according to *Commerce Reports*. All treasury and governmental charges relating to the mining, sale, and consumption of coal, coke and briquets will be paid by respective treasury branches as designated in laws and orders on taxation.

Less Coal at the Roads; Lower Transportation Costs Are Necessary

Business moved more steadily during the last week of the year, although export cargoes were scarce. The fact that many mines practically closed down for the holidays gave the supplies at port the appearance of moving with a greater rapidity than usual, although business, for the most part, showed no change from the dullness which has characterized it during the month.

While the business of the immediate present has not been such as to give basis for a more than indifferent forecast, still dealers believe that better times are ahead. The belief is also expressed that with a reduction of as much as $1 in freight rates, and a slight reduction in ocean rates, American coal shippers can compete with the British, which are rapidly gaining ground. Several small cargoes of British coal have recently come into this port, serving as ballast for vessels coming to pick up return cargoes from America.

Prices showed a slight reduction during the latter part of December. Pool 1 has been sold in considerable quantities for as low as $4.65, while some Pool 2 has been offered for $4.45@$4.50. Practically no sales have been made in grades lower than these.

Amount and Value of British Coal Exports, November and First Eleven Months of 1913, 1920 and 1921

	November					
	Quantity (Tons)			Value		
	1913	1920	1921	1913	1920	1921
Anthracite	255,959	70,099	233,156	£200,746	£264,550	£538,074
Steam	4,322,462	1,097,869	2,757,616	3,039,010	4,673,913	3,540,244
Gas	936,829	160,339	454,086	603,480	619,535	623,501
Household	140,129	10,017	38,009	94,444	34,937	51,704
Other sorts	258,025	22,400	110,997	162,904	88,549	124,496
Total	5,913,404	1,360,724	3,593,864	£4,100,584	£5,681,484	£4,878,019

	Eleven Months Ended November					
	Quantity (Tons)			Value		
	1913	1920	1921	1913	1920	1921
Anthracite	2,726,893	1,472,271	1,241,789	£2,177,780	£4,707,111	£3,193,222
Steam	49,030,578	18,371,452	15,183,794	34,613,303	74,930,524	27,077,433
Gas	10,547,038	1,911,580	3,065,151	6,516,605	7,581,024	5,933,149
Household	1,635,335	65,935	172,631	1,074,563	187,352	300,011
Other sorts	3,230,821	808,539	688,025	2,015,734	2,876,446	1,081,815
Total	67,170,665	22,629,777	20,351,390	£46,397,985	£90,282,457	£37,585,630

British Output Touches Highest Point of Year

With Falling Prices Pits Near Full Time Operation—French Mines Crippled by High Costs Which Render Them Unable to Compete at Home with British Coal

Production in the United Kingdom continues to increase. The output for the week ended Dec. 17 was 5,027,000 gross tons, according to a cable to *Coal Age*, 172,000 tons in excess of the preceding week's figure and the highest for the year.

Pits in Wales and northern England are gradually getting back to full-time operation as a consequence of the lower prices. The majority of the large collieries in Durham and Northumberland are on full-time and Scotland is improving, owing to the increased export demand.

Another inquiry from India is for 300,000 tons of Welsh Admiralty and Monmouthshire coal for shipment to Indian ports. This inquiry comes from private sources. The Bombay and Baroda Ry. which, two months ago, contracted for 175,000 tons before May, has increased this figure by 60,000 tons. The Norwegian State Rys. has placed a contract in Northumberland for 35,000 tons of steam coal for shipment during January and February. Contracts have also been placed in Durham by the Copenhagen municipal gas and electric works for 10,000 tons of steam coal to be shipped during the first three months of 1922.

The returning export markets have brought to the fore the necessity for even greater production. A conference for discussing a resumption of the third shift, which adjourned over the holidays, will be called again next week. The percentage of miners returning to work immediately after the holidays is much larger than usual.

The managers of all the principal railway companies in Great Britain held a further meeting recently to consider the possibilities of a reduction of freight rates. The question was examined in full detail, particularly in relation to the requests from the coal owners for modified charges. Mine owners contended that the cheapening of coal for industrial and domestic purposes could only be obtained by a substantial cut in transportation rates. No decision has yet been reached.

The successful invasion of the West Indies by the British has followed their underbidding American houses by as much as $1 per ton. There is no doubt but that British coal is being sold there at a loss in order to create a demand which will enable producers to operate on a maximum scale and thus reduce their costs.

Further shipments of Welsh coal to the American seaboard are disturbing those markets. Ordinarily this ballast coal would make little difference in the trade but on a dull market it is noticeable at once.

French Industry In Bad Shape; Price Cuts Imperative

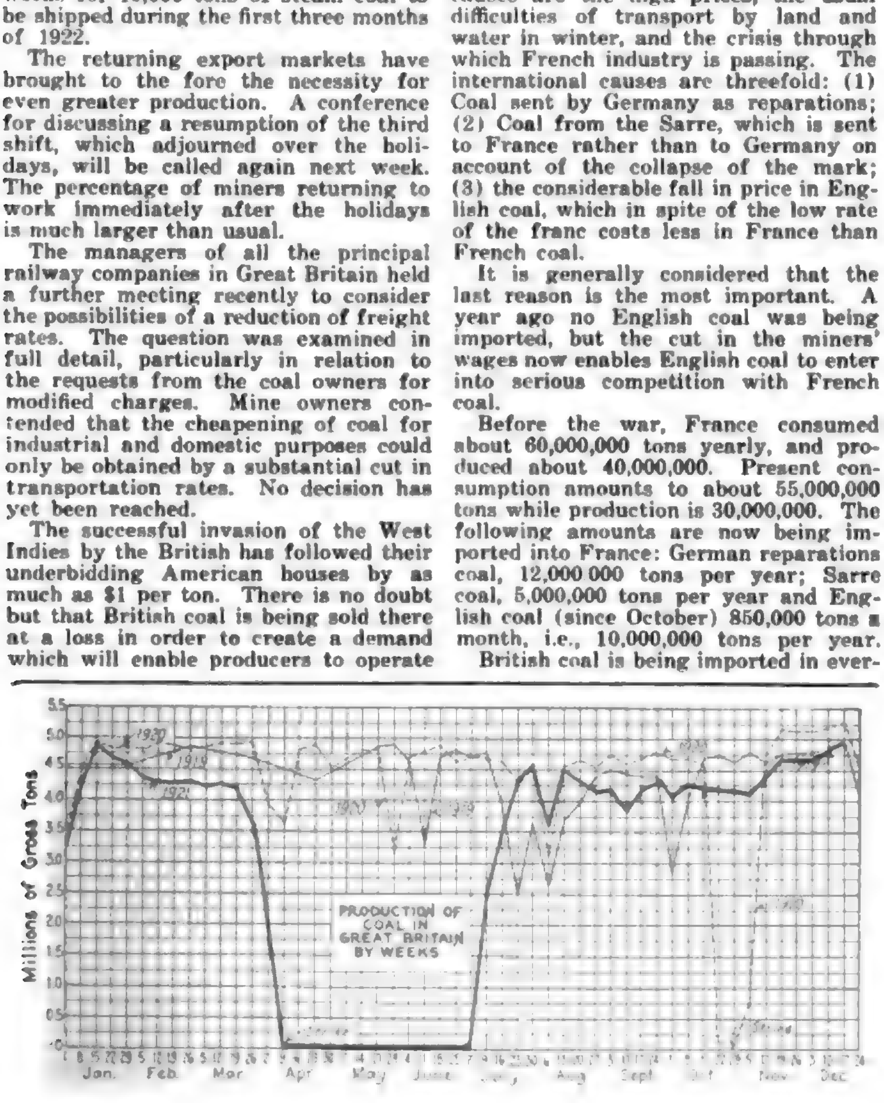
The one-day strike of the French miners organized as a protest against the high price of French coal, and the consequent unemployment among miners, has drawn attention to the difficult situation of the French coal industry. At the end of October this year there were 1,560,000 tons of coal waiting at the pit heads, 800,000 tons being in the Nord and the Pas de Calais. Nearly two-thirds of the month's production remained in stock. The mines in the Center and East lowered their prices as from October, with the result that a part of the stock has been liquidated; the situation in the North, however, grows worse and worse. The local causes are the high prices, the usual difficulties of transport by land and water in winter, and the crisis through which French industry is passing. The international causes are threefold: (1) Coal sent by Germany as reparations; (2) Coal from the Sarre, which is sent to France rather than to Germany on account of the collapse of the mark; (3) the considerable fall in price in English coal, which in spite of the low rate of the franc costs less in France than French coal.

It is generally considered that the last reason is the most important. A year ago no English coal was being imported, but the cut in the miners' wages now enables English coal to enter into serious competition with French coal.

Before the war, France consumed about 60,000,000 tons yearly, and produced about 40,000,000. Present consumption amounts to about 55,000,000 tons while production is 30,000,000. The following amounts are now being imported into France: German reparations coal, 12,000 000 tons per year; Sarre coal, 5,000,000 tons per year and English coal (since October) 850,000 tons a month, i.e., 10,000,000 tons per year.

British coal is being imported in ever-increasing quantities. It is pointed out that in order to render British competition less serious, the remedy is not to charge increased customs duties, as such a remedy would have the effect of maintaining the high price of French coal.

The only remedy would appear to be to reduce the price of French coal. For this, a reduction of profits would not be sufficient; either a reduction of wages, or an increase of production for the same wages, would also have to be considered.



Pier and Bunker Prices, Gross Tons

(Foreign Bunker Quotations by Cable to Coal Age)

PIERS

	Dec. 24	Dec. 31†
Pool 9 New York	$5.25@$5.50	**$5.40@$5.60**
Pool 10, New York	5.00@ 5.25	**5.10@ 5.30**
Pool 9, Philadelphia	5.50	5.50
Pool 10, Philadelphia	5.00@ 5.40	5.00@ 5.40
Pool 71, Philadelphia	5.50@ 5.75	5.50@ 5.75
Pool 1, Hamp. Rds.	4.50@ 4.75	*4.50@ 4.70*
Pools 5-6-7 Hamp Rds	4.30	*4.25*
Pool 2, Hamp. Rds.	4.50	4.50

BUNKERS

	Dec. 24	Dec. 31†
Pool 9, New York	5.55@ 5.80	**5.70@ 5.90**
Pool 10, New York	5.30@ 5.55	**5.40@ 5.60**
Pool 9, Philadelphia	5.50@ 5.85	5.50@ 5.85
Pool 10, Philadelphia	5.35@ 5.50	5.35@ 5.50
Pool 1, Hamp. Rds.	4.75	**4.80**
Pool 2, Hamp. Rds.	4.50	**4.60**
Welsh, Gibraltar	40s. f.o.b.	40s. f.o.b.
Welsh, Rio de Janeiro	65s. f.o.b.	65s. f.o.b.
Welsh, Lisbon	45s. f.o.b.	45s. f.o.b.
Welsh, La Plata	62s.6d. f.o.b.	62s.6d. f.o.b.
Welsh, Marseilles	125fr. f.o.b.	125fr. f.o.b.
Welsh, Genoa	40s. t.i.b.	40s. t.i.b.
Welsh, Madeira	42s.6d. f.a.s.	42s.6d. f.a.s.
Welsh, Teneriffe	42s.6d. f.a.s.	42s.6d. f.a.s.
Welsh, Malta	45s. f.o.b.	45s. f.o.b.
Welsh, St. Michaels	60s. t.i.b.	60s. t.i.b.
Welsh, Las Palmas	42s.6d. f.a.s.	42s.6d. f.a.s.
Port Said	51s.6d. f.o.b.	51s.6d. f.o.b.
Belgian, Antwerp	40s. f.o.b.	40s. f.o.b.
Alexandria	45s.	*42s.*
Bombay	38 rupees	38 rupees
Capetown	42s.6d.	42s.6d.

C.I.F. Prices, American Coal

(In Gross Tons)

	Dec. 24		Dec. 31†	
	Low Vol.	High Vol.	Low Vol.	High Vol.
French Atlantic	$8.65	$8.85	*$8.60*	*$8.80*
West Italy	8.70	8.85	8.70	8.85
The Plate	8.80	8.95	.....	.....
Havana	6.70	6.95	*6.50*	*6.75*

These quotations are purely nominal and as far as can be learned, no business is being done in these markets.

Current Quotations British Coal f.o.b. Port, Gross Tons

Cardiff:	Dec. 24	Dec. 31†
Admiralty, Large	26s.	*25s.6d.@26s.6d.*
Steam, Smalls	19s.6d.	*18s.6d.@19s.6d.*
Newcastle:		
Best Steams	25s.	*23s.6d.@24s.*
Best Gas	22s.	*21s.6d.@22s.*
Best Bunkers	21s.9d.	*21s.@22s.*

† Advance over previous week shown in heavy type, declines in italics.

Export Clearances, Week Ended Dec. 29, 1921

FROM HAMPTON ROADS:

	Tons
For Cuba:	
Br. Schr. Harry A. McLennon, for Cienfuegos	1,046
Nor. S.S. Trafalgar, for Media Luna	829
Nor. S.S. Snar, for Havana	1,946
FROM PHILADELPHIA:	
For Egypt:	
Br. S.S. Mortlake, for Alexandria	——

Hampton Roads Pier Situation

	Week Ended Dec. 22	Week Ended Dec. 29
N. & W. Piers, Lamberts Point:		
Cars on hand	1,415	1,757
Tons on hand	74,937	97,718
Tons dumped	118,798	72,684
Tonnage waiting	7,250	2,300
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	907	922
Tons on hand	52,250	62,500
Tons dumped	69,998	50,033
Tonnage waiting	......	19,435
C. & O. Piers, Newport News:		
Cars on hand	527	**864**
Tons on hand	41,350	**48,200**
Tons dumped	67,331	**33,995**
Tonnage waiting	915	**1,687**

Reports From the Market Centers

New England

BOSTON

Market Extremely Quiet—Prices Stable—Less Forcing by Smokeless Agencies—Trade Looking Forward to Wage Adjustments—Anthracite Dormant.

Bituminous—There is so little business that salesmen are taking a recess. Fewer quotations are heard and buyers are not interested. Reserves are large. Cargoes continue to be divided at the various rehandling points, but for the most part those shipments are conservatively managed and the coal is not needlessly sacrificed.

The range of prices has varied very little the past few weeks. The up-set figure for the best Pocahontas and New River is $6.25 on cars, Boston, and $4.60 @$4.75 is about the level f.o.b. vessel at Norfolk and Newport News. On the Pennsylvania grades also there is little change. Other prices, f.o.b. mines, are shown in the Weekly Review.

Receipts all-rail are very light, and aside from railroad fuel and coal coming forward commercially on last spring's contracts there is next to nothing moving.

It is gratifying to notice less "market" coal coming from Hampton Roads. Accumulations at the loading piers have been worked down, and on the part of operators there is less inclination to mine coal except on a more assured market. Slow collections have a bearing on this, for it is generally understood that some of the agencies have been taking rather wide chances on credits. However, the larger buyers who have been served with Pocahontas and New River coals this season are accepting it as a fact that during the coming year the prices of these grades will bar coals from central Pennsylvania.

The rate differentials are such and mining costs in the union districts are so high that receipts here of Pennsylvania coals by water are very small indeed. A few cargoes seep in through out of the way ports where shoal water would very much increase the freighting cost on the smokeless coals, but aside from that kind of trade and a certain tonnage moving on contract to railroads east of Boston and Portland there is almost nothing doing.

Anthracite—While certain of the companies have enough business in hand for stove and chestnut sizes to keep them going for a few weeks, it is clear that egg and pea are being absorbed only with great difficulty and much easing of price. The larger shippers are of course putting the latter sizes into storage, but individuals are slashing circular prices in their efforts to avoid piling up.

New England is taking only a minimum tonnage now. The retail dealers are well stocked, and until the householder takes more coal than he has hitherto the dealer will buy only sparingly.

The retail trade is disturbed over lowered prices on pea. From $13 per net ton delivered, the published price has been reduced to $10.50 to work off surplus stocks accumulated while stove and chestnut were scarce.

Tidewater—East

NEW YORK

Domestic Demand Slumps Further—Premiums Disappear—Curtailed Mining Cleans Up Surplus Coals—Bituminous Market Quiet—Quotations Stable.

Anthracite—Demand is quiet and comparatively little coal is being mined. Curtailment of mining prevents independent prices from falling further. The cold wave the last two days of the week caused a slight flurry, retail dealers reporting the receipt of many orders.

The Christmas spirit prevailed throughout the week. Because of weather conditions early in the week consumption was small and it was useless for salesmen to circulate among the trade with the view of selling coal. Nowadays, as one salesman put it, the soliciting of an order usually results in an argument.

Nothing short of a continued spell of real winter temperatures will bring much activity. Retail dealers are doing little. The trade does not look for a rush of orders. Dealers are not anxious to have their bins filled with high priced coal on April 1, when the operators as a rule reduce their prices 50c.

One dealer said the market had not been so quiet at this time of the year in the past thirty years. Most of the mines were idle during the week and it was said that many of them would not resume operations until demand improved.

The month was unusually quiet in sharp contrast with December, 1920.

Stove and chestnut sizes which were in heavy call during the past several months are now in ample supply but are not accumulating like egg and pea coals.

Premiums on independent coals have disappeared and it was reported that some of the larger companies were shaving the circular prices on certain of their coals. Egg coal continues to be broken up.

There is an abundance of buckwheat between Tidewater and the mines and many loaded boats are in the harbor. These are being quoted $4.75@$5.25 alongside. Barley is firm with the better grades bringing company circular. Other prices are shown in the Weekly Review.

Bituminous—There is less free coal at the local piers than at any time since the threatened railroad strike. Demand is light and prices are at about the same level as last week. With the holiday season over and the resumption of operations in many factories there are prospects of a slight revival in coal buying.

Even the comparatively small quantity of coal at the local docks is sufficient to meet all demands. Contract coals are kept moving.

There have been many price inquiries during the week. Some new year orders are reported to have been placed at $2.25@$2.50 for Pool 10 and around $2.75 for Pool 9.

A fair tonnage of Southern coals continues to come here and is apparently being disposed of without much trouble. Quotations for Pocahontas or New River range $5.85@$6, f.o.b. vessel, this harbor.

BUFFALO

Trade Remains Stagnant—All Coal Selling Much Slower Than Usual at This Season—No Early Improvement Seen.

Bituminous—The trade is as quiet as ever. Consumers are not buying more than they need for present consumption, often because they have no more storage capacity. The consumers know that they are not likely to get their coal much, if any, cheaper than at present, so they are usually willing to buy as far as they are able to take care of the coal.

The coming of more severe weather has not increased the demand. The stories of canceled orders and coal thrown on the market at almost any price continue. They are always heard when the market is extremely dull.

It is said every class of bituminous consumers is now heavily stocked. If a railroad does not keep up its big piles at certain points as formerly it will be found that it has the coal somewhere. For such reasons the shippers have given up predicting a stir just before the April suspension for the fixing of wages.

In general it is held that a suspension of considerable length will be a good thing. If wages are cut down to a living basis the operator and all members of the trade are going to lose less on account of a strike, than to continue present wages, if they do not make anything by it. Prices will not be affected unless the suspension is lengthy. Meanwhile quotations remain at $2.75 for Youghiogheny gas lump, $2.50 for Pittsburgh and No. 8 steam lump, $2.25 for Allegheny Valley or other mine run, and $1.50@$1.75 for slack.

Anthracite—The colder weather does not help the demand much. This means that it is about as dull as it ever is at this time of the year. Nobody can give a really adequate reason for the refusal of consumers to buy. Some say that they have not yet given up the idea that prices are to come down soon. Others think that money is scarce and so many more consumers are buying by the load or single ton that it has seriously affected the movement.

The present condition of things has not been seen before in many a year. Miners are on strike and mines are running on half time and yet the coal supply does not run down. All storage capacity in this vicinity is taken up, the Lake trade was affected by over-shipments and pretty nearly every condition that is abnormal has entered the trade.

Chestnut is now more scarce than stove and the furnace sizes are in great over-supply. Remark is made that loads of coal passing through the city are about as uncommon as they were in midsummer. Some members of the trade express the opinion that the anthracite scale of wages will be harder to settle than the bituminous and they look for a long suspension of mining.

Coke—Furnaces are running at about half capacity, with no promise of increase right away. Byproduct coke plants about keep pace with this activity. Jobbers quote 72-hr. Connellsville foundry at $4.15, 48-hr. furnace at $3.15 and stock at $2.75.

BALTIMORE

New Year Gives Better Promise for Coal Trade—Bunker Prices Tighter—Export Movement Increasing—Hard Coal Demand Better.

Bituminous—The coming of the New Year was very welcome to the coal trade in view of some rather bad experiences in 1921. There is no longer a doubt that general business is on the upward trend and the coal trade with it.

Port figures on general merchandise show an increasing line of export. The business of the port last year was 40 per cent greater than in average prewar years. The close of December brought a renewal of export movement. Five vessels were loaded between Dec. 17 and 29.

Bunker prices reflect a better port movement. The best coals at Tide which sold two weeks ago on a grosston basis at piers as low as $4.50 are now worth $5.10@$5.20. Line business is not strong, although there is some sign of strengthening. Best steam coals are held $2.25@$2.40 a net ton f.o.b. mines. Some good steam coals are still on the market here at $2@$2.10. Best gas lump is holding at $2.25@$2.40, with mine run from Pennsylvania sources at about $2. West Virginia gas lump is still obtainable around $1.85 and mine run at $1.50 in many cases.

Anthracite—Hard coal dealers report that snappier weather has brought better demand. This is being evidenced in from one to three ton orders for the most part. There is plenty of coal running and a fair stock in yard.

PHILADELPHIA

Anthacite Buying Light — Shippers Curtail Working Time—Retailers Hold Back Orders—Steam Sizes Quiet—Bituminous Inquiries Increase — Better Buying Looked For.

Anthracite—Retail buying has been moderate, although the weather has been cold enough to call for heavy consumption of fuel. The dealers have put out some coal, in fact more than they have taken in, as they seem to have grown ultra-conservative in this respect.

Operators are experiencing more difficulties than for years. The lack of ordering has caused them to lose time at the collieries. Most of them took quite a few extra days in addition to the regular holidays, and unless there is some continued cold weather further vacations are in order.

Independents have not cut prices recently, as with the shorter working time they have been able to dispose of their surplus. Nevertheless there is some uneasiness over the price situation.

Some of the local retailers have received forms from Secretary Hoover asking information as to stock on hand. Of course replies are purely voluntary, and the report is that the authorities are gathering information as to coal above ground in view of possible trouble at the mines in the spring.

Steam coals remain quiet, as the reduced working time has cut down output. Buckwheat can be had on the spot market at $3, rice $2, with barley $1.25@$1.50.

Bituminous—The end of the year has probably been productive of the lightest tonnage of the entire season. Large consumers have bought lightly in order that their inventories for the year would be low. Production has been light but even now there seems to be some slight trend toward betterment.

Shippers have received quite a lot of inquiries for prices. This indicates that the consumer wants to be ready to take in some coal soon.

Prices at times are inclined to sag a trifle, with some good coals offered below the market average when taken in small blocks, but on the whole the average as reported in current quotations this week is a fair index of the spot market.

Railroads show no inclination to increase their purchases, evidently being content to take coal as needed, without adding to the light stocks already on hand. The Tide situation does not improve, and remains almost in a state of lethargy.

Among the more prominent shippers there is a pronounced tendency to do away entirely with the practice of quoting prices on the pool number system. Producers of the highest grade fuels are now selling them by name. In time it is felt that the custom will grow and that to quote a pool number will likely raise the suspicion of a possible inferiority.

Northwest

DULUTH

Prices Break so as to Unload Docks of Bituminous—Anthracite Firm—No Industrial Improvement Is Noticeable.

A break in prices has again occurred at the Head-of-the-Lakes, with bituminous down $1 all around. This is due to the lack of buying which failed to hold up to expectations. Cold weather has not brought expected results and dock men are lowering the bars so that they will not be caught with excess stocks.

Anthracite has not followed bituminous on the toboggan and is holding firm at former levels, with the exception of buckwheat which is showing signs of weakening. No break in anthracite is anticipated.

Prices are $6 a ton for Hocking, Fairmont and Youghiogheny lump, $5.25 for run of pile. Screenings are firm at $4. Hazard has dropped to $6 from a list of $7. Pocahontas, lump and egg, is at $9 from a former price of $10. Smithing is being sold in bulk at $8.

A comparison of prices with the peak in October, 1920, is interesting. At that time Youghiogheny, Hocking, and Fairmont lump were selling at $14, with a price of $12.50 on run of pile. In April of 1921 the price came to $11.75 and $7.50, and in May lump dropped to $7 and held.

No industrial improvement has been felt in the Northwest during the month and it seems probable that the large consumers at the head of the Lakes will not get their plants started until well after the middle or last of January. Shipments have been increasing, however, on the basis of the reduction in prices.

Railroads are taking more coal now and are filling their coal depots against a possible shortage when transportation gets tied up. The cold weather also makes it imperative that the railroads use more coal in fueling.

Dealers in anthracite are buying in one carload lots only and are evidently holding down their orders in the hope that lower freight rates on coal will go into effect following the first of the year.

MILWAUKEE

Old Year Closes with Cold Snap—Lively Demand for Coal—Prices Held Firm—Cutting Reported in Screenings.

The last week of the old year brought a spurt to the coal market, due to a spell of near zero weather. Local deliveries and rail shipments were correspondingly stimulated. The demand from householders runs largely to the domestic grades of soft coal, with anthracite a close second. Coke is in little demand.

The price schedule on both anthracite and soft coal is maintained as a rule, but dealers report that screenings are being marketed in some cases at a cut in price. To what extent this practice is carried on is hard to discover. The dock companies here hold the whip hand when it comes to controlling prices, and the "thousand and one" small dealers who have no yards but who do business on a commission basis must stick to the schedule or go without coal; hence price shading calls for the strictest caution.

The market from now on through the winter in both city and country will be influenced largely by weather conditions. A strong and prolonged cold wave is bound to cause much discomfort in the city as the stocks carried by consumers this winter are so small that deliveries will be unable to keep pace with the rush of orders that a cold wave will bring.

MINNEAPOLIS

Cold Snap May Stimulate Market Soon—Drops in Prices Expected to Rouse Business—Consumers Fear no Shortage.

A little of the old-fashioned winter prevailed here lately, with two days of cold weather. If this continues it will undoubtedly have some real effect upon the coal market. But until it registers with increased orders from the retail trade generally, it will merely augment consumption.

Business has been so slack in Eastern soft coal, that reductions in the retail price of Youghiogheny and Hocking of $1 a ton have been announced. Youghiogheny and Hocking are selling $10.75@$11 and Pocahontas $13.95@$14.35.

People in the trade have been watching for severe weather, believing that it would certainly bring about a rush of business. They based the expectation upon the fact that no one was carrying any heavy stock, and the first suggestion of severe weather would mean a quick running down of the supply and an early need for more. But buying is too much inclined to hold back, to reverse itself until lack of coal compels it. Probably many retailers would have preferred to let their last of December orders wait until into

January, as would consumers wish to get their purchases on February statements rather than January. But there has not been a generally increased buying so far.

People are not at all alarmed as to any risk being run in waiting until the last minute before getting a new supply. There is an ample store of coal on the docks for all probable needs, and there is no difficulty with the railroads moving freight without delay. The cold days resulted in delays to train movement, but there were no trains tied up in snow drifts, as happened twenty and thirty years ago.

The trade sees in the cold waves that prevailed lately, a chance for moving a better tonnage than has been possible heretofore, and hopes for a chance to recoup against some of the offsets of the past two or three months. The general tendency is against much activity, but even that tendency cannot withstand the effects of continued severe weather.

Domestic trade is being cut down by the use of wood and other substitutes, including crude oil burning devices. The latter are marketed freely. How successful they are, remains to be seen. They give a very alluring initial demonstration. People are certainly installing them for cooking and also for operating heating plants. Just as far as they are put in, they cut down the outlet for coal.

Inland West

CHICAGO

Market Duller Than Usual—City Full of Coal Salesmen Drawn Off the Road—Steam Demand May Pick Up Soon.

Christmas week made the market even duller than ordinary. A great many sales agents, representing both wholesalers and operating companies, have left town over the holidays, while some have packed their belongings and gone South for a longer stay.

Practically all of the big companies having headquarters in Chicago have called their salesmen in from the road, and have turned them loose to call on the city trade. So the average coal buyer, whether he burns steam coal or is a retailer, is having a good run for his money.

Even though the retail trade has been stimulated slightly during the past week this stimulation has not as yet been felt by the producer or wholesaler because the retailers and steam buyers have had such large quantities of coal on hand that they have not been forced in the market to buy. It will take another two or three weeks of very coal weather before much can be looked for, either from the steam user or the retailer.

The steam market continues to improve. It is safe to say that screenings from the best fields in either Illinois or Indiana will soon bring in excess of $2 per ton. In fact, the average price today on current sales is about that. The Chicago steam coal market is in a state of excitement because it has been rumored that some of the railroads are going to start buying in anticipation of strikes.

The market on Eastern coals is very inactive. Anthracite is only moving forward in small quantities. The old line companies are holding their prices fairly firm, but the independents have made some substantial cuts. No sales stimulation, however, has resulted. There is practically no market at all in Chicago for West Virginia splint or Kentucky block, while the sales made during the last few days on Pocahontas and smokeless coals have all been forced, as the dealer is only buying when sorely tempted by an attractive price.

DETROIT

Buying of Steam and Domestic Bituminous Continues Light—Shipments Are Small and Chiefly from Unorganized Mine Districts.

Bituminous—Very little coal is being sold in Detroit, either steam or domestic. Business in the closing week of 1921 is as torpid as it was earlier in the year. Wholesalers and jobbers are finding it extremely difficult to interest customers.

The situation runs parallel with that in general business. Manufacturing and industrial plants are, in most instances, running on very low schedules with a much smaller consumption of coal than normal.

The movement into Detroit is light. The greater proportion of the shipments are said to be coming from the unorganized mining districts of West Virginia. Producers in the unionized mine areas are closing down or curtailing, because of their inability to meet the competition of the unorganized mines.

Despite the cold of the week, the demand from domestic consumers has not awakened.

Four inch lump from West Virginia is quoted at $3, two-inch lump $2.50, egg $2.25, mine run $1.75, slack $1.25. Three-inch lump from Ohio is offered at $3, egg $2.25, mine run $2, slack $1.50. Pittsburgh No. 8, 1¼-in. size, is $2.35, three-quarter lump at $2.25, mine run $2, slack $1.75. Smokeless lump and egg is holding around $3.50, mine run $2.25, slack $1.25.

Anthracite—Most of the retail yards are well supplied but the volume of buying is disappointingly small. This is attributed in part to the high cost of the prepared sizes.

ST. LOUIS

Market Unusually Quiet, with a Little Demand for Cheapest Grades—Steam Fairly Active—Shippers Cut Prices.

The St. Louis situation shows some little improvement in demand for screenings for steam. Nothing indicates any similar activity in the country sections, except that a fairly good tonnage is moving to Chicago.

There is some activity in retail circles on Standard lump, which is the cheapest grade sold, but most of the orders are small. Mt. Olive business and Carterville are unusually slow.

Dealers' yards are loaded with Mt. Olive and Carterville coal and some of them fear they are not going to move it this winter.

The movement of anthracite, coke, and smokeless is unusually slow. This trade is expected to pick up soon.

Business that has been moving in the past to Omaha has slowed up and reports from Kansas City show a glutted market which bars shipments from St. Louis.

Retail prices range from $7.50@$7.75 for Carterville; $6.50@$6.75 for Mt. Olive and $5.50@$5.75 for Standard.

COLUMBUS

Snappy Weather Wakens Domestic Demand — Retail Prices Grow More Stable—Buying Is Frequent but Small.

A slight increase in domestic demand has developed from lower temperatures. Steam grades are still quiet with the exception of screenings which show considerable strength. Production continues low.

Lower temperatures have stimulated the domestic market to a certain extent, but not enough to cause any great movement. Retailers are buying more freely, but are inclined to clean up before doing much ordering. Retail prices have become more stable, although there is no decided upward movement. Hocking lump is selling around $5.75@$6.25 and West Virginia splints, $6.75@$7.50, depending upon preparation. Pocahontas lump is selling around $9, while anthracite is quoted $14.50@$15.

Consumers are buying more freely but orders are generally small. Dealers have been making deliveries promptly as orders have not accumulated much.

Steam trade is still quiet, outside of screenings which are quoted $1.25@$1.50. This is caused by the marked reduction in lump production, making screenings scarce. Many large steam users which have their power plants equipped with crushers are buying mine run for crushing. Public utilities are still the steadying effect on the steam trade. Railroad requisitions are not large. Most of the hospitals, schools, and public institutions have been supplied. Little improvement in the steam trade is expected during the coming month or six weeks.

Production is still low and no improvement is expected until steam consumers resume operations to a large degree. Many manufacturers suspended during the holiday week. In the Hocking Valley the output is about 15 to 18 per cent of normal.

CLEVELAND

Labor Developments Dominate Market Outlook—Buying Still Narrow—Business Upturn Expected.

The coal trade in this district is centering its attention upon the labor developments and the probable market consequences. In many quarters it has been felt for some time that a strike was inevitable and the recent action of operators in the southern Ohio and the Pennsylvania regions in breaking off relations with the unions has caused the feeling that breakers are ahead.

As a result the trade sees clearly an upturn in demand for fuel beginning probably next month. If industrial activities pull out of the lull the outlook for higher prices, at least temporarily, is good. Many operators will welcome such an advance as it would give them the first chance they have had in months to recoup the losses they have been suffering.

Industrial leaders welcome the coming showdown on mine wages holding that the present prices for coal are due to unadjusted wages. Once this matter is settled and coal prices are on a stable basis, forward buying of coal is expected to begin. In the meantime buying is still hand-to-mouth and no spurt is expected soon. The colder weather has helped the retail trade to some extent.

Receipts of bituminous coal for the

week ended Dec. 24, for industrial concerns and retailers, show a significant increase over figures of the preceding week. The total was 1,112 cars, 820 of these for industries and 292 for retail dealers, as against a total of 930 cars the previous week.

CINCINNATI

Holiday Season Brings Some Encouragement—Spot Prices on Slack Rise Slightly—Southeastern Kentucky and Nearby West Virginia Mines Work Haphazardly.

The holiday season, usually a bugbear brought a little ray of sunshine in the coal business here. Enough coal is moving to keep the market on edge and only enough slack is coming through the gateways to make the buyer who was not prepared for a fore-shortening of the domestic production pay an increased spot market price.

Smokeless is a little firmer though the top, $3.50 for lump and egg, is a bit hard to get. Much of the accumulation at the distributing yards of the Norfolk and Western has disappeared. Local demand is still indifferent. Mine run is in supply sufficient to meet the ordinary calls.

Bituminous offerings have been large enough to care for the spot buyer, though the price of screenings went up to $1.35 with $1.50 asked by some firms. Southeastern Kentucky mines are still working haphazardly, the largest producers turning out the smallest tonnage known in years. Logan County and Kanawha district in West Virginia also have small tonnage. Lump and block is still going begging. Mine prices are shown in the Weekly Review.

Retail business, locally, moves slowly. Some retailers are making lower prices, though the bulk of them are still trailing with the values set Dec. 1. Smokeless lump brings $8.75@$9, mine run $6.75@$7.25, slack $6. Bituminous lump is $7@$7.25, mine run $6@$6.25 and screenings $4@$5.

West

DENVER

Production About Equal To Last June's—Total To Dec. 1 is 2,776,000 Tons Behind 1920—Wages Going Down.

Weekly tonnage at the end of December dropped to that of June, or about 125,000 tons. Only within the last two weeks in the closing month of the year has cold weather prevailed. Production to Dec. 1, 1921, amounted to 8,483,466 tons as compared with 11,260,407 tons during the corresponding time in 1920, a decrease of 2,776,941 tons.

Resumption of operations in the Pueblo steel mills will help to bolster up mine operations to a certain extent. There is no change in prices, at the mine or in retail markets, where bituminous is selling for $1 less than a year ago. Lignite is also a little under last year's price.

Reduced wages is the price paid by Gunnison County miners, in the semi-anthracite field, for a sympathetic strike in protest against the Colorado Fuel & Iron Co.'s wage cut in the southern bituminous fields.

The 33 per cent cut in wages applied only to certain bituminous mines. Officials in the Gunnison County district declare that when the mines reopen wages will be reduced there.

SALT LAKE CITY

Business Again Lags — Cold Weather Needed—Traffic Movement Slows.

Dealers are marking time once more and things are correspondingly quiet in operating circles.

The president of the local retailers' association states that he believes Salt Lake City consumers have not more than 25,000 tons of coal in their bins and he estimated the amount in the yards as about 75,000 tons. The coal traffic over Soldier Summit has dropped to only 100 cars a day.

South

LOUISVILLE

Retailers Cut Prices to Meet Competition From Snowbirds—Prices Are Going Down — New Business Expected Early This Year.

Louisville retailers in meeting competition of snowbirds in some instances have cut retail prices a dollar a ton. They are rather disgusted with the general situation.

Snowbirds in Louisville have been steadily cutting the price until some eastern Kentucky lump is selling at $6.75, as against $8 a month ago. Some of the larger retailers have just announced reductions to $7 on this grade, while some western Kentucky lump is selling at around $5.75@$6.

Some of the large retailers with 10,000 to 20,000 tons of coal in their yards that cost as much as 50c. to $1 a ton over present levels at the mines, are considerably worried, especially as there is prospect of lower prices at mines, and the probability of reduction in freight rates shortly after the first of the year. Retailers must unload or carry over stocks until next summer. Severe weather might help clear up the situation.

Jobbers in some instances expect more business now, as it is believed that industrial stocks have been allowed to run very low until after inventory.

One jobber-operator remarked that railroads are taking only 50 per cent of minimum contract requirements. This indicates industrial concerns are using far less than the usual quantity of coal.

Many coal men anticipate retail prices of $5.50 to $6 on best grades of lump coal if wages and freight rates are reduced.

BIRMINGHAM

Market Still Sleeps—Holiday Depresses Demand—Domestic Grades Reduced at Mines—Steam Prices Stationary.

The trade, which has been so acutely dull here for the past two months, of course was not expected to take on any change for the better during Christmas week, and no improvement of note will likely be shown early in the new year. There is little inquiry and aggregate sales are small.

Reductions in mine prices on lump and other domestic sizes were made by a number of producers, ranging from 25c. to $1 per ton, following cuts put in a fortnight ago by retail dealers in the Birmingham district. The thermometer reached the ice-making stage several days the past week, followed by a rise in temperature and rains, and is again dropping.

Mine prices on the several grades of steam and domestic coal are as follows:

	R/M	Washed	Lump and Nut
Big Seam	$1.90@2.30	$2.00@2.30	$2.75@4.00
Carbon Hill	1.90@2.25	2.50@2.85	4.00@4.25
Cahaba	2.25@2.75	2.50@3.15	4.50@5.50
Black Creek	2.50@2.75	2.50@3.00	4.50@5.00
Corona	2.25@2.50	2.75@3.00	4.00@5.00
Pratt	2.25@2.50		

Production for Christmas week was the lowest of the year, hardly reaching 200,000 tons. The bulk of this was produced by furnace companies for use in coke manufacture. From present indications the output for the year will be approximately 12,000,000 net tons or about 5,000,000 tons short of 1920.

Southwest

KANSAS CITY

Soft Weather Leaves Market Lifeless—Mines Working 10 or 15 Per Cent Full—Prices Firm.

The temperature went down to nine degrees above zero this week, but like the market for coal, it did not stay put and is now unseasonably warm and demand fell off sharply.

Strikes continue to hamper the operators in the Kansas coal field. Only about 10 to 15 per cent of mine capacity is being utilized and there is no market for all that is being produced. The real buying power in this section of the country is largely dependent on the prosperity of the farmers and cattle-raisers who are buying little now.

No material change in prices has taken place this past week and prices quoted, f.o.b. mines, are as follows: Kansas lump, $5; mine run, $4@$4.25; nut, $4.50; mill, $2.75; slack, $2.50; north Missouri lump, $4.25; mine run, $3.50; washed slack, $3.75; raw slack, $2.50; Arkansas lump, $7.50; mine run, $3.75@$4.25; slack, $2.50@$2.75; McAlester Oklahoma lump, $8.50; nut, $7; slack, $2.50.

Canada

TORONTO

Dealers Doing Fair Business—Large Stocks on Hand — Bituminous Market More Settled.

Conditions are practically unchanged. Business which is usually quite active at this season in only fair. The domestic demand varies with the weather and orders are mostly for small lots. Dealers have ample supplies in the yards and shipments show some falling off.

The industrial demand for bituminous continues light. Surplus supplies are being gradually disposed of and the market is becoming more settled, with less price-cutting. Quotations are as follows:

Retail:	
Anthracite egg, stove, nut and grate	$15.50
Pea	14.00
Bituminous steam	10.25@10.75
Domestic lump	12.00
Cannel	11.00
Wholesale, f.o.b. cars at destination	
3-in. lump	7.00@7.75
Slack	6.00@6.75

News From the Coal Fields

Northern Appalachian

PITTSBURGH

District Follows Southern Ohio out of Central Competitive Field—Operators Ready to Buck National Union Officials—Wage War Brewing—Gas Slack Is Stronger.

The Pittsburgh Coal Producers' Association sent a letter to President Lewis of the United Mine Workers on Dec. 28 stating briefly that they saw "nothing beneficial to the public or the coal industry" in the meeting proposed by Mr. Lewis to arrange for a conference on a wage agreement for the central competitive field and stating that they declined to meet. The day previous, the operators of southern Ohio announced a similar decision. It may be taken as established that the operators will no longer act in a body as the central competitive field. Much evidence to prove this has come out. The great majority of the operators are opposed to continuance of the check-off and thus there are two great issues joined apart from the general subject of wage rates and working conditions.

A fair guess is that, the central competitive field having gone to pieces, the operators of the Pittsburgh, Freeport, Butler-Mercer and central Pennsylvania districts will act in harmony in the matter of wage scale negotiations, and will be prepared to negotiate with the district organizations of the United Mine Workers rather than with the national body. No one in the trade appears to doubt that the U. M. W. will endeavor to bring about a general suspension at all mines in the country it has controlled, to preserve the check-off and the method of collective bargaining hitherto observed.

The market continues very dull. The only change was an additional improvement in slack prices, particularly on gas. Slack has been a drug on the market, being produced of necessity in filling orders for screened coal and has in essense been sold to the highest bidder. Mine run and screened prices remain practically nominal asking prices, while in Panhandle lump there is, as usual, an actual trading market. Operations are perhaps lighter than two or three weeks ago.

EASTERN OHIO

Production Starts Upgrade, but Only to Replenish Stocks — Railroads Take Bigger Proportion—Strike May Start April 1.

The closing days of the year find industrial activities somewhat diminished, but the volume of mining in the eastern Ohio field for week ended the 24th gained slightly. Total output was 280,000 tons or 45 per cent of potential capacity—5,000 tons above last week.

Operators say, however, that this was only the result of an effort to close the week with some unbilled coal on track in anticipation of orders over the week-end double holiday.

Those prominent in the trade state that inquiries from both industries and retailers have been negligible, and there is some holding off on orders for immediate shipment because of elimination of war tax on freight charges effective Jan. 1.

It is also asserted that at the present rate of production between 40 and 50 per cent of output is going to the railroads for fuel, as contrasted with the normal proportion of 30 per cent.

With the New Year at hand the trade hopes for a demand, particularly from industry. The consensus of opinion seems to be that the reserve stocks of fuel which were put in during late October and early November are now about gone. The steel industry and other manufacturers may resume larger operations thus creating a more active demand for fuel.

Labor troubles at the mines threaten. The refusal of operators of the southern Ohio (Hocking) field to discuss a new wage agreement with national officers of the United Mine Workers may precipitate a strike.

Owing to the smaller quantities of slack available during the past few weeks, due to slump in production of prepared sizes, the price on spot slack has experienced a further stiffening to $1.80 per ton. Spot prices on other grades remain about the same as previously quoted.

UPPER POTOMAC

Usual Holiday Idleness — Lowered Wages No Factor—Few Resumptions Until New Years.

There was the usual suspension of shipments to contract customers over the holiday period. There was no spot demand, even those mines where wages had been adjusted downward being unable to operate. It was becoming apparent that the market could not absorb any additional tonnage even with the low prices which were being made, and operations generally were closed down until after Jan. 1.

UNIONTOWN

Furnace Coke Contracts Get Keen Attention—Quotations Range From $3.25 to $3.75—Spot Market Sluggish.

Negotiations for furnace coke contracts continue to hold first attention. The closing of contracts is more significant this year because inquiring consumers will decide between beehive and byproduct coke. There are only about five furnace interests looking toward 1922 fuel requirements.

At the present time there is a wide range of quotations for furnace coke contracts from $3.25@$3.75. Some operators hold that most inquiries have been met with the minimum figure. Nothing has come to light about the price views of byproduct producers for furnace contracts.

Meantime the spot market is sluggish. Sales are being made in carload lots at $3 and even $2.75 is seen where quick disposal is necessary. Foundries are taking inventories and are not heavy buyers. A few sales are recorded at $3.75@$4.

The coal market is also inactive. Steam is quoted at $1.25@$1.40 with byproduct at $1.60@$1.75.

CONNELLSVILLE

Additional First-Quarter Contracts Closed—Byproduct in Keen Competition—Spot Market Quiet.

Last week two contracts for first-quarter furnace coke, the first of the season, were reported, at $3.25 and $3.40 respectively. Two additional contracts have since gone through, at $3.25 and $3.50. The price range presumably represents differences in quality. The contracting is entirely by furnaces having contracts expiring Dec. 31, but there is inquiry out against one furnace not now in blast, the Trumbull-Cliffs stack at Warren, Ohio, which may go in Jan. 15.

The spot market continues without any demand from furnaces, and a subnormal demand from the miscellaneous buyers. Coke prices are softer because of no demand. We quote: Spot furnace, $2.75@$3; contract furnace, $3.25@$3.50; spot foundry, $3.75@$4.50.

FAIRMONT AND PANHANDLE

Holiday Idleness Prevails — Sluggish Markets Continue—Slack Coal Only in Demand.

FAIRMONT

Christmas week was marked with the usual holiday idleness which was accentuated by poor market conditions. There was no spot buying and contract orders were either curtailed or suspended until the new year. Prices had gone to pieces, with the exception of slack which was firmer, owing to the growing scarcity.

NORTHERN PANHANDLE

Production was being maintained by railroad fuel loadings alone, which were greatly diminished as the traffic grew lighter. Commercial mines were not operating more than 25 per cent of capacity and spot demand was absolutely at a standstill. The bulk of the output went to Northern and Western markets.

ANTHRACITE

Cold Weather May Revive Demand—Holiday Sluggishness Prevails — Independents Hard Hit.

There is an indication of improvement in the coal market and some mines have commenced operations. The strike of eight of the Lehigh Valley Coal Co.'s mines has not yet been settled. The mines of the Glen Alden Coal Co. have been closed all week.

The few independents who are operating are not working more than a couple of days a week. Besides the general slackness due to the lack of demand the holidays affected the output.

CENTRAL PENNSYLVANIA

Year Closes with Extreme Dullness—Wage Reductions Vitally Necessary.

With an output that falls millions of tons behind the year 1920, the week just past rings down the curtain on one of the worst years in the history of the business. However, operators are looking forward with renewed hope and feel certain that one thing or another will set the machinery in motion again which will make 1922 a more prosperous year.

When the big decline took place in 1920, it kept on the toboggan and the first of 1921 found prices around $3. Quotations in January for Pool 1 were $4; Pool 9, $3.20; Pool 71, $3.30; Pool 10, $2.75; Pool 11, $2.40. These gradually declined until in the last week of the year, on the same grades of coal, the following prices were quoted: Pool 1, $2.85; Pool 9, $2.20; Pool 71, $2.25; Pool 10, $1.95; Pool 11, $1.65.

It is said that many operators are contemplating closing their mines and going back to the 1917 scale, while in some instances this has been carried out. The wage scale is to be fixed the latter part of March. It all remains to be seen whether the union and the non-union workers can get together during the year.

A few hundred men are on strike at present in Somerset County, owing to operators going back to the 1917 scale. Many mines find the going very difficult and are closed down. It is believed, however, with the transportation tax off and the supply on hand exhausted, there will be a short period of buying during January.

Middle West

SOUTHERN ILLINOIS

Domestic Condition Unusually Bad — Screenings Fairly Active — Colder Weather Needed — Holiday Idleness Cuts Production.

Instead of showing up better as colder weather advanced the Carterville field has developed into a most unfavorable situation. With the abolishing of the war tax on freight at the end of the year there is an inclination to hold off ordering. Buyers are not desirous of carrying heavy stocks over the inventory period because there is nothing to indicate that prices will be anything above what they are at the present time unless unusually cold weather sets in.

Were it not for the fact that railroads are taking some coal during the lull in order to keep their traffic up the condition would be a most precarious one. The scattered shipments of domestic go to all markets with no particular movement in any one direction. Mines are loaded with these sizes.

Somewhat similar conditions obtain in the Duquoin and Jackson County fields. Prices are on a par with those of the independents in the Carterville district. The Mt. Olive situation has apparently grown worse. Mines get one and two days a week. The St. Louis price on domestic is $3 and in the country, $3.75, with practically no country coal moving. No steam coal is available from this field on account of the poor working time and the fact that the small tonnage mined is covered by contracts, but screenings would sell at $1.75@$2 if they were available.

The Standard district is in bad shape on prices. Mines get from one to three days a week, depending upon their railroad contracts and their ability to move lump.

There is considerable dissatisfaction throughout all Illinois fields on the part of the miners and in several places single miners have been leaving for those of the non-union West Viriginia fields where full time work is reported.

WESTERN KENTUCKY

Southern Demand a Shade Better—Screenings Bring Good Prices—Retail Trade Inactive.

While there has been some little improvement the past few weeks in Southern movement, the general demand is poor, and retailers in the large markets are not buying any appreciable quantities of coal.

Screenings have been scarce and therefore high in price, with the market quoted right around the mine run low level. Screenings have been temporarily lower the past few days as a result of some large consumers having stopped shipments.

Some of the operators are of the opinion that there will be better industrial demand and heavier stocking shortly after the first of the year, but prospects for retail business are poor. Most retailers have a good deal of stock on hand and are not in a buying humor.

MIDWEST REVIEW

Market Remains Dormant in Spite of Ten Cold Days—Dock Cuts Affect All-Rail Business—Many Mines Closing.

The holiday season brought a period of inactivity in the coal market. Ten cold days failed to stimulate the domestic coal market.

Illinois and Indiana operators are encountering very stiff competition in the Northwest and from the docks at the Head-of-the-Lakes. Prices were reduced Jan. 1, f.o.b. docks, to such low levels that now it is possible to buy Eastern coal almost as cheap as southern Illinois or Indiana coal. This, of course, is going to make a tremendous difference to our operators who, up to now, have been enjoying a fair business in the Northwest.

It is believed that shortly after the first of the year an improvement will take place in the domestic demand. Freight rates on grains are reduced, and this will influence a large movement of grain to central markets. Farmers will thus be able to liquidate and, consequently, will be in more of a buying mood.

The industrial situation in the Middle West continues to be unsatisfactory. There was some activity during October and November and the early part of December, but those plants which opened up on a large scale have found that their plans were a little premature and, consequently, have curtailed their activities. The cement plants are buying coal, although their plants are not running. They are planning on accumulating a little surplus so they will be able to operate after April 1, even if a strike materializes. Unemployment remains about the same, or at best, shows little improvement.

The labor situation at the mines continues on an even course, with the men showing an inclination to work when opportunity for work occurs. One or two strikes of small importance occurred, perhaps the biggest one in Indiana, where a number of men went out because they claimed a pump-man had been discharged without sufficient reason. Down in southern Illinois a number of mines have been closed. Practically the entire staffs at these mines have been let go. In one of the biggest mines in the field which is down, only four men are left—two above ground and two below.

Reports of this nature will become more common, as operators have given up a useless battle against circumstances and have now decided, in some cases, to accept the policy of watchful waiting. When they close their mines they are at least protected against depreciating their property and selling their product at a loss.

Middle Appalachian

HIGH-VOLATILE FIELDS

Spot Market Inactive—Holidays Bring Suspension of Orders — Production Heavily Curtailed — Only Screenings in Demand.

KANAWHA

The general holiday suspension plus the lack of demand caused production to slump during Christmas week. Industries did not find it so easy to secure nut and slack but during the holiday season there was a lessened demand for that grade. Because of the growing scarcity of slack mine run had slightly improved its unsatisfactory position.

LOGAN AND THACKER

Hold-orders and cancellations were general during the week, making it apparent that the last ten days of December would be the dullest period of the year. Production was not over 40 per cent of capacity, most of the output going to Western markets. Domestic and mine run were draggy but slack was harder to obtain because of the growing scarcity.

Kenova-Thacker operators managed to keep production up to 70,000 tons, but a growing number of suspensions made it certain that the last week of the month would be a sluggish one.

NORTHEASTERN KENTUCKY

As in other fields, there was a general suspension of operations over the holidays. Contract business was curtailed and the spot demand was completely stagnant. It was impossible to move mine run or domestic sizes and the sale of screenings was limited by the low production.

VIRGINIA

Producers managed to keep up a 50 per cent output. Nearly all of this, however, was on contract, although there was a growing inquiry for spot slack. Mines not having contract business remained idle.

LOW-VOLATILE FIELDS

Hampton Roads Tonnage Reduced — Production Affected by Holidays—Sluggish Demand—Many Mines Closed.

NEW RIVER AND THE GULF

The operation of some New River mines on a non-union basis increased production but as the holidays approached there was a curtailment of work-time in response to many contract suspensions. Apathy prevailed in the spot market although slack was holding its own because of the growing scarcity.

Gulf production continued to decline, not being over 35 per cent of capacity. With the clearance of coal at the Hampton Roads piers the first of the year gave promise of a better movement of coal in that direction. Shipments to New England were going along fairly well but export business was entirely flat.

Pocahontas and Tug River

Pocahontas production was not more than 200,000 tons with "no markets" amounting to nearly 300,000 tons. The output was cut not only because of poor demand but because of the usual holiday lull. A small tonnage was flowing to Tide for New England but the bulk of the movement was to the West. The majority of the operations remained closed from Christmas to New Years.

Tug River production was lower than usual owing to the slackening of industrial activity. There was little spot demand even at lowered prices. What kept up production were the large consignments to Western steel companies as there was no Eastern movement worth mentioning. Prepared demand had broken to a very material extent.

Southern Appalachian

SOUTHEASTERN KENTUCKY

Miners Return to 1917 Scale—Some Resumption Anticipated—Market Unable to Absorb Much Additional Output.

Miners having accepted the wage scale of 1917, most of the operators announced their intention of starting up on Jan. 2 and some say they have business in sight that will guarantee a steady run for at least the first half of the month. Wholesalers, however, are not very optimistic. It is known that a great many users of steam have been working on their stocks during December in order to have them as low as possible for inventory and this should result in a better movement for January.

Domestic yards in the South are well stocked, mostly with coal costing from 50c. to $1 above current quotations and they, too, are working off stocks.

The 1917 scale of wages will enable southeastern Kentucky better to compete with West Virginia coals going North and East Tennessee and southwestern Virginia in the South.

News Items
From Field and Trade

ALABAMA

The interests which organized the Great Southern Steel Co. in Dover, Del., recently, are reported to be the same as the promoters of the **Alabama Land Syndicate, White Iron & Coal Co., Palatina Mining & Development Co.**, and one or two other corporations which bought up large acreages of coal and iron ore lands in Etowah, DeKalb, Marshall, St. Clair and Cherokee counties a few months ago. The properties which it is supposed will pass to the control of the new organization comprise about 101,000 acres acquired by Chicago capitalists and others, and 45,000 acres, which it is reported was purchased by Henry Ford. These lands are only about sixty miles from Muscle Shoals properties, which Ford is negotiating to obtain from the government. Charles E. Pain is reported to be counsel for the corporation and Robert W. Hunt, Chicago engineer inspected the properties and made a report on the extent of the mineral content.

COLORADO

Six men were killed by firedamp in the Satanic Mine of the **Colorado Collieries Co.**, near Morrison, when they attempted to place a bulkhead on the level of an abandoned shaft, used as an air course, to stop a fire which had been spreading for several days. James W. Graham, deputy state coal mine inspector, and a rescue crew from the Leyden Mine, in charge of Archie Gilchrist sought to revive the miners, but without avail.

ILLINOIS

The J. K. Dering Coal Co. has increased its capital stock from $200,000 to $3,000,000.

William D. Elstrom, former president of the Chicago Coal Merchants' Association, suffered the misfortune of a broken leg through a fall on the ice. His injuries, while painful, are not serious.

Recent visitors in the Chicago market included the following: **C. M. Wasson**, president of the Wasson Coal Co., Harrisburg; **James Forrester**, president of the Paradise Coal Co., Duquoin; **J. A. Templeton**, of the Templeton Coal Co., Glendora, Ind.; **Enoch Carver, Jr.**, vice-president and sales manager of the Cosgrove Coal Co., Johnstown, Pa.; **W. J. Spencer**, president of the Monmouth Coal Co., Brereton; **O. G. Scott**, secretary of the Central Illinois Coal Bureau, Springfield.

Advice from the **Consolidated Coal Co.** of St. Louis, which owns Mine 9, is to the effect that the mine property will be a total loss. Backwater from the Big Muddy River broke into the mine and within three hours filled the entire mine for a radius of more than a mile. Miners had not been working in the shaft for two weeks fearing such a danger. In years past when the river was high and backed up in low places over the mine, work was suspended.

Announcement has been made by A. F. DelValley & Sons, of Danville, that they will soon start sinking a new mine at that place. The firm, which has been operating in that vicinity for several years, has recently filed articles of incorporation under the name of **DelValley Coal Corporation**, capital stock $100,000, of which Alphonse DelValley, A. J. DelValley and A. L. DelValley hold $33,333 each. The new mine will be put in operation early in the year.

A deal was recently consummated whereby the **Perry County Coal Corporation** became the owner of 200 acres of undeveloped coal lands in Lebanon and O'Fallon townships, St. Clair County. New mines will be sunk in these two townships as the Illinois Terminal Railroad of East St. Louis has announced that it will extend its East St. Louis-Alton line into O'Fallon, giving the operators in the northern part of the county an opportunity of shipping coal direct to Chicago.

An action which has attracted attention in mining circles is that of the **Sangamon County Mining Co.**, operating at Lincoln, when it announced that a carload of coal would be given to each church in the city.

INDIANA

Norman S. Tighe, manager for the N. S. Tighe Coal Co., Fort Wayne, was placed under arrest recently on an indictment returned by the grand jury in which he is charged with having embezzled funds of the company in the amount of $238.

One of the largest operations ever opened in the state will start production of coal in the near future. **The Vulcan Coal Co.**, Evansville, has arranged for immediate installation of machinery. The company owns 1,205 acres of stripping land in Monroe Township, Pike County, about seven miles east of Oakland City. The board of directors consists of Aloys Herrdink, W. O. Sanders, D. C. Stephenson and J. J. Morris. The company is capitalized for $1,000,000.

Reassessment of coal properties in Vermillion County follow: The Ferguson-Spear Coal Co. and the Ferguson Coal Co., Clinton reduced from $183,895 to $108,280; Indiana & Illinois Coal Corporation, Clinton, total increased from $293,555 to $400,000; Clinton Coal Co., Clinton City, personal reduced from $69,055 to $1,555, and personal in Clinton Township increased from $164,655 to $258,255; Jackson Hill Coke & Coal Co., Terre Haute, personal increased from $12,870 to $115,755; Inter-State Coal Co., Terre Haute, Clinton Township, personal increased from $30,900 to $44,420; Tighe Coal Co., Terre Haute, Clinton Township, total increased from $53,945 to $110,790; West Clinton Coal Co., Terre Haute, Clinton Township, total increased from $71,310 to $84,000.

Reassessment of coal properties in Knox County include Columbia Coal Co., Bicknell, personal increased from $78,620 to $85,000; Ridge Coal & Mining Co., increased from $48,450 to $134,530; Oliphant-Johnson Coal Co., Vincennes, Washington Township, personal increased from $94,365 to $295,280; Vincennes, personal increased from $1,000 to $10,790.

Changes of assessments in Owen County include: Rowland-Powers Consolidated Collieries Co., Terre Haute, Marion Township, personal increased from $25,000 to $28,625, and Stewart Coal Co., Patricksburg, increased from $100,230 to $105,255. Parke County assessments were not changed.

The Spencer Coal Co., Sullivan, has filed a final certificate of dissolution.

KENTUCKY

In an opinion handed down recently, the Court of Appeals affirmed the action of the Kenton Circuit Court in issuing mandatory instructions for acquittal of the **Hatfield Coal Co.** of Covington of charges of conspiring to fix and control prices in Covington.

Howard Holtzlaw, auditor of the Colcord Coal Co., of Charleston was at Sanford, during the early part of December, having been called there to attend the funeral of a relative.

J. P. Kelly has sold the **Kelly Coal Co.**, Hickman, to Steve Stahr, of Hickman, who will operate the business as the **Stahr Coal Co.**

An increase of $250,000 in the capital stock of the **North Jellico Coal Co.** has been determined upon by W. S. Speed, president and director of the company, and F. M. Sackett, a director, who hold more than two thirds of the corporations stock.

Stockholders of the **Ashland Iron & Mining Co.**, voted unanimously to accept the proposition of the **American Rolling Mill Co.**, Middletown, Ohio, to buy the entire holdings of the mining company, including the **Ashland Coal & Iron R.R.** and the acreage of coal land along its line. The deal involves approximately $13,000,000 and is the largest ever closed in eastern Kentucky.

NEW YORK

Harvey B. Prescott is calling on the Northern New Jersey coal consumers for Pilling & Co., New York City. Until recently, Mr. Prescott had charge of the Pittsburgh office of W. J. Rainey.

M. L. Taylor, vice president of the Morgantown & Wheeling Coal Co. was in New York early last month on business.

Edward T. Bedford, President of the Corn Products Refining Co., has been elected a member of the board of directors of Pattison & Bowns, Inc., of New York City, to fill the vacancy caused by the resignation of **Merwin W. Bricker**. The board of directors has placed its preferred stock on a dividend basis. Two dividends were declared each at a rate of $2 per share.

C. H. Mead of the Mead-Tolliver and other smokeless companies in southern West Virginia, was in attendance at the meeting of smokeless operators early in December.

P. M. Snyder, of the New River field, was a New York visitor during the early part of December, being in attendance at the sessions of the Smokeless Coal Operators' Association.

E. E. White, president of the E. E. White Coal Co. of Glen White, W. Va., attended the meeting of smokeless operators in New York early in December.

W. Gaston Caperton, well-known in Winding Gulf coal circles, spent a few days in New York during the early part of last month.

OHIO

Several smokeless operators were in Cincinnati Christmas week, among whom were **J. J. Tierney** of the Crozier-Pocahontas Co., Philadelphia; **Harry Caperton**, New River Coal So., Charleston, and **O. M. Deyerle**, Flat Top Fuel Co., of Bluefield, W. Va.

John Glaser, sales manager of the Tribbey Coal Co., Cincinnati, has returned from a trip to the Northwest and Chicago.

George Coffey, president of the War Eagle Coal Co., of War Eagle, W. Va., has returned home after a siege in Christ's Hospital, Cincinnati, where he underwent a serious operation.

The Cleveland & Western Coal Co., owning a large tract near Powhatan, plans to spend $1,000,000 in opening the field. The program calls for a shaft and tipple in addition to 200 houses.

E. S. Helburn, of Middlesboro, Ky., who operates seven mines in southeastern Kentucky, was in Cincinnati recently consulting with the officers of the Kentucky Fuel Co., who sell his output.

Tom Morgan, sales agent for the Webb Fuel Co. is prominently mentioned as the choice of the directors for the presidency at their meeting to be held in January.

Arrangements have just been completed by the **American Mining Congress** to hold its 1922 convention in Cleveland, Oct. 9 to 15. The convention will be held in the new Exposition Hall which is being built by the City of Cleveland at a cost of $6,000,000. This will be the first national show to be held after the completion of the new edifice.

Ernest Chilson, vice-president and general manager of the Raleigh Coal & Coke Co., with headquarters at Raleigh, was a visitor at the general offices of the company in Cincinnati during the latter part of December.

Herman Everett, sales manager of the Smokeless Fuel Co., having his office at Charleston, spent a few days in Cincinnati the latter part of December.

PENNSYLVANIA

A charter has been issued to the **West Point Marion Coal Co.**, Point Marion. The capital stock is $160,000 and Myrtle M. Sterling, Dillinger, is treasurer and one of the incorporators, the others being John B. Moore, Point Marion, and Harold M. Conn, Dillinger. The purpose of the corporation is mining, producing and marketing coal.

The Mason-Heflin Coal Co. has notified the State Department at Harrisburg of an increase in its capital stock from $66,400 to $68,900, John T. Heflin, treasurer, Philadelphia.

R. W. Stone, for many years a member of the geologic staff of the United States Geological Survey, has resigned to accept a position as assistant state geologist of Pennsylvania.

The International Coal Corporation, Philadelphia, has notified the office of the Secretary of the Commonwealth of an increase in capital stock from $49,800 to $65,800. H. S. Goodwin, Philadelphia, is treasurer.

The Consolidated Coal & Coke Co., Butler, has increased its capital stock from $474,600 to $486,200; A. M. Christley, treasurer.

Recent state charters have been issued to the following coal companies: **Coal Dredging Co.**, Philadelphia; capital stock, $10,000; treasurer, J. B. Townsend, 3d, who with H. M. Blake and W. L. Fox, Philadelphia, incorporated the company. **Cairnbrook Coal Mining Co.**, Windber, $60,000; purpose, mining and preparing coal for the market; incorporators, Frank Lowery, treasurer, Windber; J. E. Reese, Scalp Level and E. M. Mack, McKeesport. **Steel City Gas Coal Co.**, Pittsburgh, $100,000; purpose, mining and producing bituminous coal; incorporators, Frank E. Weiss, Bridgeville, treasurer; F. C. Whatley, Pittsburgh, and Scott H. Braznell, Wilkinsburg.

The Combustion Engineering Corporation announces the opening of a branch office in the First National Bank Bldg., Pittsburgh. This office is in charge of W. C. Stripe, formerly manager of the Philadelphia office.

William P. Boland, a well known Scranton operator, has purchased twenty-three acres of coal land in Upper Pittston, from the Isaac Felts estate. Mr. Boland announces that he is going to sink a shaft on the west side of the main line of the Lehigh Valley tracks. Operations will start in the near future.

A. G. Smith, of Meyersdale, who is connected with the Smith Brothers Coal Co., was a visitor in Clarksburg, W. Va., early in December.

Announcement has been made by **J. Earl Myers**, well known in West Virginia coal circles, of his resignation as sales manager of the Westmoreland Fuel Co., to form the **J. Earl Myers Co.**, with headquarters at Pittsburgh.

UTAH

A full course in coal mining is to be given at the **University of Utah**. This is the first time such a course has been available in the state. Prof. R. N. Lewis will be in charge of the course.

Alexander H. Cowie, general manager of the Utah Fuel Co., at Salt Lake City, for the past fifteen years, will be succeeded by **A. R. Baldwin**. Mr. Baldwin is president of the Western Pacific R.R., which is said to own all the stock of the coal company. The Utah Fuel is the oldest coal company in the state. It is believed that Mr. Baldwin's management of the company will be but temporary.

VIRGINIA

The Norfolk office of the **New River Coal Co.**, A. G. Ayers, manager, was closed Jan. 1. Mr. Ayers will go to the Richmond office of the company.

Arrangements have been made to keep open the Norfolk office of the **Central Pocahontas Coal Co.** This office was scheduled to have been closed in December.

WASHINGTON, D. C.

The United States Civil Service Commission announces an open competitive examination for statistician (financial). Vacancies in the Treasury Department, Washington, D. C., and in positions requiring similar qualifications, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion. Receipt of applications to close Jan. 24, 1922.

In a recent speech in the House, Representative Black of Texas, said that wages must be adjusted in accordance with prices. He referred to the fact that groups of highly organized labor in the coal mines had resisted efforts to lower wages to any appreciable degree on the ground that labor is not a commodity and should not respond to conditions affecting commodity prices. The congressman, however, insisted that wages and profits are interwoven in the prices of commodities and should be adjusted.

Attorney General Daugherty has asked the attorney generals of the various states to co-operate with the Government in maintaining reasonable retail prices on fuel and foods. He urges enforcement of fuel supply laws, among others, in their relation to prices.

The Bureau of Standards in its annual report says that last year 231 coal mine scales were tested as to accuracy of weight, 177 of which were found incorrect. Fifty-seven per cent of the incorrect scales were in error more than 1 per cent and 7 per cent of the incorrect scales were in error more than 5 per cent. The Bureau allows a tolerance of .4 per cent.

WEST VIRGINIA

Equipment for the screening of coal on a larger scale has been arranged for by the **Opperman Coal Co.**, which operates near Blair on the Coal River branch of the Chesapeake & Ohio. This company will install a three-track shaker screen, together with picking tables and loading booms.

D. T. Quinn, who is identified with the Daniel Howard Interests in Clarksburg, has returned to his headquarters at Clarksburg after an extended Western trip.

J. E. Long of the J. E. Long Coal Co., of Clarksburg spent a week or more at French Lick Springs about the middle of December.

Joseph M. Burns, who has been connected with the firm of Daniel Howard & Co., at Clarksburg, has gone to Wichita Falls to assume charge of the office there of the Wilson Hydraulic Casing Pulley Machine Co., Daniel Howard and others of Clarksburg being financially interested in this company.

A. J. Salzer, general manager of the Southern Coal Corporation of Fairmont was in Pittsburgh and Ohio markets during the early part of December.

State Senator Gohen C. Arnold, of Buckhannon, interested in the Empire Fuel Co., was in Elkins, early in December in connection with the trial of a suit by the Empire Co. against the government.

The organization of the **Logan Coal & Lumber Co.**, has been perfected by the election of the following officers: Lee Ott, president; M. L. Garvey, vice-president; A. C. Minear, secretary and treasurer. The company plans the beginning of development work about the first of the year. It will be necessary for the company to build a bridge over the Guyan River. Operations will be in the Island Creek seam.

Negotiations have been consummated for the sale of two mining properties on Loop Creek in the New River field. **The Sugar Creek Coal & Coke Co.**, in which A. J. King of Huntington and his associates were the principal stockholders, has passed to the control of Theo. Deitz and associates of Charleston. This operation ranks as the second oldest on Loop Creek, the mine having been in operation for a quarter of a century. Operations will be in charge of Leslie Sydnor, who was formerly connected with one of the sales agencies at Huntington. The new name chosen following a change in ownership is the **Sugar Creek Coal Co.**

A lease of about 65 acres near Harvey, operated by the **Dewitt Fuel Co.**, has been acquired by **Thom. Clapperton** of Logan County, formerly of Winden and his associates, and operations will be under his personal direction. This property is a comparatively new one, having been first operated by Thomas Snyder, who sold it to Huntington men for approximately $100,000.

Sitting as arbitrators in the $200,000 damage suit of the **New River Collieries Co.**, against the **Sugar Creek Coal Co.**, Messrs. Cunningham and Thomas have awarded $12,096 to the plaintiffs. The arbitrators found that the Sugar Creek company in 1917 and 1918 trespassed, not intentionally nor deliberately, on the coal seam belonging to the Sun Mine and mined 3,531 tons of coal from the barrier pillars, the value of which has been fixed at $3,531. The arbitrators have further found that because of the removal of the barrier it will be necessary for the plaintiff to leave 4,230 tons of coal for new pillars the value of which has been fixed at $1,000. Concrete dams and walls to protect the Sun Mine from water are estimated as costing $7,025. The cost and expenses of the arbitration were $540, bringing the total amount to be paid the New River Collieries to $12,096. The finding of the arbitrators is final.

BRITISH COLUMBIA

OUTPUT FOR NOVEMBER, 1921

	Tons
Vancouver Island District	
Canadian Western Fuel Co., Nanaimo	47,758
Canadian Collieries (D) Ltd.	
Comox	27,291
South Wellington	8,703
Extension	14,630
Nanoose Wellington Collieries	6,560
Granby Consolidated M. S. & P. Co.	22,663
Old Wellington (King & Foster)	371
Total	127,976
Nicola-Princeton District.	
Middlesboro Collieries	4,991
Fleming Coal Co., Merritt	2,210
Coalmont Collieries, Coalmont	10,146
Princeton Coal & Land Co.	2,470
Total	19,817
Crow's Nest Pass District.	
Crow's Nest Pass Coal Co.	
Coal Creek	45,102
Michel	31,703
Corbin Coal & Coke Co.	10,202
Total	87,007
Total for November	234,800

NOVA SCOTIA

D. H. McDougall, vice president of the British Empire Steel Corporation, denies that the proposed wage reduction of itself and its associates, effective Jan. 1, violates the industrial disputes act, declaring that notice of the reduction was sent Oct. 29 to the secretary of the union and published in the newspapers, and that in consequence ample notice had been given. The Montreal agreement under its terms ends Jan. 1.

ONTARIO

F. A. Fish, head of the F. A. Fish Coal Co., Toronto and Pittsburgh, who has been in charge of the Pittsburgh office since the death of the late manager there, spent Christmas with his family in Toronto.

David White, chief geologist of the United States Geological Survey, delivered a lecture on "The Origin of Coal and Petroleum," recently before the Royal Canadian Institute at Toronto.

Traffic News

The I. C. C. has given notice of its rejection of the supplement to freight rates of railroads operating between Utah and Pacific Coast points which would have reduced the tariff on bunker coal from $7.25 to $6 per ton from Utah mines to San Francisco and Oakland. The supplement was intended to aid in the efforts which are being made by Utah operators in regaining the harbor coal trade.

The I. C. C. has suspended from Dec. 24, 1921, until April 23, 1922, the operation of certain schedules published in Supplement No. 13 to **Missouri Pacific Railroad Co.**, tariff I. C. C. No. A-4891. The suspended schedules provide reductions in the rates on bituminous coal from mines on the Missouri Pacific in southern Illinois to destinations in Arkansas and Louisiana.

In the complaint of the **Bellnite Co.**, an examiner recommends that the rates on pea, slack, and screenings coal from Acme, Alger, and Dietz, Wyo., to Ardmore, S. D., are unreasonable.

The Northwestern Traffic & Service Bureau of Minneapolis has complained against unreasonable rates on soft coal from Manitowoc and other Wisconsin points to points in Wisconsin, Minnesota, Iowa, the Dakotas and Nebraska.

The commission, on petition of various coal operators in Missouri, has reopened the case involving intrastate rates on coal in Missouri, and assigned it for hearing Jan. 6, at St. Louis.

In the complaint of the **Melcroft Coal Co.**, an I C. C. examiner recommends that the rates on coal from Melcroft, Pa., to Jersey City, for Erie delivery are unreasonable.

In the complaint of the **Walrath & Sherwood Lumber Co.**, an examiner recommends that the through rates on hard coal from Itasca, Wis., to Mt. Clare, Neb., and on coke from St. Louis, Woodward, Ala., and Youngstown, Ohio, to destinations in Nebraska are not unreasonable.

The Interstate Commerce Commisson has suspended schedules of the L. & N. and the C. & O. in which those carriers proposed to make reductions on coal from mines on their lines in eastern Kentucky and western west Virginia to destinations on the Southern in Indiana and Illinois, ranging from 17c. to 66c. per ton. The schedules have been suspended, pending inquiry, until April 24.

In the complaint of the **Illinois Coal Traffic Bureau**, the organization has submitted a brief to the I. C. C. requesting rates on bituminous coal from its southern Illinois mines to Omaha district territory which are made by use of a differential of 22½c. over the Belleville district rates. The railroads in a brief say this cannot be done unless the commission restores the whole differential basis in effect prior to the war increases. **The Lincoln Chamber of Commerce**, which has intervened in the case, asks for rates on fine coal from Illinois groups to Lincoln which do not exceed by more than 20c. a ton the rates to Omaha.

The United States Railroad Administration has reported the following final settlements with railroad companies: Nashville, Chattanooga & St. Louis Ry. $700,000; Woodstock & Blocton Ry. Co., $19,000; High Point, Randleman, Ashboro & Southern Ry. Co., $25,000. The payment of these claims on final settlement is largely made up of balance of compensation due, but includes all other disputed items as between the railroad companies and the administration during the twenty-six months of Federal control.

In the complaint of the **Milwaukee Association of Commerce**, relating to rates on hard and soft coal from Duluth and Superior as compared with those from Milwaukee, the I. C. C. has authorized the Central Illinois Coal Traffic Bureau, the Commerce Association of Aberdeen and the Minnesota Byproduct Coke Co. to intervene. The case will be heard by a representative of the commission at Milwaukee, Jan. 30.

The City of Detroit in a brief to the commission in its case asks for reparation on coal from Holden, W. Va., to Toledo, via barge to Detroit. The railroad contends there was no damage to the complainant and that the reduction in the rate from $2.11 to $1.83 does not justify an award of reparation.

In the complaint of the **West Kentucky Coal Bureau** the commission decides that the rates on bituminous coal from mines in western Kentucky on the Illinois Central and Kentucky Midland to points in the southern peninsula of Michigan are not unreasonable, but are prejudicial and prescribes that by March 18 the roads shall establish joint rates which do not exceed by more than 25c. a ton the rates maintained from mines on the Illinois Central in the southern Illinois group to the same destinations.

In the complaint of the **Mathieson Alkali Works, Inc.**, an examiner recommends that rates on coal from mines on the N. & W. in the Pocahontas, Thacker, Kenova and Clinch Valley districts, the C. C. & O. Ry., in the Clinchfield district and the Southern Ry., in the Black Mountain district to stations on the N. & W. and connecting branches between Roanoke, Va., and Bristol, Va.-Tenn. should be readjusted.

In the compaint of the **Lackawanna Steel Co.**, an examiner recommends that switching charges of $10.50 a car on bituminous slack coal during Federal control between mines and washing plants at Ellsworth, Cokesburg and Bentleyville, Pa., were unreasonable but that claims for reparation on certain shipments are barred by the statute of limitations. The examiner holds that the rate should have been $5 a car.

The Sewell Valley Railroad has been authorized to issue $110,000 of first mortgage 5 per cent gold bonds, to be sold for reimbursing T. W. Paine for advances made for the purchase of twenty-five coal cars.

Oral argument will be heard by the commission in Washington in January in the case involving reduced rates on coal to Kansas City, Mo.

The I. C. C. has assigned for hearing at Louisville on Jan. 18, the complaint of the **West Kentucky Coal Bureau.**

Recent Patents

Method and Apparatus for Washing Coal, Concentrating Ores and Minerals. Thomas M. Chance, Philadelphia, Pa., 1,392,399. Oct. 4, 1921. Filed Aug. 27, 1917; serial No. 188,430.

Method and Apparatus for Classifying Materials. Henry M. Chance, Philadelphia, Pa., and Thomas M. Chance, Baltimore, Md., 1,392,401. Oct. 4, 1921. Filed July 8, 1918; serial No. 243,911.

Mining-Machine Truck. Nils D. Levin, Columbus, Ohio, assignor to The Jeffrey Mfg. Co., Columbus, Ohio, 1,392,835. Oct. 4, 1921. Filed Nov. 21, 1916; serial No. 132,682.

Front Head for Rock Drills. L. C. Bayles, Easton, Pa., assignor to Ingersoll-Rand Co., Jersey City, N. J., 1,393,072. Oct. 11, 1921. Filed July 6, 1920; serial No. 394,193.

Hoisting and Conveying Machinery. Christian W. Aveling, Elgin, Ill., 1,395,077. Oct. 25, 1921. Filed Nov. 3, 1919; serial No. 335,431.

Obituary

David Purseglove, St. Clairsville, Ohio, 40 years old, one of the leading coal operators in eastern Ohio and West Virginia, is dead. He was found hanging by a rope in the cellar of his home. Despondency over ill health is believed to have prompted the act.

Charles A. Olson, president of the Olson & Van Allen Coal Co., Chicago, died recently at his home in Beverly Hills, near Chicago. He was 51 years of age. He had been prominent for years in Masonic circles.

Association Activities

Winding Gulf Operators' Association

Arrangements are being made for the annual meeting of the Winding Gulf Operators' Association, which is to be held at The Greenbrier's White Sulphur Springs, on Jan. 10. At this meeting officers will be elected and other important business disposed of. Upon the conclusion of the business session a social meeting will be held in the nature of a luncheon. Men prominent in the life of the nation have been invited to be present and make addresses.

Northeast Kentucky Coal Association

The annual meeting of the association is to be held at the Ventura Hotel at Ashland, on Jan. 17, the business session to be followed by a banquet. A large attendance is expected. The principal address will be delivered by J. D. A. Morrow, vice-president of the National Coal Association. He is to speak on the value of associations to coal men. The association is lending its moral support to the program of good road building in northeast Kentucky, many of its members being identified with the Lonesome Pine Trail Association. The association is also backing the first-aid work in the state and is urging members to train first-aid teams to participate in the state contest next year.

Clarksburg Coal Club

At the last meeting of the Clarksburg Coal Club addresses were made by A. Lisle White of Clarksburg, Uncle Dan Howard of the same city, H. E. Smith and by Alfred Beam of Elk Garden. Mr. Beam described conditions existing on the Western Maryland in the Upper Potomac region, stating that a number of mines in the Elk Garden section had gone on an open-shop basis.

Coal Merchants' Association of New York

At the annual meeting of the association, held on Dec. 12 at 90 West St., N. L. Stokes was elected president; Henry J. Lange, vice-president and Joseph M. Vought, commissioner. Mr. Vought, who has been deputy commissioner of the association for several years, succeeds Arthur F. Rice who has been ill since early last January and is now in California recuperating.

Coming Meetings

American Wood Preservers' Association will hold its annual meeting on Jan. 24, 25 and 26 at the Hotel Sherman, Chicago, Ill. Secretary, G. M. Hunt, Madison, Wis.

American Institute of Electrical Engineers will hold its midwinter convention in New York City, Feb. 15, 16 and 17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Institute of Mining and Metallurgical Engineers will meet on Feb. 20 to 23 in New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

The American Institute of Consulting Engineers, Inc., will hold its annual meeting Jan. 16, 1922, at the Engineers' Club, 32 West 40th St., New York City. Secretary F. A. Mollitor, 35 Nassau St., New York City.

New England Wholesale Coal Association will hold its annual meeting Jan. 10, 1922, at Boston, Mass. Secretary, R. S. Townsend, 27 Kilby St., Boston, Mass.

Southern Appalachian Coal Operators' Association will hold its next meeting Jan. 27, 1922, at Knoxville, Tenn. Secretary, J. E. McCoy, Knoxville, Tenn.

Pittsburgh Vein Operators' Association of Ohio will hold its annual meeting on Feb. 13, 1922, at Cleveland, Ohio; D. F. Hurd, secretary.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER AND R. DAWSON HALL, Editors.

Volume 21 NEW YORK, THURSDAY, JANUARY 12, 1922 Number 2

And Yet!

THIS shall be a bare recital of facts, an unqualified record of a conflict of minds. The Central Competitive Field operator—one who mines, that is, in western Pennsylvania, Ohio, Indiana or Illinois or more than one of those districts—does not like the union, meaning the United Mine Workers of America. That organization does not keep its bargains; it does not assure peaceful operation; it is not reasonable; it does not give the operator who does business with it his due; it opposes the introduction of new and better machinery. As you listen to the operating man you wonder that he ever signed up with such a treacherous, unfair and unfaithful antagonist. And yet!

The union has one advantage. Its far-reaching biennial agreements, broken though they often are, have done something for permanence in operation. Just now southern Ohio, eastern Ohio and the Pittsburgh district have refused to make a contract, or, rather, to meet for the purpose of making one. Illinois and Indiana have consented. It is a known fact that Illinois has agreed to discuss terms, and the public has been told by President Lewis that Indiana also has given assent. What will happen if the Hocking region, the Pittsburgh vein operators of Ohio and the Pittsburghers refuse to make one? Just this, Illinois and Indiana will fear to sign a contract or will consent to sign for a short time only or without any time limitation, for may not the union if uncommitted make a better bargain with Ohio and Pennsylvania later or may not these districts make contracts with local bodies or the union go to the wall and understandings be made between individual operators and their men, and will not those agreements be for an unspecified time, liable to be revised at any moment if wages in the present non-union areas take another drop?

Unless the whole Central Competitive Region makes a scale and the rest of the unionized areas follow it, there will be no assurance that some important regions will not obtain lower wage scales and the area signing be obliged to close down. It seems clear that the whole Central Competitive Region or a still larger region must sign or it will not be safe for any section to make any kind of contract. If the larger area signs up the union will have funds to make the others sign and there will then be some assurance of stability—not for a time only but for two years. With stability assured, long-time contracts may be made, but with the possibility of undercutting nothing can be predicted. The industry becomes uncertain. Every mine is watching the scales of its neighbors and has no assurance of a consistent wage scale. Every operator keeps his pen poised ready to write, and tacks handy to post, a new scale for the morning of the day following. There can be no certainty in non-unionism; before the union came all was chaos. Nor will there be storage of coal by the consumer. He will buy what he wants when he wants it, hoping coal will be cheaper later on.

In Indiana and Illinois more than in most regions the miners have a good nucleus of men who have worked with one another for years. They largely own their own homes. They have opportunities to work on the broad acres around them. They have farmed the land for years. Consequently they are able to put up a vigorous resistance. If the operators in these states were to make a scale alone, it would be a high scale. Other regions where there were men of less homogeneity, less faith in one another, possessed less generally of a common tongue, not intermarried, tenants and not owners, with fewer farm lands to cultivate could drive a better bargain. Other sections where there are negroes and undigested aliens, few homes and no farms would drive one that was still lower, and Indiana and Illinois would have to nail up their buildings and wait and wait.

Consequently, Indiana and Illinois want the contract if it can be made broad enough. It is their defence against a competition in which they are the weaker parties. In fact all the Central Competitive Region feels in a degree that it would like a contract for the stability of wages and prices it affords, yet it would not be unfortunate for the eastern half of the region and for the areas around if Illinois and Indiana were bound hand and foot for two years and the rest of the coal fields were free.

But Illinois recalls a celebrated saying of one of its leading citizens that a nation cannot be "half bond and half free," and knows that the Middle West cannot endure to be alone under the bond. If it can only put the rest under the same yoke, well and good—that will be helpful—but if not, Illinois, Indiana and Iowa must be free and if the Eastern operators will not bind themselves there can scarcely be an agreement of any kind anywhere. The union must then be broken. There is almost no other way; none certainly that looks hopeful.

But everyone wants a more stable industry and, moreover, no one would like to see a competition that would bring wages to a level below the cost of living, below even the cost of subsisting, to sweat-shop levels. So despite all the anti-union talk, the destruction of the union seems fraught with mischiefs.

It might be possible, if indeed it is within the law, for the operators in the various regions to get together and formulate a scale and agree to keep it, but that would not bind new arrivals in the industry. Moreover, it is doubtful today that if the wage were cut even 50 per cent the non-union mines would be prevented from making even more drastic cuts and from continuing to take all the business available, for the non-union areas are growing while the union areas are standing still. Union workers are migrating to non-union fields. Non-union mines are buying up-to-date machinery and so fortifying themselves to keep the business gained and preparing themselves to get more men and to produce a yet larger percentage of all the coal mined. No longer is the consumer obliged to buy coal from the well-unionized fields.

The non-unionized areas can in times of halting industry supply the market, and in fact so little is the demand and so great the supply of non-union fuel that between the non-union mines there is already the bitterest of competition. With the New River field and the Potomac fields already breaking from the union and with the promise of further union losses as soon as the operators in other fields are released of their obligations it seems that non-unionism is the safer bet. If there are not enough union mines to stabilize the industry a contract is unthinkable.

When all coal was regarded as equally valuable and it was not known that the non-union fuel was in a general way, yet with important exceptions, the best in heat-producing quality and in freedom from clinker, business could be done despite the undercutting of the non-union fields, which were then not so greatly developed. Yet in those early days at every lull in business the union almost entirely collapsed What shall be said of today, when the non-union fields produce so much and are known to produce such excellent coal? In idle times they seem to preclude the possibility of unionism. If the New River field with its excellent coal becomes non-union, as seems to be likely, one questions whether the large factor in the bituminous field may not be the non-union regions rather than the Central Competitive.

"Shout with the crowd," said Mr. Pickwick. "But if there are two crowds?" asked Mr. Snodgrass. "Then shout with the largest." Apparently the operators on the banks of the Allegheny and the Ohio are taking Mr. Pickwick's time-honored advice and have decided that the non-union areas constitute the larger crowd, if not in numbers or productive capacity at least as holding the key to the situation. And that being the case, they cannot make a contract with the union.

Is This a Square Deal?

A BARE 8-per cent salary increase in 74 years? One envisions a job whose importance has declined 100 per cent or so. Illogical as it may seem, the primary examiner in the United States Patent Office—scores of him—holds that unfortunate job. In 1848 his salary and that of the United States District Judge were fixed at $2,500. Today the judge gets from $7,500 to $10,000. The examiner, whose service to his country has broadened and deepened, gets $2,700.

His work is essential, if not vital. He passes upon an average of 1,500 applications every year, deciding whether they are valid, whether the alleged invention is novel as compared with the prior art, and whether that novelty rises to the dignity of an invention as distinguished from the mere skill of the calling. He is scientifically trained and an authority on patent law. And he has done his work so well, traditionally, that United States courts, in cases of patent infringement, customarily accept his findings as conclusive evidence. After years of experience in a given class of inventions the examiner becomes the most skilled man in that art in the United States. This is exactly as it should be. But $2,700 a year——!

"The general reclassification bill will provide for patent examiners," Floor Leader Mondell answered largely when the American Engineering Council urged him to bring the Lampert Patent Office Bill, H. R. 7077, before the House of Representatives for an immediate vote. "But," the engineers protested, "it will be at least eighteen months before the reclassification bill can take effect, and even then it will not go far enough in the Patent Office."

And those engineers are right. The United States Patent Office, from which Americans have a right to expect a near approach to infallibility, already suffers twenty gaps in its examining force. This considerably reduces the office's efficiency. What is worse, those young men who do become examiners—at $2,700—leave the government service for more lucrative work so early that the government—and the people—cannot benefit by the training given them.

All Americans have an interest in the Lampert bill to pay primary examiners $3,900—from increased patent fees—but it is of especial moment to the technical professions that this bill be passed at once.

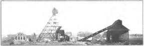
Passing of Fuel-Oil Menace

IN TIMES of low demand for coal the "fuel-oil menace" rises to plague the coal producer. In 1919 there was much investigating of and protesting at the influx of fuel oil from Mexico. The mine workers' union petitioned for an import duty to protect their members against the peon labor of Mexico. Along came the strike and the boom prices for coal in 1920, and oil was forgotten, save in isolated localities.

If it is economic waste to burn raw coal under boilers, as many proclaim, then it is economic crime to use petroleum products for steam raising. But the oil is here, it is a favored fuel and it has been priced to compete successfully with coal. The majority of the ships on the high seas are fuel-oil burners, the railroads west of the Rockies depend on oil, industries in New England, along the Atlantic seaboard and on the Gulf coast are large users of fluid fuel as against coal.

Mexico and its fabled gusher oil wells has been the chief source of imported fuel oil. In this issue we publish an article from the pen of one who is well and authoritatively informed on the Mexican oil situation. He reviews a situation that has been recognized for nearly a year in engineering circles, namely, that the heyday of Mexican fuel oil is over. Production, so called, from that region is really shipments from storage. The end of abundant fuel oil is at hand. It is perhaps significant, as pointed out by J. E. Pogue, in the *New York Evening Post*, that following the visit of certain oil magnates to Mexico last year, to investigate —the taxation problem—the price of domestic crude advanced in two months by 66 per cent, and oil shares on the stock market anticipated the rise in prices.

Imports of oil, mainly, of course, coming from Mexico, averaged around 10,000,000 barrels per month in 1921 —roughly equivalent to 2,500,000 tons of steam coal. The coal industry will welcome an increase in the market by this extent, even though it may come from the misfortune of the Mexican oil producers.



HOIST HOUSE, HEADFRAME OF MAIN HOISTING SHAFT, TIPPLE, CRUSHER HOUSE, CONVEYOR SHED AND LOADING BINS*

Standard Oil Co. of Indiana Develops Big Stoker-Fuel Mine in Macoupin County, Illinois

Designed for an 8,000-Ton Daily Output, Coal Weighed Underground, Hoisted in Skips, Crushed and Delivered to a Loading Bin Spanning Eighteen Railroad Cars, Nine of Which May Be Loaded Simultaneously

AT SCHOPER, ILL., about 9 miles northeast of Carlinville, the county seat of Macoupin County, a large coal-mining plant was recently completed for the Standard Oil Co. of Indiana. This firm controls some 25,000 acres of coal rights and owns about 1,800 acres of surface. The depth of the coal at this point is approximately 315 ft. and the thickness of the bed is 6 to 7 ft.

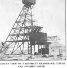
The plant is electrically driven throughout, no other form of power being used. Steam is generated but it is utilized for heating only. The mine is planned and equipped for a daily capacity of 8,000 tons, and the entire output will be used at the company's refineries in Woodriver, Ill., and Whiting, Ind.

Two shafts have been sunk, more than 12,000 ft. of entry have been driven and the surface plant erected. The shafts lie east and west from each other and 775 ft. apart. The main shaft has an excavated area of 11 ft. 6 in. x 21 ft. 6 in. Lined with reinforced concrete, this gives a clear cross-section of 7 ft. x 17 ft. This shaft contains two hoisting compartments in each of which a 12-ton self-dumping Kimberley skip rises and falls between 60-lb. rail guides. The material shaft has an excavated area of 18 ft. 6 in. x 35 ft. 6 in. With a reinforced-concrete lining this affords a finished shaft area of 14 x 31 ft.

This shaft contains separate compartments accommodating respectively the ventilating current, a stairway, a double-deck man cage and a single-deck material cage. Both cages are used for hoisting men, but the double-deck cage is utilized also as a counterweight to the material cage. Special counterweight cars are kept on the bottom to be placed on this cage when heavy equipment is being moved in the shaft.

In lining the shafts a collapsible, or knock-down, wooden form of original design was used, so contrived that the heaviest unit easily could be handled by one man. It was set and stripped in units, and consisted of lagging made of 2 x 10-in. yellow pine, corner posts of 6 x 6-in. timber and lockbars of 3 x 8-in. material. A 6-ft. length of lining was poured at each set-up.

Concrete was mixed in a 21-cu.ft. drum mixer and



CLOSE-UP VIEW OF MAIN-SHAFT HEADFRAME, TIPPLE AND CRUSHER HOUSE

Coal may be dropped into railroad cars as run-of-mine, a track under the tipple being provided for that purpose, or it may be dumped on two 14-in. feeder conveyors and delivered to bar screens, the oversize going to two crushers. The coal thus crushed to 1½-in. size is discharged onto a 60-in. apron conveyor which takes it to the loading bins, where two 72-in. flat-top conveyors with the aid of plows discharge it at various points in the bin.

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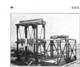
*Note how far it is from the tipple to the storage bins. Even end on the unusual size of the loading bins is not readily apparent. The bins are 350 ft. long and 48 ft. wide, and eighteen railroad cars can be placed beneath them.



TWO-DECK MAN CAGE AND MATERIAL HOIST

The one is a counterweight to the other. Though the one is termed, specifically, a material hoist, it is used like the other for the hoisting and lowering of men.

shot down the shaft through a 4-in. pipe, to the bottom of which a flexible, jointed grain chute was attached by means of which the concrete was distributed directly to the lining. A sufficient number of forms were made to allow one to remain in place until the concrete had thoroughly set. The cycle of operations followed required that one form be poured every day. It was found, however, that one and one-half to two forms could sometimes be poured in twenty-four hours.

The main-shaft hoisting unit is an Allis-Chalmers electric machine of the double-drum geared type. The drums are cylindro-conical with a maximum diameter of 11 ft. 6 in. and a 4-ft. face between flanges. This hoist is driven through single-reduction herringbone gears. The pitch diameter of the main gear is 13.2 ft. and that of the motor pinion is 12.66 in. The hoist is designed to handle two skips in balance with a maximum unbalanced load of 27,000 lb. It is capable of making seventy-two trips per hour. The hoisting rope is 2 in. in diameter, and the speed is approximately 900 ft. per minute.

The weight of the skip is 19,000 lb., that of the coal 24,000 lb. and of the rope 3,000 lb., making a maximum stress of 46,000 lb. on the hoisting cable. Deducting the weight of the descending skip, or 19,000 lb., leaves a maximum unbalanced load, as stated above, of 27,000 lb.

The hoist is equipped with a post brake of the parallel-motion type which is operated by an auxiliary air engine, the crosshead of which is connected to the lever arms carrying the brake weight. The brake engine is of the vertical type, having a 6-in. oil cataract cylinder arranged in tandem with a 6-in. air cylinder. It is provided with an auxiliary valve operated by a solenoid connected with the overwinding device.

When the current is on this auxiliary valve is held closed by means of the solenoid, which is so connected that, if the current fails because of an interruption of electrical service or to its being cut off by the switch on the overwinding device, a weighted lever will be released. This operates the auxiliary valve and releases the air pressure on the lower side of the brake engine piston, shutting off the air supply to the engine. This allows the brake to set by gravity, thus bringing the hoist to a stop.

The hoist is further protected both by an electrical interlocking device between the brake lever and the controller lever and by a retardation mechanism. This machine is driven by a 900-hp. 2,200-volt 60-cycle 3-phase Allis-Chalmers motor having a synchronous speed of 360 r.p.m. and a full load speed of 353 r.p.m. The motor is controlled by a liquid rheostat of the regulating-weir type which is provided with the necessary circulating

Material Shaft Headframe

With tipple, hoist house and fan house. The material shaft has four compartments, one for air, one for a stairway, a third for a double-deck man cage and a fourth for a single-deck material cage. Special counterweight cars are kept on the bottom to be placed on the man cage when heavy equipment is to be lowered or raised in the material cage. The hoist engine has an 8-ft. drum and a 1½-in. rope, the main shaft having an 11-ft. 6-in. drum with a 2-in. rope.

VENTILATING FAN BEFORE ITS HOUSING WAS ERECTED

The fan measures 7 ft. x 3 ft. 6 in. and is a double inlet multivane fan having reversing damper, reversing inlets and explosion and air-lock doors. It will make 100,000 cu.ft. of air per minute at a speed of 150 r.p.m. against a static pressure of 2½ in. of water. Raising the speed to 200 r.p.m. it will deliver 132,300 cu.ft. of air against a static pressure of 4 in. of water.

pump, cooling coils and master switch. A motor-driven reversing switch is used.

The material shaft hoisting unit is an Allis-Chalmers unbalanced single-drum electric machine. The drum is 8 ft. in diameter with a face 4 ft. long between flanges. This hoist is driven through single-reduction herringbone gears. The pitch diameter of the main gear is 7.6 ft. and that of the motor pinion is 11 in. The rope speed is approximately 600 ft. per minute, and the motor operates at 390 r.p.m. The hoisting rope in this shaft is 1½ in. in diameter.

This hoist is driven by a 250-hp. 2,200-volt 60-cycle 3-phase Allis-Chalmers motor having a synchronous speed of 400 and a full-load speed of 390 r.p.m. The control and braking device is similar to that of the main hoist except that the reversing switch is operated by solenoids. Each hoisting unit is equipped with a 20-cu.ft. motor-driven compressor for supplying the air necessary to operate the brake engines.

The ventilating fan is an 84 x 42-in. double-inlet Sirocco wheel fitted with the necessary housing, reversing damper, reversing inlets and explosion and air-lock doors. The fan has a normal capacity of 100,000 cu.ft. of air per minute against a static pressure of 2½ in. of water at a speed of approximately 150 r.p.m. At a speed of 200 r.p.m. this machine will deliver 132,300 cu.ft. of air per minute against a static pressure of 4 in. of water.

TIPPLE USED IN SINKING SHAFT

The spoil was discharged into railroad cars and hauled away from the plant by locomotives. It will be noted in other illustrations that the ground is not filled in by the waste from shaft construction.

MATERIAL HEADFRAME UNDER ERECTION

The back stays had not been erected when the photograph from which this illustration was made was taken. To the rear will be seen the hoist house and in the foreground the fan and its foundation.

At present this fan is driven by a 35-hp. motor, which will be used during the early development of the mine, but after the operation has grown beyond the capacity of the fan with the present motor the drive will be changed to two 150-hp. 3-speed motors having synchronous speeds of 300, 450 and 600 r.p.m. One of these motors will be held as a spare.

Coal-loading arrangements on the main bottom consist of two motor-operated rotary dumps discharging into the storage hoppers, whence the coal will go into a measuring hopper before being automatically loaded into the skips. The descending skip deflects the discharge chute into such a position that the coal discharges into the skip only after this device has reached its lowest point. The descending skip also trips a trigger which controls an air-operated cut-off gate. All this equipment was furnished by the Link-Belt Co.

Pit cars enter the dumps from a motor-driven car haul. They are weighed while in motion on a 15-ton railroad scale provided with a Streeter-Amet recording device. These cars are of 6-tons capacity each and are equipped with roller-bearing wheels.

Two 300-kw. synchronous motor-generator sets with direct-driven exciters have been installed in a room on the bottom near the material shaft. The motors operate on 2,300-volt 60-cycle 3-phase alternating current and the direct-current generators have a continuous capacity of not less than 1,080 amp., a voltage of 275 for day

ROTARY DUMPS TILTED OVER ON THEIR SIDES

These motor-operated dumps are now in place near the foot of the shaft. They discharge the coal cars into storage hoppers from which the coal passes to a measuring hopper before being dumped automatically into the skips.

operation and a storage battery-charging potential of 135 to 185 volts.

The equipment for mine haulage at this plant consists of General Electric 15-ton trolley locomotives for main-line haulage and 6-ton combination battery and trolley machines for gathering. The mining machines employed are Sullivan ironclads of the shortwall type. The mine track is of 48-in. gage laid with 60-lb. steel on the main bottom and 40-lb. on the haulage entries.

Power is furnished from the Standard Oil Co.'s power house a half mile west of the mine. It is transmitted to this operation at a voltage of 6,600 through a 3-conductor 500,000-c.m. lead-covered cable laid underground. Main and material hoists each have a bank of oil-insulated air-cooled 6,600 to 2,300-volt transformers. The lead to the mine is a 3-conductor 500,000-c.m. lead-covered armored cable suspended in the air compartment of the material shaft connecting a panel on the material-hoist switchboard to the motor-generator room on the bottom. The trolley feeders are single-conductor 750,000-c.m. wire-armored cables. The trolley wire is No. 0000 grooved.

GEARS ON THE MAIN HOISTING ENGINE

Single reduction herringbone gears are used. The main gear is 21.2 ft. in diameter, and the motor pinion which drives it 2.66 ft. The reduction is, therefore, roughly 1 to 8. Note the cylindro-conical drum on the left.

An elaborate system for handling the coal after it leaves the main hoist tipple has been devised. The self-dumping skips deliver their contents into receiving bins, whence the coal can be discharged directly into railroad cars if run-of-mine is to be shipped or onto two 54-in. feeder conveyors delivering to bar screens from which the oversize is dropped to two American Pulverizer Co.'s crushers each having a capacity of 500 tons per hour. These reduce the coal to 1½ in. in size and discharge it upon a 60-in. apron conveyor, which in turn delivers it to the loading-bin conveyors. Screenings drop directly upon the apron conveyors, each of which is driven by a 75-hp. motor. They are each 137 ft. 6 in. long from center to center of head and tail shafts.

The loading bin is 360 ft. long and 40 ft. wide. It is built of structural steel and plate and stands upon concrete foundations. It is served by two 72-in. flat-top conveyors that receive the coal from the apron conveyors and discharge it at various points over the bin by means of plows. Each conveyor is driven by a 25-hp. motor. The bin is so arranged as to cover two nine-car trains. Every car of a train can be loaded simultaneously and each train alternately.

SUBMERSIBLE SKIPS AWAITING ERECTION

These skips have a capacity of 12 tons and run between 85-lb. rail guides. Each skip weighs 9½ tons. The maximum stress on the hoisting cable is 23 tons.

All buildings other than the tipple and bin are constructed of brick on reinforced-concrete foundations. All have steel roof trusses and 2-in. matched-lumber roof sheeting. The main- and material-hoist buildings are roofed with slate, the office and change house with 3-ply bituminous roofing, and the heating plant, fan house and powder magazine with waterproofed reinforced-concrete roof slabs. Steel sash is used throughout. The change house contains lockers and overhead hangers for 300 men. It also is provided with twenty-four shower heads and the usual sanitary equipment.

All the buildings are heated from a central heating plant with the exception of the main-hoist house, which is fitted with a hot-air furnace. This was necessary because of its remoteness from the heating station. The heating plant furnishes hot water for the change house and office building and contains steel bins and a sand dryer as well as a fireproof room for oil storage.

The railroad yard contains approximately four miles of trackage laid with 85-lb. rails. It also contains twenty-six turnouts. A 14-ft. roadbed is maintained with 12 in. of cinder ballast under the ties.

This coal-mining plant was conceived by E. M. Clark in 1916, then superintendent of the Woodriver refinery but now director and general superintendent of the Standard Oil Co. of New Jersey. Development of the property was started under his administration in December of 1917. Mr. Clark was succeeded in September, 1918, by C. B. Manbeck, under whose administration the project was completed and is now being operated. Curtis W. Clark is resident manager in charge of operations. Robert W. Hunt & Co. was the consulting engineer. The mining plant was built, the shafts sunk and the mine opened by B. G. Slining, of Chicago.

Determining Meridian by Observations of Polaris at Any Time of the Night

Observation of Polaris at Elongation Requires No Calculation—Observation at Culmination Liable to Error—Observation at Any Time Necessitates Calculations, Which Are Fully Explained and Illustrated

By A. C. Callen*

DETERMINATION of meridian by observation of Polaris at elongation is a favorite method with many surveyors on account of its simplicity and freedom from calculations. Its main disadvantage is that it frequently involves work in the small hours of the morning, and even if the engineer does not mind being called out at about 3 a.m. on a frosty morning he may find the star hidden by a cloud just when he is ready to make the observation.

An observation at culmination is possible but any error in the chronometer or in the calculation of the time of culmination is serious, for at culmination the azimuth of Polaris is changing at a rate greater than 20" per minute.

To calculate the azimuth of Polaris at any particular time of observation is possible but the average engineer or surveyor is very likely to be unfamiliar with the calculations and may easily make a mistake, particularly in changing mean time to siderial time.

The method described by D. J. Brown in *Coal Age*, vol. 1, p. 245, gives a graphical solution for observations taken at any time, and if the observations are carefully made and a suitable scale selected for plotting, the results should be correct within one minute or less.

Polaris Makes Small Circle About the Pole

A brief description of the underlying theory will show the simplicity and accuracy of the method. Polaris apparently moves in a small circle about the pole. Its distance from the pole measured on a great circle is called the polar distance and is equal to 90°—declination of Polaris. The polar distance at the present time is about 1° 6′ 40″.

If Polaris could be followed through the telescope of an engineer's transit for twenty-four hours and the plate and vertical circle readings recorded at frequent intervals and then plotted on cross-section paper, the apparent path of Polaris would be an ellipse because the abscissas (plate readings) would represent azimuths of the star, and the maximum abscissa, the azimuth of Polaris at elongation, would be greater than the maximum ordinate which would be a function of the polar distance. One-half the major axis of the ellipse represents the azimuth at elongation, and one-half the minor axis represents the polar distance. The intersection of the axes is, of course, the position of the pole.

If observations are to be made for only a few hours we would have only a portion of the ellipse and it would be almost impossible to accurately locate the position of the pole. If the result of the plotting were a circle its center could be accurately located if we had two or more points on its circumference and knew its radius. With three or more points the radius need not be known.

In this problem, however, the radius is always known and assists somewhat in securing accuracy. Fortunately, this circle can readily be plotted by means of the theorem regarding the "auxiliary circle" to an ellipse, which may be stated thus: An ellipse may be transformed into a circle having for its diameter the major axis of the ellipse by multiplying all ordinates by the ratio of the major axis to the minor axis.

Method of Observation

Have the transit in perfect adjustment. Set up over a permanent station, set the plates at zero and sight on a reference point about 300 or 400 ft. distant. This sight is preferably taken without plunging the telescope. Clamp the lower motion and loosening the upper motion sight the instrument on Polaris. Read and record the altitude of the star and the amount and direction of the angle turned off.

Immediately loosen upper motion, plunge and swing-

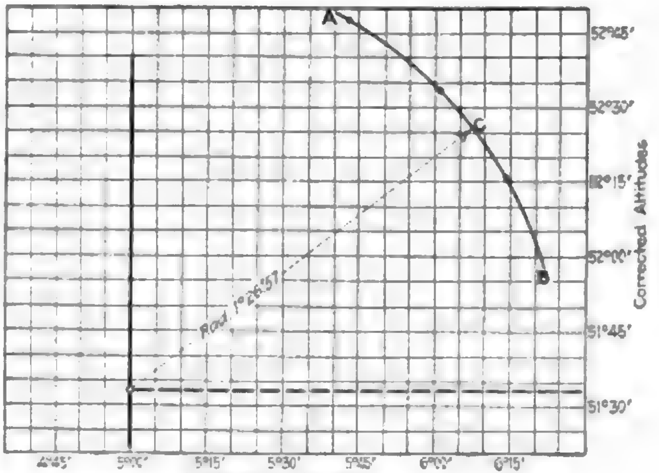


FIG. 1. PLOT OF MORGANTOWN OBSERVATIONS

Had an angle of 5 deg. been turned from the reference line to the right the telescope of the transit would have been in the plane of the meridian. Hence the reference line was No. 5W.

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*Professor of Mining Engineering, West Virginia University, Morgantown, W. Va.

ing the instrument through azimuth, take another set of readings to compensate for any possible errors of adjustment. The average of these readings, first correcting the second plate reading by 180°, will give the average altitude and angle between the reference line and Polaris for that set.

In about an hour take a second set of readings and in another hour, a third set. The time interval is of no importance except to give a considerable distance between the points on the circle. Two sets of readings are sufficient, but additional sets serve as a check.

In order to correct the altitude readings so as to throw the plotted positions of Polaris on a circle rather than on an ellipse it is necessary to multiply the altitudes by the ratio of the azimuth at elongation to the polar distance. A solar ephemeris for the current year such as is published for free distribution by the manufacturers of surveying instruments, will give the declination of Polaris for any time of the year.

Or, the "Ephemeris of the Sun and Polaris," which is published annually by the Department of the Interior, can be obtained from the Superintendent of Documents, Washington, D. C., for 5 cents. The polar distance is 90 deg. — declination. If an Ephemeris is not at hand the declination of Polaris may be closely approximated, the average declination for 1921 being 88° 53.11′ and increasing annually at the rate of 0.27′.

CALCULATION DEPENDS ON OBSERVER'S LATITUDE

The latitude should be known rather closely, within 5 or 10 min., if possible, as it is necessary to calculate the azimuth of Polaris at elongation by means of the formula:

$$\text{Sin azimuth} = \frac{\text{sin polar distance}}{\text{cos latitude}}$$

An assumed set of notes for Nov. 10, 1921, with the calculations indicated, will show the ease with which the meridian may be obtained.

Observations taken at Morgantown, W. Va. (lat. 39° 38′ N.), Nov. 10, 1921:

Declination of Polaris (from Ephemeris)	88° 53.33′
Polar distance (90 deg. − declination)	1° 06.67′
Azimuth at elongation $\left(\text{sin Az} = \frac{\text{sin polar dist.}}{\text{cos latitude}}\right)$ ..	1° 26.57′
Ratio of azimuth to polar distance... ....(1° 26.57′ : ° 06.67′)	1.30

Time	Hor. Angle Turned to Right to Polaris	Altitude Polaris	Average Hor. Angle	Average Altitude	Corrected Alt. (Alt. × 1.30)
7.16 p.m.	6° 15′	40° 11′	6° 14.5′	40° 12′	52° 15.5′
7.21	186° 14′	40° 13′			
8.15	6° 02′	40° 24.5′	6° 01′	40° 25.5	52° 33′
8.19	186° 00′	40° 26.5′			
9.18	5° 44′	40° 36′	5° 43′	40° 36.5′	52° 47.5′
9.22	185° 42′	40° 37′			

The average horizontal angles are plotted as abscissas and the corrected altitudes as ordinates on cross-section paper, the scale being chosen so that 1 deg. is represented by at least 3 or 4 in., as shown in Fig. 1. The center *O* of the arc *A B* of a circle having a radius *O C*, equal to the azimuth at elongation, the said arc passing through the plotted points, represents the position of the pole.

In Fig. 1, the center *O* being at 5° 00′ indicates that, had an angle of only 5° 00′ been turned from the reference line to the right, the telescope of the transit would have been in the plane of the meridian; hence the bearing of the reference line is N 5° 00′ W in this instance.

The position of the pole corresponds to an altitude reading of 51° 33′. Dividing this by 1.30 gives 39° 39′ for the altitude of the pole as observed through the instrument.

TABLE

Mean Refraction Corrections to Be Applied to Observed Altitudes

Altitude	Refraction
20°	2′ 30″
22°	2′ 23″
24°	2′ 10″
26°	1′ 59″
28°	1′ 49″
30°	1′ 41″
35°	1′ 23″
40°	1′ 09″
45°	0′ 58″
50°	0′ 49″
55°	0′ 40″
60°	0′ 34″

Applying the refraction correction for this altitude, about 1′, we get 39° 38′ as the true altitude of the pole. Inasmuch as the altitude of the pole is the latitude of the place of observation the latitude 39° 38′ is found to check with our known latitude.

If the exact latitude was not known when the azimuth at elongation was computed it can be found by this method, and should not be in error more than 1 or 2 min. if the assumed latitude was within 10 or 15 min. of the correct amount.

Stated briefly the rule is: To find the latitude of a place of observation, divide the corrected altitude reading of the pole, as obtained from the plot, by the ratio originally used to obtain the corrected altitude; subtract the refraction correction for proper altitude, as shown in the above table; the result will be the true latitude of the place of observation.

DR. A. R. POWELL, physical organic chemist of the U. S. Bureau of Mines, is continuing his work on sulphur in coal and coke. Large-scale oven tests, supplementing laboratory work to determine the action of hydrogen on the sulphur in coke and its possible commercial application to coke desulphurization, have been completed. These tests showed much lower desulphurization than the laboratory tests, but enough to justify further work in the laboratory. The results of the work on sulphur in coal and coke have been brought out in a series of papers by Dr. Powell.

TO AID in the conservation of fuels, research into their use in heating and ventilating plants is being conducted at the Pittsburgh Experiment Station of the U. S. Bureau of Mines under a co-operative agreement with the American Society of Heating and Ventilating Engineers. Work on the following problems is now in progress under this agreement: Standardization of the measurement of dust particles suspended in air; study of combustion in domestic heating boilers; checking results obtained in the application of the testing code covering house-heating boilers; the effects on health of temperature, humidity, and motion of air in buildings and plants.

J. D. DAVIS, chemist, U. S. Bureau of Mines, has investigated methods of sampling and analysis of foreign governments as applied to American export coals. Mr Davis and Palmer B. Place, junior chemist, are determining the reaction heat of coal during destructive distillation. Representative American coals of all ranks are being studied; the total heat of reaction and the temperatures at which heat effects are manifest are being determined. Mr. Davis, in co-operation with the carbonization committee of the American Gas Association, is investigating low-temperature carbonization methods, particularly as applied to problems of the gas industry.

CO-OPERATIVE SAMPLING OF COAL MINES has been done in the State of Virginia, the samples being taken by the State geologist under the U. S. Bureau of Mines' regulations and analyzed by the bureau's chemists.

Steel for Strength, Asphalt for Dryness, Asbestos for Life Make Light and Lasting Coat for Roof or Walls

Annealed Steel Freed of Impurities Protected Against Gases and Moisture by Asphalt, Any Defects of Which, When Traveled On, Being Corrected by a Coat of Asbestos and Waterproofing

MANAGERS and superintendents are harassed by continued calls on their time to supervise repairs and meet emergencies, so that too often they do not have any opportunity to give their attention to the weightier matters of production and lowered cost. If the preliminary work be rightly performed the plant cares for itself and the only variables which need supervision are those of the underground, of preparation and of personnel management. It is remarkable how many men in undertaking construction overlook the harvest of misfortune, labor, anxiety and uncertainty they lay up for themselves by deliberately choosing perishable material.

ALWAYS MANY REASONS FOR USING MAKESHIFTS

There are two periods in operation which cover almost all the years of experience: Times when material and labor are hard to obtain and production is so pressing that repairs are delayed and overlooked, and times when there is no chance to operate at a profit and when, though materials and labor are plentiful, expenditures for upkeep are forbidden or must be kept down to a minimum. It is always either shining or raining and, as the well-known story goes, it is in either event a poor time to mend the roof. If the roof is built right or the superintendent boldly decides that, rain or shine financially, it must be renewed permanently, a grist of troubles which may later overtax the management may be avoided.

Certain stable, permanent, fixed supplies and equipment about a mine undergo but little change during long periods of years. Unfortunately many coal companies believe that they cannot afford to make an initial investment in these materials such as would enable them to buy a product the cost of which over years is much less than that of a cheaper substitute. In the long run the investment in the cheaper product is the greater. Many companies, however, do not hesitate in this regard. Where permanence is desired they buy a permanent product, even though the initial cost be large as compared with one possessing less lasting qualities.

PROTECTIVE COATING IS ITSELF PROTECTED

The H. H. Robertson Co., of Pittsburgh, Pa., manufactures a protected material known by its trade name as the Robertson process metal, which in its various forms is used widely for industrial-building construction. It finds application in place of sheet-metal coverings, particularly those that are galvanized. The first cost of this product is high—several times that of the ordinary unprotected material—but its life is much longer. Its installation cost is no greater than that of the all-metal product and its maintenance expense is almost negligible. A building when once completed and covered with this product is permanently attractive, substantial and requires no outlay for upkeep.

The metal base of this product is an annealed steel sheet the surfaces of which have been freed from impurities, thus insuring a perfect bond with the covering material. The metal is protected from gas and moisture by a coating of asphalt, which in turn is protected from abrasion and held in place by an asbestos-felt blanket. This covering is guarded from destructive agents by a tough and elastic waterproof coating that will not crack or chip. The asbestos is drawn over the edges, which also receive the protection of both the asphalt and the waterproofing compound.

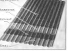
This building material is made in a number of standard forms and sizes suitable for almost any kind of construction. With a wide assortment to choose from, a structure may be erected economically and at the same time embody permanence. In addition to roofing and siding sheets, accessories in the form of ridge caps, flashings, louvres, ventilators and skylights are furnished.

MOLDED INTO MANY SUITABLE BUILDING SHAPES

Roofing and siding sheets are made in several forms. Among these are the corrugated, the beaded and the standard sheet for roofing and siding, while a clapboard sheet is furnished for siding only. A flat sheet finds application as sheathing. The joints in this case may be covered with wood battens, giving a panel effect. Such sheets may be used for any purpose where a flat surface is required, as, for instance, in partition walls, fire doors and the like.

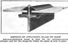
For roof run-off, gutters and downspouts of this same material serve for a long time where other more expensive material would fail. Assembly of the various types and sizes of sheets is accomplished by means of suitable fastenings, made specially for the purpose.

The corrosive action of acid-bearing gases on metal



ASBESTOS-PROTECTED METAL

On a base of annealed sheet steel is placed a coating of asphalt which protects the metal against corrosion. But the asphalt would be scratched or scraped off in use, so a coat of asbestos is put on it which has the necessary enduring qualities. This in turn is covered by an elastic waterproof coating.



METHOD OF ATTACHING GLASS TO ROOF

Asbestos-protected metal is used for the moisture-catching troughs and for the clamp by which the glass is held in place.

roofing, such as that covering a boiler plant, compels periodic and costly replacements. Robertson process metal with its impervious covering will withstand this corrosive action indefinitely. In addition to being less expensive than clay roofing products, it has the advantage of weighing less and thus a lighter roof structure will support it. Where a fireproof material is needed this metal may be used to advantage.

PAYS TO AVOID THE ANNUAL REPAIR BILL

Coal operations with a reserve large enough to guarantee production over a period of several years should be provided with structures upon which constant repairs and replacements are unnecessary. Such difficulties cause needless worry, mean additional off-shift work and sometimes halt operations. This material is well adapted to the covering of tipples and breakers. Many of the large coal companies have used it for this purpose throughout long periods, and continue its use in their new structures. Conveyor shelters covered with this metal give long service. Coal dust when accompanied by moisture has a corrosive action on galvanized iron which if not adequately combated or counteracted necessitates frequent replacements.

Buildings adjacent to beehive coke ovens must be able to withstand the action of the gases given off in the coking process or their life will be short. Protected metal has been tested by chemical manufacturers in places where extremely destructive gases are encountered and has proved itself highly resistant thereto.

Coal storage buildings, whose great expense of walls and roofs make their maintenance excessive if repairs are periodically needed, may be covered with this material, after which all appreciable upkeep cost ceases for a long time. Beaded sheets are giving excellent satisfaction for shaft houses. In blacksmith shops the flat sheets may well be used in the construction of flues. In fact each individual plant frequently discovers uses for this material adapted to its own specific requirements.

One of the primary requisites of a supply house or shop is that it shall possess lasting qualities. To obtain a fair degree of permanence the general practice in the past has been to resort to a heavy wall construction of brick, concrete or other massive material, whereas equal permanence may be obtained by using this metal over a light steel frame. The lighting problem is easily solved by employing special skylights in conjunction with any of the ordinary types of windows in the walls. After the foundation has been laid and the materials are on the ground such a building can be completed before the side walls of a corresponding brick structure could be erected. The cost of the lighter construction will be appreciably less than that of the heavier. Furthermore, when an alteration in a shop structure is desirable, as, for instance, the placing of a window or a door at some particular point, or the addition of an annex, a shop covered with protected metal may be easily changed to suit the requirements without destroying or wasting the material removed.

EACH OF THREE LAYERS HAS ITS PURPOSE

The three layers of protecting material placed over the annealed steel add much to the desirability of the finished product, each covering being used for a particular purpose. The claims made by the manufacturer for this building material include: (1) The impervious coatings protect the metal from rust, corrosion and general deterioration arising from exposure to the weather, smoke or gases; (2) the metal is not affected by severe acid or alkali fumes, condensation, galvanic action or by any metal-destroying agent to the attacks of which industrial buildings are liable; (3) the sheet, because of the nature of its protective coverings, possesses marked insulating qualities; (4) the outside coating, composed of mineral pigments, imparts a permanent color which possesses the economic advantage of rendering painting and other decorative work entirely unnecessary; (5) the sheets are light in weight, strong and easy to install; (6) they present an attractive appearance and reduce the construction costs of buildings of a permanent character.

Commodore Tipple

This plant, belonging to the Clearfield Bituminous Coal Corporation, of Clearfield, Pa., is covered on both sides and roof with asbestos-protected metal.

Correct Shape for Bits of Coal Cutters

By C. B. Officer*
Chicago, Ill.

ONE of the most important considerations in the successful and economical operation of chain coal-cutting machinery is the proper shaping of the cutter bits used in the machine, for they are the parts which come into contact with the coal. It naturally follows that anything that can be done to increase the actual cutting ability of these bits will increase production and reduce the cost of operation.

In discussing the shape of bit that should be used, the same terminology will be adopted in regard to the various sections of a cutter bit that Mr. Taylor adopted in his various reports on the results obtained by tools of various shapes in metal cutting. Many of the axioms which Mr. Taylor developed for metal-cutting tools are equally applicable to chain-machine cutter bits. Careful consideration given to the work required of machine tools in cutting metal and to the work imposed on chain-machine bits in cutting coal will soon convince anyone that there is a close analogy between them.

In the illustration are shown both pick-point and chisel-cutter bits. The various angles as indicated on the drawings are marked *A*, *B*, and *C*. Angle *A* is known as the clearance angle, angle *B* as the back-slope angle, and angle *C* as the side-slope angle. Each of these angles has an entirely different and separate function. Unless the cutter bits are made with the proper angle in each one of these three places, the proper cutting results cannot be obtained.

Twice the Angle Given Metal-Cutting Tool

The function of a proper clearance angle is to prevent the back, or heel, of the bit from rubbing against the coal face, for when this happens, more power is required to drag the bit and greater effort is required to hold the cutter bits up against the coal. Both of these factors mean an increase in the power required to make a cut. From experience in the field it has been found that the clearance angle of the chain-machine cutter bits must be about double that given a metal-cutting tool.

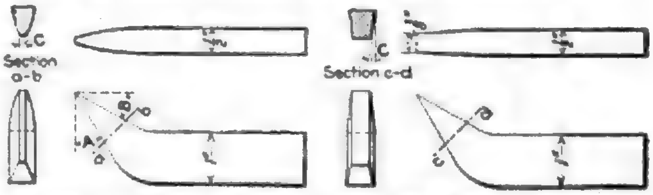
This larger angle is needed on a chain-machine bit because it is pulled along the face of the coal, the coal being cut as the metal in a planer, whereas with a lathe tool the metal that is being cut is rotated and its circular path gives more clearance between the back of the tool and the piece being cut.

Moreover, with a chain-machine bit, because of the nature of the work imposed upon it, it is necessary to continue running the bit after it has become slightly dull, whereas on a metal-cutting machine it is possible to replace the cutting tool as soon as it becomes slightly worn. If the chain-machine bit is used after it is slightly worn the bit will drag on the coal unless more clearance angle is given it than is provided the metal-cutting bit. From actual tests it has been found that both pick-point and chisel bits give best results when a clearance angle of about 30 deg. is provided.

Because of the structural difference between coal and metal, it is necessary to have the back-slope angle on the bit made greater than the same angle on metal-cutting tools if the chain-machine bit is to have a cutting action. If this angle is made flat, the cutter bits will not get in back of the coal, and produce a cutting action. A blunt-nosed tool crushes rather than tears, or cuts, the coal. Less power is required, of course, to cut than to crush the coal. If too sharp an angle be given to this back slope, it gives too weak a section across the nose or point of the tool, and the tool will not have sufficient strength to do the work. In order, then, to determine the proper back-slope angle, two factors have to be considered: the digging-in or cutting effect as balanced against the weakening effect on the bit arising from too great a back-slope angle. In balancing these two factors so as to produce the most satisfactory bit it has been found from many tests that an angle of approximately 30 deg. will give the most satisfactory service.

Side-Sloped so as to Avoid Wedging

The side-slope angle still remains for consideration. The correct adjustment of this angle is evident when it is considered that each bit in the cutter chain, every time it is pulled along the face of the work, makes a new cut in the coal varying in depth from ¼ to ½ in., depending upon the type of machine and kind of coal cut. Unless clearance be given along the side of the bit on its cutting portion, the sides of the bit will drag in the cut made and will produce a wedging rather than a cutting action. More power would have to be applied to the machine to drag the chain through the coal, and also more power applied to the mechanism for holding the cutter bar up against its work. This side clearance is one of the most important factors in the shaping of proper bits, and where hand or power forging is used, unless considerably more time than usual is taken to sharpen each bit, this side clearance cannot be obtained. Because of the importance of this side clearance and the great difference between the cutting ability and the power required between bits of proper and improper side clearance, greater attention should be given in the blacksmith shop in the resharpening process to give the proper side clearance to all bits. The proper angle is 7 deg. for chisel bits and 16 deg. for pick-point bits.



PICK AND CHISEL-POINT BITS FOR COAL CUTTERS

The clearance angle, *A*, should be so large that the bit will not drag along the coal, which does not retreat from the bit as does a piece of metal in a lathe. The back-slope angle, *B*, must be so large that the coal is cut and not crushed. The angles *A* and *B* must not be so large that the cross sections *ab* and *cd* are insufficient to meet the strain. The side-clearance angle, *C*, must be large enough to prevent wedging and small enough not to weaken the tool.

Tests made with machines having bits such as are generally found around coal mines and the same machines having bits which had been formed on the new Sullivan sharpening machine† showed that about 25 per cent more electric power was consumed when machines supplied with the former were used and the same number of places was cut. There also was a reduction of about 50 per cent in the force required to hold the machine or cutter bar up against its work. In the tests it was determined that a set of bits properly shaped with the Sullivan cutter-bit sharpener would cut a much greater number of square feet before having to be renewed than would a set of the bits such as is found at many mines.

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*Mining engineer.

†Described in Coal Age, Dec. 1, 1921.

Another Non-Gaseous Mine Explodes, Killing Two Men on the Surface

By George Edwards
Pikeville, Ky.

AT ABOUT 12.30 p.m. on Oct. 17, 1921, the mine of the Bailey-Pond Creek Coal Co., on Pond Creek on the Kentucky side of Tug River near Williamson, W. Va., was the scene of an explosion somewhat out of the ordinary. This is a new operation developing the Pond Creek bed of coal, which has never been classified as gassy. Neither was dust from this coal ever considered as being particularly inflammable. The main entry of the mine at the time of the explosion had been driven only 263 ft. The first right entry had just been turned. The coal at this point is less than 4 ft. thick and the roof is of unusual strength. In this operation all coal was shot off the solid, the intention being to install electrical undercutters later.

BIG TIMBER BLOWN CLEAR OVER HIGH HILL

This 10 x 12 in. x 12 ft. timber hurtled through the air a distance of several hundred feet. The drift timbers of both openings were scattered over the hillside.

Owing to the excellent natural drainage the working faces were quite dry. The practices followed at this mine were about the same as those used in any mine where solid shooting is the rule. Heavy charges of black powder were tamped with slack, and comparatively large quantities of this explosive were stored near the operation. The coal was shot and the smoke expelled, however, during the noon hour and again in the evening when all men were out of the mine. On the day and hour previously mentioned several holes had been fired when a blow-out shot occurred. This apparently ignited some of the smoke or inflammable gases resulting from previous shots, which in turn set off a quantity of powder stored in the mine, flame from which evidently found much coal dust in suspension, with the fan furnishing about 8,000 cu.ft. of air per minute. Conditions were thus favorable to the heavy explosion that followed. The fact that all men were out of the mine accounts for only two being killed and one seriously injured. These unfortunates happened to be near the opening and in the direct path of the explosion.

Although set in concrete, the fan was crumpled into a mass of junk and thrown across a ravine. The 10 x 12-in. timbers that had formed the roof supports of both the mine openings were blown out and scattered over the opposite hillside. One was hurled completely over the opposite hill and finally came to rest several hundred feet from its original position.

RAVINE AFTER THE EXPLOSION

Fan is to be seen in center of illustration and timber litters the whole foreground. Not for nothing is the entrance to the U. S. Bureau of Mines experimental mine made of reinforced concrete.

Some important lessons may be learned from this occurrence, and these should be absorbed by miners and operators everywhere. Those responsible for the development of this property were no more careless or less familiar with safe mining practice than other well-informed operators in the same field. The fact remains that shooting off the solid is dangerous anywhere. Accidents may be expected just as long as practices inherently perilous are adopted.

Rotary Dump for Railroad Cars for Use in Industrial Plants and Storage Yards

HIGH wages and labor scarcity have been responsible for such an increase in the cost of unloading bulk material from open-top cars that the time appeared ripe for the introduction of a dumping device of moderate cost and small power requirements. Accordingly the Robins-Scherer dump, adapted to small plants where moderate quantities of material are handled and only a small amount of power is available, has been developed and placed on the market.

This machine is built in two sizes; the smaller will discharge cars up to 90 tons and the larger up to 120 tons capacity at the rate of twenty to thirty per hour. The general appearance of this machine may be seen in the accompanying illustration, which shows the device in the act of dumping a load of coal into a track hopper. The 90-ton machine will accommodate cars from 8 ft. to 10 ft. 4 in. in width and from 6 ft. to 11 ft. 2 in. in height above the rail.

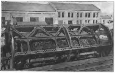
When empty the dumper is so balanced that its center of gravity coincides with its center of rotation. In dumping, the framework, which is 50 ft. long and supports a section of track above a hopper, is rotated through an angle of 150 deg. The framework barrel is supported by a circular belt at either end resting upon wheels carried on equalizing castings mounted on steel supports placed upon the foundation.

The dump is driven by a 40-hp. motor through a gear quadrant attached to the center or middle belt. A lock is provided, of course, to hold the framework in proper position when cars are either entering or leaving it, this device being interlocked with the motor control in such a way as to insure that all operations shall be performed in proper sequence.

When the car lies on its side within the dump it is supported upon two platforms each 6 x 12 ft. in area which are moved into position against the side of the car by two 7½-hp. motors operated from one controller. The holders gripping the top of the car consist of two

Revolving Dump

Such dumps are not useful solely for mines. They are being adopted at many industrial plants, for there is no easier way of unloading a railroad car. The large size will dump 120-ton cars at the rate of twenty to thirty per hour. The question arises whether this method of dumping could not be used with stock piles, the coal thus dumped being transferred by belt to any place desired.



hooks upon each side. These are brought down by power through equalizing gearing so that they all come to place with the same pressure. These hooks are actuated by a 12-hp. motor.

The chief characteristics of this machine as compared with other devices of a similar nature are low cost, gentle handling of rolling stock and small power consumption. It has been developed and is being marketed by the Robins Conveying Belt Co., of New York and Chicago.

Advice as to the Lubrication of the Ball Bearings of Mine-Locomotive Motors

By E. Ashworth*

PROPER lubrication is an important factor in the successful operation and life of ball bearings. To keep such bearings in condition they must be protected against dirt and grit, must be afforded the proper quantity and quality of grease or oil, and must be cleaned, with their housings also, at regular periods.

Provision for admitting the lubricant to the ball bearings usually is in the form of a hole tapped in the bearing cap or a pipe extending from the bearing cap to the top of the motor. When mining motors leave the manufacturer, suitable plugs or caps are provided to keep out sand and dirt. As a rule, however, the caps or plugs are missing after the motors have been in service a short time. There are several reasons for their being in that condition. They may be summarized as follows: Too frequent oiling, no conception of the damage resulting and carelessness on the part of the operator.

Manufacturers of ball bearings issue specifications setting forth the kind of lubricant needed for a satisfactory operation of their bearings under various conditions of service. It is probable that many operators do not have these specifications. As, moreover, the specifications have reference to bearings employed in many ways, it is possible that operators who have them are not sure which is suited to their particular need. The following specifications of grease and oil, therefore, are recommended by the writer as suitable for mining locomotive-motor ball bearings:

Grease	Maximum
Free Acid (calculated as oleic acid)	0.10 per cent.
Free Alkali (calculated as sodium hydroxide)	0.10 per cent.
Free Lime (calculated as calcium oxide)	0.10 per cent.
Sulphur	0.20 per cent.
Resin	none
Grit	none
Neutral Saponifiable Oil	1.00 per cent.
Abrasive materials (sand, etc.)	none
Melting point, about	190 deg.

Grease should have no tendency to become sticky. It should not contain graphite or fillers of any kind.

Heavy Ball-Bearing Oil	
Free Acid	0.10 per cent
Free Alkali	0.10 per cent
Sulphur	0.05 per cent
Ash	trace
Resin	none
Grit	none
Heat Test (15 min. at flash point) darkening, but no sediment	slight

Lubricant should be pure mineral oil and have no tendency to gum or become sticky.

	Minimum deg. F.
Flash point (Cleveland Open Cup)	[illegible]
Fire Test	[illegible]
Viscosity (Saybolt) from 300 to 500 secs. at	100

Though both grease and oil have given satisfactory service in mining-motor ball bearings it is my opinion that grease is preferable, as it is difficult to keep oil in the bearing. If oil is used the bearing should be filled about up to the center of the lowest ball. If grease is used the housing should be from one-half to three-quarters filled. When oil is used the oiling periods should be about two to three weeks apart. When using grease the bearings should be oiled every four to six weeks.

In applying the lubricant care should be taken to wipe loose dirt and sand from around the oil openings. The lubricant should be stored in closed cans and it is preferable to use a closed tank type grease or oil gun for applying the lubricant to the bearing. If a tank-type grease or oil gun is used, the hose can be arranged with a threaded coupling to fit the oil pipe or hole, thus providing quick and sure application.

The bearings and housings should be cleaned at regular intervals. Every six months is recommended. The bearings and housings should be thoroughly washed with kerosene to remove the old lubricant and then with a good light bodied oil to remove all kerosene remaining in the bearing.

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*Motor engineering department, Westinghouse Electric & Manufacturing Co.

Who Is Responsible for Industrial Waste?

By R. Dawson Hall*

After a rapid survey lasting from Feb. 7 to June 3 the Committee on Elimination of the Wastes in Industry of the American Engineering Societies has produced a remarkable and valuable report entitled "Waste in Industry," which has been published by the McGraw-Hill Book Co., 370 Seventh Avenue, New York.

So mammoth an undertaking could not but result in some dissatisfaction. Complaint may be made of the inadequacy of the investigation; more might be said as to the premises on which it is based, and some complaint made on the fact that it cannot be made truly an engineering production in that it often is a study of imponderables whereas the study of the engineer is supposed to be regarding things which can be accurately weighed and measured. Others again will say it should not have been attempted, especially by engineers. But say what may be said, it is a much fairer statement than could have been expected had it been left to those not trained to weigh matters without bias.

Seeing that engineers are largely responsible for the management of industry it is remarkable that this 387-page report puts the main burden for waste on their own mishandling of industry. We cannot conceive any other body of men who would prepare such an indictment of themselves and of their employers, with whom they have always had the most pleasing of relations. The engineer, it would seem, cannot be regarded henceforth as an upright man, but as one who leans backward. There are only three faults in industry, "mine, thine and the public's." What faults are neither provable to be thine nor the public's are zealously accepted for management. "Management," say these morbid self-analysts, "is the art and science of preparing, organizing and directing human effort applied to control the forces and to utilize the materials of nature for the benefit of man."

Is Labor Clay in Hands of a Potter?

So written the rest of the world is irresponsible clay in the potter's hands. No wonder more than 50 per cent of the responsibility is traced to management. The clay can surely do no wrong. With such a definition, the management is clearly responsible for 100 per cent of the lack of production. It has failed if it cannot control the forces of manpower and those of nature, those rated as human as well as those designated as divine. However, the report lays only 50 per cent against management, 25 per cent against labor and 25 per cent against the public.

These last figures look grossly unscientific. In the detailed report the figures are to two places of decimals; one wonders that they were not carried out as far as is *pi* by the mathematicians. Thus it is said that the men's clothing industry has an inefficiency of 48.33 per cent traceable (assayable is the specious expression) to bad management, 10.50 per cent ascribable to labor and 4.95 per cent chargeable to "outside contracts" (the public, trade relationships and other factors). The total in inefficiency is 63.78 per cent.

In estimating the faults of management it would seem that all faults of judgment and all wilful wastes are charged up. In considering faults of labor, premeditated faults are alone considered. The will to do wrong is the only charge which is assessed against labor, whereas management is assessed with all its shortcomings The ignorant workman is excused for his ignorance, however foolish; the misguided manager or the manager believed to be misguided is rated as a grievous offender because he is not 100 per cent shrewd in managing affairs in the interest not of himself but of the public.

Still there remains a value in this book, especially for the employer. If he would go to the confessional well prepared and duly humbled, here is the book for his introspectional fault finding. It is clearly his book. He should read it. Unfortunately it is not an "auricular confession." The public and labor may read it and from it may deduce, and has already deduced, that the manager is the worst of sinners, for has he not so declared himself?

He has in the definition of management arrogated to himself the possession of all the duties of right intellectual judgment as concerning the conduct of business for the benefit of the other two partners in his industry—in his case labor and the public. So, having elected to be the brains of industry, he is held for his brains as well as his morals, and he shows up twice as lacking as either one of his two partners.

The plumber or his union is to blame if he, being idle, will not avoid idleness by engaging in some other work. The miner is to blame if he stays at a slow-working plant or neglects the opening afforded by agriculture. The stenographer is to blame if when he starts work he does not contrive by industry to acquire his art immediately—we say "immediately" because the employer is not allowed any time for learning the art of managing in the particular line he may be newly attempting. The report in taking the other view is unfair. All workmen are to blame if they do not fit themselves and accept work in kindred lines when it is offered.

"In the best years," says the report, "even the phenomenal years of 1917 and 1918, at the climax of war-time industrial activities, when plants were working to capacity and when unemployment reached its lowest point in twenty years, there was a margin of unemployment amounting to more than a million men. This margin is fairly permanent; seemingly one or more men out of every forty are always out of work."

There was no report from the coal industry. Men's clothing, building, printing, boot and shoe manufacturing, metal trades and textile manufacturing are the only industries considered.

However, we who have impatiently listened to Herbert Hoover, who was president of the Engineering Societies when this activity was started, and heard him declare that the bituminous-coal industry functions worse than any other, I fear will be evil-minded enough to rejoice when we read in the report thus secured that the clothing worker is idle about 31 per cent of the year, the shoemaker about 35 per cent and the building-trade workman about 37 per cent, whereas the bituminous-coal miners were idle only 93 days in a possible 306 days, or 30 per cent. Even in 1919—a banner year—the brick, chemical and glass industries were idle 15, 16 and 13 per cent of full time, respectively.

Samples of Willful Inefficiency of Labor

The committee in making its report faced an almost hopeless task and it is feared will satisfy few. With mine workers leaving the mine at all hours of the day, with bricklayers laying 350 to 400 brick per day where they formerly laid 1,500, there are signs that the committee has been too favorable to labor. In the instance of the bricklayer there is an inefficiency of 77 per cent to add to that already existing when 1,500 bricks were laid, and to be further added to by considering the greater help furnished the bricklayer now than formerly. To this should be added loss owing to jurisdictional strikes. Doubtless a deduction should be made for the shorter time now worked.

Yet the responsibility in the building industry assayed against labor in this report is only 11.30! This shows how unreliable are the calculations that the book contains. It is, however, wonderfully illuminating and intensely interesting as to conditions in the industries, and it fails only in its attempt to evaluate numerically the causes of waste. The matter is boiled down to its essence and yet there is no attempt to do this at the expense of style. The book consequently is free from the two opposing faults which too often destroy the value of such publications—prolixity and excessive condensation.

Statistics compiled by the Engineering Agency, a technical employment bureau operating all over the United States for nearly thirty years past, show that the number of inquiries for technical help in manufacturing, construction, industrial and commercial work steadily decreased from February, 1920, to June, 1921, and since the low month of June have shown an increase. In other words the average minimum was reached in June and a slow but comparatively steady increase has been in evidence since then.

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*Editor, *Coal Age*.

Problems of Operating Men

Edited by James T. Beard

Success in Mining Coal Depends on the Right Choice of Equipment

Change from Pick to Machine Mining Requires Improved Equipment—Careful Study of Conditions Needful to Insure Success—Type of Coal-Cutting Machines Important Factor in Loading Clean Coal

REFERRING to the letter of Willam Crooks, Clinton, Ala., *Coal Age*, Nov. 17, p. 806, what seems to me of the most importance is that portion where he compares machine mining with solid shooting. I am inclined to favor his opinion regarding the relative cost of these two methods.

Studying closely the varying conditions that exist in many different mines, all working the same seam of coal, perhaps some twenty or thirty miles apart and located on the same line of railroad, we find that some of these mines were opened and worked for a time as pick mines. Then, after a few years they were converted into machine mines at a considerable outlay.

Improved Equipment Required

From the start of machine mining, the mine which had always been noted for steady work will generally be found to drop into the irregular class. Why? Because the old-style tipple arrangement was inadequate and could not compete with our great modern tipples, equipped with picking tables, loading booms and other means of screening and selecting the coal.

When the newly mined machine coal arrives at the dump it goes over the screens, coal, slate and binders together, and is loaded and shipped. Arriving at its destination, it is no wonder that a great squeal is sent back to the mine for shipping such stuff. The result is orders are canceled and the contract broken, because it called for coal and not dirt.

Study Conditions to Determine Best Type of Machine

Without a question there is a cause for this condition and some one in authority is much at fault. The officials in charge failed to study the actual conditions of the seam they were operating and, in addition, they failed to study and provide the necessary equipment for handling and preparing for market the output where the coal is undercut by machines.

In that twenty- or thirty-mile stretch, previously mentioned, the same seam may have changed, from a very clean coal free from sulphur and binders, to a seam containing both of these impurities. In that case, if machine mining is introduced it is essential to study carefully the difference between a chain machine and one of the puncher type of coal cutters.

As previously stated, a mine may be able to run practically full time, under pick mining, and, after the introduction of machine mining, the results may prove very unsatisfactory. Selecting a suitable machine requires a person who has not only had the necessary experience with machines, but understands the conditions and is fully aware that shipping clean coal will multiply orders and keep the mine running full time.

The term "solid shooting" has no application to many of our mines. A more common term is "pick-mined coal," which has reference to where the coal is properly mined, or is undercut about as deep as the height of the seam. Where good judgment is used in placing the shot and gaging the amount of powder required to do the work and not unduly break the coal the miner has a better chance to clean his coal while loading it.

Advantage of Coal Puncher

Next to the hand pick comes the puncher machine, which has one particular advantage over the chain undercutting machine, in that it can be easily made to shear the coal in the center of a room or place, or on either side, whichever appears most suitable for obtaining clean coal.

The shooting of the coal, in many of our mines, is the one thing that lessens the production of lump coal. The practice of shooting off the solid both in rooms and headings tends to smash the coal, breaking it up and mixing it with the sulphur and binders, which would otherwise be picked out by the miner and thrown back into the gob when loading his cars.

In considering the facts that are essential to successful machine mining, I would decide to underpunch and shear the coal, which calls for a machine of the puncher type in preference to undercutting chain machines, in the mining of bituminous coal.

Shooting off the solid, either in room or pillar work, in mines where the coal is impregnated with binders and sulphur, is not conducive to obtaining clean coal. Then to produce clean coal it is necessary to establish a suitable system. In pick mining, the coal must be undercut before shooting and larger coal is produced. The miner has finished the hardest part of his work when the undercutting is done. He then has more time to clean the coal while loading.

In parts of Europe, the seams are much mixed with binders and, in order to avoid dirt being loaded with the coal, the management generally adopts this method of mining where the coal is undercut before it is blasted. Solid shooting, indeed, is simply ignored in such seams and undercutting is made obligatory.

Strict Regulations Bring Results

The regulations in mining there are so strict that the finding in one miner's full-shift output of a quart of slate or bone would call for investigation by the management. If persisted in, the act would show carelessness on the miner's part and be the means of further official inquiry, and cause much trouble for the unfortunate miner who loads too much dirt in his coal. The result is that each miner takes extra care to send out clean coal.

I am satisfied that, if most of our pick-mined coal was strictly undercut before the shooting is done the more lump coal would be produced and less dirt loaded; because the chances for cleaning the coal are much greater than in solid shooting, where the coal is badly pulverized. Every miner should know he will generally get steady work by producing clean coal, which should make him more careful in loading.

Gans, Pa. **R. W. Lightburn.**

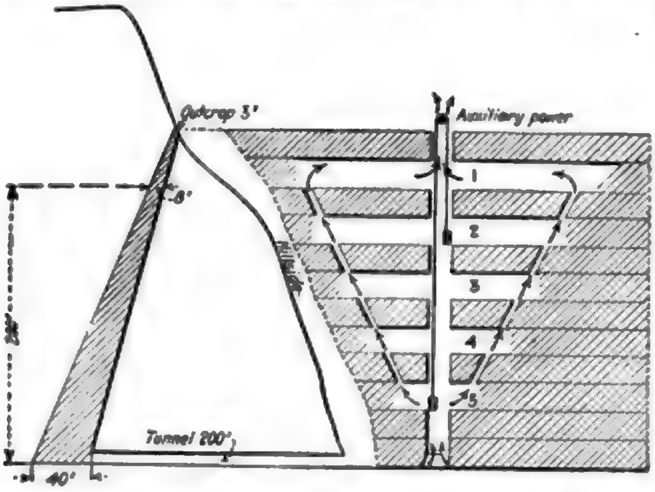
How Would You Work This Coal Bed?

Horizontal tunnel will intercept coal bed 240 ft. from outcrop—From this a rise and airway will be driven.

I HAVE been much interested in the discussion of the best method for mining vertical beds of coal. I enclose a plan recently submitted to me for the development of a bed of coal that I am holding under lease. The conditions are somewhat different from those heretofore discussed, as I have good walls and the coal can be reached from the side of the hill by a horizontal or nearly horizontal tunnel.

In reality, the problem of working a bed of this kind, however, always is the same. It consists in obtaining economical production, bringing the mine to maximum capacity as soon as possible, obtaining good ventilation, the least possible degradation of the product and maximum recovery with minimum risk to the men employed.

As may be seen from the accompanying sketch, it is proposed to drive a horizontal tunnel or haulage road into the hillside to intercept the coal bed 240 ft. from the outcrop. It is estimated that this tunnel will be 200 ft. long. Thereupon an airway is to be driven downward from the outcrop to meet the end of the horizontal tunnel. This airway will be driven in the coal and made large enough to accommodate a double skip for lowering coal to the haulage road within the horizontal tunnel or drift. Headings will be turned off the airway at regular intervals on either side. The upper headings are kept in advance of those lower down. Side airways also will be driven up through the pillars as the headings advance. Coal will be loaded into cars in each heading and lowered to the haulage road by gravity.



CROSS-SECTION AND VERTICAL PROJECTION OF SEAM

To reduce breakage or degradation to a minimum the coal will be loaded directly into cars, but when desired it can be sent down the air chutes and spouted into cars in the heading below.

As outlined this plan is said to render unnecessary the expense of mechanical ventilation, pumps or other drainage apparatus, large hoisting engines and the power required to operate such equipment. I would be glad to have the opinion of experienced miners as to the practicability of this plan of development and operation.

Detroit, Mich. C. C. **Clayberg.**

Erecting Brattice in Rooms

Practical points regarding the erection of brattice in rooms and headings—Carry brattice up on high side of opening—Reduce area at inbye end of brattice—Lap joints of canvas in direction air is traveling.

Some time ago an inquiry appeared in *Coal Age* (Oct. 13, p. 587) where a bratticeman asked for information in regard to the right way of erecting brattice in a room or heading.

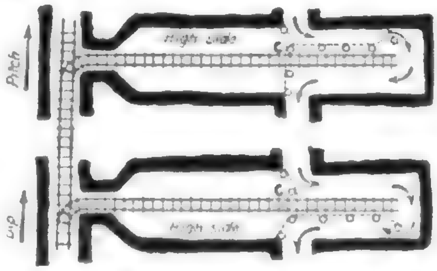
In replying to this inquiry, the usual directions were given for building a brattice; but, to my mind, several important points were omitted that might well have been mentioned. Allow me to refer to a few of these points gained from my own experience.

In the first place, let me say, one should avoid the use of canvas or brattice cloth whenever a permanent line of brattice is to be built. Cloth should be used only for temporary purposes, as when a body of gas that has accumulated at the face of a heading or room is to be removed for safe operation.

Where there is a high and a low side, my practice is to carry the brattice on the high side of the opening. As far as practicable, I prefer to give the intake side as large a sectional area as possible, making it equal to the return side whenever this will not obstruct the roadway.

In the accompanying figure, I have shown two cases. In the upper half of the figure, the air enters the room through a breakthrough on the high side and returns on the low side, after sweeping the face of the breast.

In the lower half of the figure, the air is shown as entering on the low side of the room and returning behind the brattice on the high side. It will be observed that, in each case, the line of brattice is built on the high side.



SHOWING BRATTICE ERECTED ON HIGH SIDE

Another important point, which I have found very effective in removing gas from the face of a breast, is to deflect the ends of the brattice toward the rib, so as to reduce the sectional area at that point and give the air current a greater velocity passing the face. This is shown clearly in the figure.

Practice has taught me the importance of one other point that is commonly overlooked by bratticemen. When hanging canvas, the end of the cloth is commonly tacked or nailed to the last post and the next piece tacked over this when the brattice is extended.

Instead of lapping the cloth in this manner, however, a better plan is to first loosen the end of the cloth from the post, when about to extend the brattice, and nail the end of the second strip under the first. The first piece is thus made to overlap the second so as to form a joint lapping in the direction in which the air is moving.

I have found that this plan of lapping the cloth is very effective in preventing the leakage of air through the joints. The plan may be a little more trouble than the usual method but it pays in the end.

It hardly seems necessary to mention here, a point to which attention has been called in previous issues of *Coal Age*, that the work of hanging the canvas to the posts must be performed on the intake side, as shown in the figure. No practical miner would attempt to hang canvas, working on the return side of the brattice, where he would be exposed to the gas.

Linton, Ind. W. H. **Luxton.**

Dangerous Practices in Blasting

Puncher may be used for undercutting where chain undercutter is unsuccessful — Don't mix two grades of explosives—Inadvisable to shoot off the solid.

The dangers from shooting off the solid are grave, because of the danger of a blown-out shot. Powder has not the same strength as dynamite, and if a shot is placed too far on the solid it will blow out.

When coal is too hard to mine by hand, with a pick, this process being little used today, or where a chain undercutter is not successful, a puncher may be used to undercut and shear the working face, and more lump thus produced. Mixing two grades of powder or powder and dynamite should not be tolerated because one is "quicker" and will explode before the other.

In small mines shooting off the solid is the method usually followed because of the cost of undercutting. If gas is present it should be swept away by a strong air current and dust avoided by spraying the face of the room with water. By these means the danger of mine explosions could be avoided, but great care is required.

My advice would be: Under no circumstances shoot off the solid.

Rawdon, Quebec. C. **McManiman.**

Co-operation Comes Through Leadership

Lack of progressive management in the coal industry — The average mine foreman — Relation of foreman to superintendent—Bone of contention in examination and certification — The successful boss a leader of men.

Moving along without friction is a problem for everyone to overcome. The position of mine foreman offers no exception to this rule. Bossing a coal mine is not a special condition requiring more skill than other classes of work.

Occupations of every kind are found to present their own peculiar problems. In every calling there are obstacles to overcome and the successful worker is the man who realizes this fact and has learned to control each situation as it arises.

It has been intimated, by those who pretend to know, that the coal industry lacks progressive management and, in this respect, is trailing behind other callings and occupations. The reason given for this assertion is that there exists a scarcity of men of large calibre holding official positions in coal mining.

Men who have given these matters more careful study, however, fail to reach the same conclusion. The larger coal operations today are managed by men of clear vision who are broad minded and fitted in every way to cope with the peculiar problems that confront the management of coal mines.

In the order of their importance, the men in charge of a successful coal operation are the following: Manager, mine superintendent, foreman, assistant foreman, fireboss, master mechanic and store manager. All of these are linked in the chain of operation and if any one link is not functioning properly the chain is weak. There is discord and lack of co-operation.

WRONG ESTIMATE OF MINE FOREMEN

Reading some of the letters that have appeared in *Coal Age*, one might infer that the average mine boss of today does not possess a trained mind. He is described as a "plodder," void of personal efficiency, often easily discouraged and inclined to be irritable and without tact.

If just one-half of this was true, it would be time that something should be done to create a different class of men for the position of mine foreman—a position involving the direction and supervision of mining coal on an economic basis.

Other industries have learned that the successful boss is a leader of men, standing head and shoulders above the ordinary workman, mentally. Such men never have trouble in gaining and holding the respect of the men in their charge. A characteristic of such a man is the favorable consideration he gives to all who come to him.

Mention has been made, from time to time, of the relation of the mine foreman to his superintendent. Better results might be obtained, in some instances, no doubt, if each of these men was made absolutely responsible for his own department of the work; but there is a grave question as to how such an arrangement would operate practically.

WHAT IS LACKING IN THE PRESENT SYSTEM OF MANAGEMENT

The system of making the mine superintendent responsible for the entire operation, under and above ground, has proved a success in most cases. Where the system has not been able to operate smoothly under this plan, it is clear some one has much to learn relative to co-operation and management.

The real bone of contention, in most cases, appears to be the fact that the mine superintendent is not required by law to take the examination, or hold a certificate of competency, as the foreman under him and subject to his orders is obliged to do, by law. In some cases, no doubt the examination and certification of mine superintendents would be a step forward.

However, without going further into this phase of the matter, let me say that there would be far less misunderstanding between the mine superintendent and his foreman if the former possessed the practical training and knowledge that would enable him to visit the mine workings, at least once a week, and give intelligent orders and direction regarding the work.

Weekly visits of the superintendent, passing through the entire mine, will do more to stimulate a better working spirit among the men and bring about a better understanding between himself and the foreman, concerning matters of common interest, than any number of official meetings in the office, to which the mine foreman is regularly summoned and required to explain items of the cost-sheet that the superintendent should understand from his own observation and practical knowledge.

In closing, let me say that what the coal-mining industry needs, today, more than anything else is the hearty co-operation of officials and men in every branch of the work. The successful boss, whether mine superintendent or foreman, is himself a leader of men. It is that characteristic that draws other men toward him and commands their respect and obedience.

Pikeville, Ky. GEORGE EDWARDS.

Inquiries Of General Interest

Smokestack Settled Out of Plumb

Assuming Stack a Rigid Unit, Distance Out of Plumb Is Proportional to Settlement at Base—Danger Due to Wind Pressure and Lack of Stability of Construction—Reference to Leaning Tower of Pisa

CAREFUL measurements taken at the base of a brick stack have shown a settlement of one inch, on one side of the base, which rests on a solid masonry foundation. The stack is 165 ft. high and measures 25 ft. in diameter, at the base, and 6 ft. in diameter, at the top. The question has been asked, how much is the top of this stack out of plumb. SUPERINTENDENT.

Briceville, Tenn.

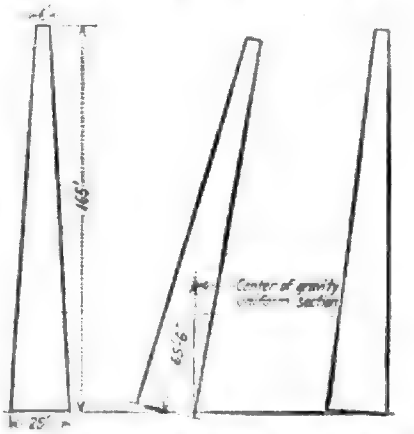
The question of ascertaining how far the top of this stack is out of plumb is solved by a simple proportion if the entire stack is considered as a rigid unit. For example, the settlement on one side of the base being one inch shows a movement of one inch in 25 ft. Then, the movement at the top of the stack will be as many inches as the height of the stack is times greater than the base; or 165 ÷ 25 = 6.6 in.

Just here, it might be well to ask the further question: Is this stack in danger of falling? Also, what further settlement must take place before the situation becomes dangerous?

These questions can only be answered in a general way, as the elements entering into the problem are largely indeterminate and no data are given that would enable a fair calculation of the height of the center of gravity of the stack above its base.

The fact that a settlement of one inch has already taken place, at the base of this high stack, raises a grave question as to the nature of the substratum on which the foundation rests. It may be that this is such that no further settlement need be anticipated. Assuming that to be the case, if the stack has been properly designed and rests on a substantial stone foundation, the thickness of the brick wall decreasing in proportion to the height above the ground, there is no reason to be alarmed by reason of the present settlement. This should be carefully watched, however, to ascertain that it goes no further.

The accompanying figure shows three conditions, which are assumed on a purely theoretical basis, as a means of discussion only. On the left of the figure the stack is shown erect, while on the right it is tilted sufficiently to make one side vertical.



Again, between these two positions just mentioned, the stack is shown tilted so that its weight, acting through an assumed center of gravity, passes through the edge of the base. In this case, the center of gravity was calculated for a uniform thickness of wall, from the bottom to the top of the stack, which is far from being the case in a properly designed stack, where the center of gravity would fall much lower than that shown in the figure.

Neglecting wind pressure and assuming that the structural strength of the material is sufficient to prevent rupture, theoretically the stack would stand as long as the vertical line through its center of gravity falls within the area of the base.

It is compliance with this law of physics just stated that has enabled what is probably the most famous out-of-plumb structure in the world—the Leaning Tower of Pisa—to survive the centuries since its erection. Unfortunately, however, the bond in brick masonry and the bricks themselves are mechanically weak, and wind pressure also cannot be neglected with impunity.

Taking these facts into consideration, it might be assumed that the danger point has reached its extreme limit when one side of the stack is vertical, as any further movement in that direction would give rise to a sliding tendency in the bonding of the material. This condition is reached when the out-of-plumb distance of the top equals half the difference of the top and bottom diameters; or, in this case, ½ (25 − 6) = 9½ ft., corresponding to a settlement at the base of 12 (9½ × 25) ÷ 165 = 17.27 in.

As a matter of fact, however, this stack would probably become decidedly unsafe long before any settlement of this magnitude had taken place. How far the settlement at the base may be allowed to proceed before this stack should be considered dangerous is a question of judgment. We would suggest that a settlement of six or eight inches, in this case, would be an extreme limit of safety.

Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

QUESTION—*If water weighs 62.5 lb. per cu.ft., and steam, at atmospheric pressure, has 1,640 times the volume of water from which it was generated, what weight of steam would be used, per hour, by a pair of engines, 30-in. cylinders and 5-ft. stroke, making 30 r.p.m. and discharging steam at atmospheric pressure?*

ANSWER—In general steam practice, the terminal pressure in the cylinder, at the moment of release when the exhaust value opens, is considerably above the atmospheric pressure, for non-condensing engines, which is a common type of hoisting engines installed at mines. For this reason, the only assumption that will make possible an intelligent answer to this question is that the steam in the cylinder expands down to atmospheric pressure at the moment of release. Even on this assumption, the calculation would be practically worthless since no allowance is made for condensation and clearances, which always form a very considerable percentage of the total quantity of steam consumed.

However, ignoring these two factors, condensation and clearances, and assuming there are four compressions in the steam in the cylinder previous to cutoff, if the engine cuts off at ¼ stroke, the steam will have expanded down to atmospheric pressure, at the moment of release, very nearly. Under this assumption, the cylinder displacement, in cubic feet per minute, or per hour, will give approximately the volume of steam consumed in that time, measured at atmospheric pressure; and if this is 1,640 times the volume of the water from which it is generated, the weight of steam will be given by dividing the cylinder displacement, in cubic feet, by 1,640 and multiplying the result by 62.5.

In the present case, the area of each 30-in. cylinder is $0.7854 \times 30^2 = 706.86$ sq.in. The piston displacement, per stroke, for the two cylinders, is then $2 \times 5 \times 706.86 \div 144 = 49.09$, say 50 cu.ft. An engine running at 30 r.p.m. makes 60 strokes per min., which gives for the total piston displacement, per hour, $50 \times 60 \times 60 = 180,000$ cu.ft. On the assumed basis, the weight of steam consumed per hour is, then, $180,000 \div 1,640 \times 62.5 =$ say 6,860 lb.

QUESTION—*How would you open and close the valves to start and stop an engine, as quickly or as slowly as possible? Give reasons.*

ANSWER—Steam is compressible, and the effect of the sudden arrest of the flow of steam is not like that when a flow of water is suddenly arrested by the closing of a valve. The sudden opening or closing of the steam valve or throttle will produce no other effect than a possible derangement of the rope connections on the cage or the position of the rope on the sheave or drum, provided the momentum of the cage is such as to produce a slack rope when the winding drum is arrested too suddenly by shutting off the steam and applying the brake. It is important, however, in hoisting, to start the engine slowly, so as to overcome the inertia of the cage gradually and not produce an undue strain on the rope connections and other parts of the winding gear.

QUESTION—*If a circular shaft, 28 ft. in diameter and 200 ft. deep, is half-full of water, what horsepower will be required to pump it dry in 10 days, working 24 hr. per day?*

ANSWER—The cubic contents of this shaft, for half its depth, is $100\ (0.7854 \times 28^2) = 61,575$ cu.ft. Taking the weight of a cubic foot of water as 62.5 lb., the weight of water in this shaft when it is half-full is $61,575 \times 62.5 = 3,848,437$ lb. The average height that the water must be lifted being 150 ft., the effective work performed per minute is

$$\frac{3,848,437 \times 150}{10 \times 24 \times 60} = 40,087 \textit{ ft.-lb.}$$

The required horsepower, ignoring friction, is therefore $40,087 \div 33,000 = 1.21$ hp.

QUESTION—*What is meant by a windy shot and what is its cause?*

ANSWER—The general meaning of the expression "windy shot" is a shot in which the force of the explosion is, in part, expended on the air, producing a heavy concussion of the mine air.

This effect may result from any one of several causes. For example, an excessive charge of powder; the seaming out of the shot in a soft stratum of coal; ineffective stemming or tamping of the shot; or the blowing out of the shot through crevices in the coal may produce a windy shot. A similar effect is produced, at times, when different grades of powder are used in making up the charge, the finer powder exploding first and blowing the coarser powder into the air where it is burned. A windy shot may result, also, from the use of coal dust or slack in tamping the charge.

QUESTION—*What are the dangers incident to windy shots?*

ANSWER—A strong concussion of the air, caused by a windy shot, will raise a cloud of dust, which may be ignited by the flame of the shot and produce a local dust explosion. Whenever gas or dust is present where a windy shot occurs the flame of the shot will travel a considerable distance down the room and may extend out on the entry.

QUESTION—*When two kinds of powder are used in the same hole, what is likely to be the result?*

ANSWER—The finer powder ignites more quickly and its explosion will blow the coarser powder from the hole, with the result that the latter is exploded on the air, producing a heavy concussion of the air and raising a cloud of dust, which is at once ignited and adds to the force of the explosion.

QUESTION—*Could a safe shot that did its work immediately succeeding a windy shot, produce a disastrous explosion?*

ANSWER—Yes. The dust cloud and gas produced by the windy shot will generally be ignited by the flame of the succeeding shot, which would otherwise be safe, and a more or less local explosion of dust and gas result.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

CONDITIONS in the United States today indicate that the year 1922 as a whole will be more satisfactory to business than the year just ended, according to January *Commerce Monthly*, published by the National Bank of Commerce in New York. "Our forecast," the publication continues, "is that profits will depend more on ecomony of operation than on expansion of volume. With the money favorable factors now operating, business men should not fear to make plans for the new year, but they should plan with care and conservatism, and with constant effort toward reduction of costs.

"Financial improvement continues. Progress has been made in reduction of excess stocks of manufactured goods. Accumulations of raw materials have been reduced. The rate of production in the major industries have shown little change during the closing weeks of the year. Losses in some lines have been offset by gains in others, the net result being that the gains over the low level of the earlier months of 1921 have been held.

"Retail trade during the last three months has been better than was justified by agricultural and industrial conditions, even though it has been disappointing to those who as yet have failed to recognize that the public has little inclination for maintaining, under present conditions, the various profits between original production and sale to the consumer.

"In most wholesale lines the closing weeks of the year are normally dull, with the approach of inventory period. Quietness is more marked than usual this year because of doubts as to the volume of spring trade. Reduced purchasing power forces those classes of consumers which represent the bulk of demand—farmers, wage earners and salaried people—to direct their buying into the low and medium-priced lines of goods, and there is uncertainty as to the extent of their purchases.

"International trade is slowly returning to old channels. Throughout the world there is a determination to work and to save. Above all, producers and consumers of every country must set themselves against the waste of and the preparation for war. The economic structure of the world can no longer bear the burden involved. Peace is the only foundation on which man can build, and fortunately the progress of discussions at Washington is bringing definite assurances of constructive results."

Orders for 25,000 Cars Pending

Chicago reports, according to the *Iron Age*, give encouragment as to car orders. About 25,000 freight cars are expected to be placed in that district early in the year, whereas for the whole country 1921 yielded only 20,000. The Burlington probably will close for 7,300 cars soon and the Illinois Central will take early action on 2,200. The Seaboard Air Line, besides buying 25 locomotives, has placed 2,000 to 2,500 cars with the Fairfield (Ala.) plant. For the Norfolk & Western 4,000 cars are under negotiation. The Union Pacific has increased its recent inquiry for 1,500 freight cars to 5,500. Rail buying is not on the scale of a year ago. Upward of 400,000 tons are under contract for 1922 and the Pennsylvania order is an early prospect.

Locomotive Shops Re-employ 400

Four hundred men, employees of the West Springfield (Mass.) locomotive shops of the Boston & Albany R.R., resumed work Friday, Jan. 6, when the shops reopened after two weeks' shutdown. The layoff was due to business conditions.

Copper Mines Will Resume

Many copper mines are to resume operations this month, among them Anaconda, Butte & Superior, North Butte, Davis Daly and Tuolumne, according to reports current in Boston. Kennecott produced 4,914,000 pounds of copper in November, compared with 4,277,000 pounds in October and 11,146,000 pounds in November a year ago.

Ford Plant Reopens

The Ford Motor Car Co.'s Highland Park plant, which closed Dec. 22 for inventory, reopened Monday, Jan. 9. "We will keep 40,000 men on the payroll," Edsel B. Ford, president of the Ford Motor Co., said. "Only 32,000 men will be working at any one time. However, we will continue to rotate our men so that employment will be given the greatest number." Business conditions will improve slowly but steadily during 1922, he expects.

Nail Plant to Blow in Furnace

The Kelly Nail & Iron Co. reports that its Sarah furnace at Ironton, Ohio, will blow in early in January.

Paper Mill Increases Force

The Northern Paper Mill of Green Bay, Wis., is not only back to normal but is employing fifty additional men and making plant extensions to care for a banner year in 1922. All its machines are operating night and day to create a reserve stock. Judson G. Rosebush, the manager, told his sales force in conference that liquidation, easier money, better exchange rates, and the disarmament conference insured an early end of depression. The sawmill of the Diamond Lumber Co. at Green Bay, closed since July, reopened on Jan. 3, due according to J. T. Phillips, the manager, to prospects for a building boom.

Idle Freight Cars Increase

Idle freight cars on Dec. 23 numbered 552,373, an increase of 21,036 compared with Dec. 15, it was shown in a report issued by the Car Service Division of the American Railway Association. Of the total, 404,214 were surplus freight cars, an increase of 32,993 over the total on Dec. 15. The report showed that surplus coal cars numbered 197,232, an increase of 10,724.

To Erect $500,000 Steel Plant

The Great Southern Steel Corporation has qualified with the State of Alabama for the erection of a $500,000 plant at Birmingham, Ala., for the manufacture of steel products. The company, which is a Delaware corporation, is capitalized at $15,000,000 and owns 10,000 acres of coal and ore lands in Etowah and adjoining Alabama counties.

Further Pre-eminence of Coal as Fuel Seen with Exhaustion of Mexican Oil Wells Near

Several Major Pools Ruined by Salt Water—Yield of Others Curtailed—Producing Wells Subjected to Excessive Exploitation to Maintain Output—Large Companies Take to Colombia Field

By H. S. Law

(Written for *Coal Age*)

With several of the major oil pools of Mexico practically ruined by salt water and the production of other areas becoming increasingly smaller due to the same cause, the coal industry of America, and in fact the coal trade throughout the world, can look forward to the coming year as promising interesting developments.

The Mexican fields, which in recent years played a most important part in keeping the fuel oil market of the world supplied, if not oversupplied, with cheap liquid fuel are now rapidly approaching a crisis. One by one fields noted for their wonderful productivity have collapsed with nothing in sight to take their places.

Those who are closely watching the Mexican oil situation and studying the probable effect of salt water encroachments from the viewpoint of the coal industry believe that not before well along in the year will the cumulative effect of what has taken place and what is taking place in the Mexican oil fields become actually felt in America and elsewhere.

If the exhausted valuable oil-producing properties were confined alone to the Panuco-Topilo (heavy-oil) fields of Mexico the situation would not be so serious from the viewpoint of those companies operating in that country, but the fact that many of the remarkably prolific pools constituting what is generally known as the "South Fields" (light-oil district) have already been ruined and that others are going that way creates a situation which, to say the least, is decidedly favorable for those engaged in producing and marketing coal.

The failure of some of the great pools in the "South Fields" is exceedingly important in view of the fact that the producing sectors or pools in that territory have in the past produced more than 600,000,000 barrels of oil, or 75 per cent of Mexico's output.

While about 80 per cent of Mexico's light crude finds its way into the fuel oil market, the remaining 20 per cent represents its yield of gasoline, kerosene and lubricants. The heavy oil of the Panuco fields is used almost entirely as fuel oil. It has not been much of a factor, however.

Entire Production Now Limited to Few Fields

While it cannot be denied that Mexico is still producing a large amount of oil its real weakness lies in the well-known fact that practically all its production, notably in the "South Fields," is now being taken from two or three pools, whereas a year ago almost three times as many pools were producing clean oil in large quantities.

Excessive exploitation of these much overworked producing zones to keep up production is subjecting them to a test unequalled in the history of the oil fields of that country. Competitive drilling and mad haste to get out oil while it is being produced free from salt water tends to early exhaustion. Oil producers are most anxious that such an event be postponed, at least until these fields have produced considerably more oil. Under present conditions men now engaged in the producing areas are singing, "Where Do We Go from Here?"

At present practically the entire burden of production is falling on the pools or sectors in the light-oil district known as the Cerro Azul and Toteco. These pools are now producing approximately 400,000 barrels of oil a day, and pipe lines that have been rushed into these pools have a capacity for transporting that amount of oil.

Some geologists estimate that under present conditions the Cerro Azul and Toteco pools may hold up three or four months longer, even allowing for the way the fields are being drawn upon by the pipe lines. The appearance of salt water in either pool would mean the rapid decline of the only important light-oil producing area in Mexico and would mark the closing chapter of the story of the celebrated "South Fields," which have done more than any other territory to make Mexico the second largest producing country in the world.

The chief reason why the downfall of many of the most important producing fields of Mexico is receiving so little attention at this time is that, despite the destructive work of salt water intrusion, shipments of oil from that country are still large. The fact that salt water has greatly reduced the number of producing areas, forcing the comparatively few zones that as yet are free from salt water to make up the decline in production suffered in the fields already abandoned and others slowly nearing exhaustion, naturally won't have much effect on the average man just so long as he knows that shipments are being made from Mexico in good-sized quantities.

At this writing Mexico as an oil-producing nation—as a country which last year produced 27½ per cent of the world's oil supply—has a maximum future of about four months, according to some well-known geologists. Within that time, it is said, new fields with large production must be brought in, else Mexico's shipments will dwindle down to unimportant quantities.

Users of Oil Fuel Face Serious Problem

There are some interests, however, which are well aware of what is happening in Mexico. They have reason to feel somewhat worried about developments in the oil fields of the southern republic, for they have in recent years relied too much upon that country. Believing that fuel oil would always be a drug on the market, due to Mexican production, many industrial and marine companies have been relying on fuel oil to a degree which now, naturally, causes considerable discomfort. Converts to fuel oil find it difficult to admit that they are confronted with a serious problem. Some, however, who have seriously studied the possible result of the elimination of Mexico as an oil-producing factor are frank to admit that should that take place in the near future fuel oil prices would be such that coal would take its place where economy in operating costs was the watchword.

The hope that some time, somewhere in Mexico, another new and great oil field or fields—another "South Fields"—will be uncovered has done much to minimize the economic results of the threatened peril in the Mexican oil fields. Regardless of all these hopes no new field or fields separate and distinct from the old ones has been uncovered in Mexico since the time salt water first made its unwelcome appearance there. Operators in the Mexican oil fields have not yet discovered the presence of any possible successor to the famous "South Fields" now undergoing a tremendous strain. During all the time salt water has been percolating through the old areas, turning most valuable properties into desert lands, oil operators in that country have been searching diligently for new producing fields. Their efforts so far have been in vain.

Assuming that new fields are discovered, the cost of producing from them will be very high. It is generally agreed that whatever new territory is opened up it will be considerably different from the old producing areas located near the sea coast, where operating costs were at a minimum and where the presence of oil was, to a large degree, determined by oil seepages. In searching about the interior or near interior of Mexico for prospective oil fields, operators will have to proceed by first selecting acreage that looks favorable and trying it out by the costly method of test drilling. The most optimistic oil operators in Mexico expect only ordinary wells of the 1,000-barrel per day class in whatever new fields may be developed inland, the "gusher" type of producers so common in the old fields being considered out of the question in future oil developments in that country.

There is not much incentive for companies that have heretofore been operating in the cheap gusher fields of Mexico to continue their operations in other sections of that country, which may produce a fair volume of oil, but at a maximum of cost.

In reviewing the Mexican oil situation the Standard Oil Co. of New Jersey, in its official publication, *The Lamp*, referred to the prospects of higher operating costs, etc., as follows:

"It should be remembered that further back from the sea coast the greater is the expense of producing and moving the oil. As has been pointed out in these columns heretofore, the cost of building roads, pipe lines and railroad connections is, as a rule, much greater than the actual drilling expense. If foreign companies could have foreseen the difficulties (political) other than those purely physical which have attended their efforts to profit by the development of Mexican oil areas, they would never have invested the huge sums which have gone into the present producing fields. To go further inland, even if it were definitely known that the present wells could be duplicated, would require inducements which are not offered by the present conditions covering production in Mexico. Under prevailing taxes it would be manifestly impossible to earn a profit on the millions of dollars which will be required to explore, drill, construct roads through difficult country, lay pipe lines and take care of all of the other needs of a producing business.

"All of the oil taken from Mexico today has come from big wells, where the cost per barrel has been down to the minimum. If Mexico is to continue to figure it will be necessary to assume the heavier cost per barrel of getting oil from small wells. This work is not justified by the prevailing margin of profit after paying taxes."

ATTRACTIVENESS OF MEXICAN FIELD NEAR END

American refiners in seeking Mexican crude oil in past years did so because of its low cost and ample supply. By the elimination of these elements the attractiveness of that country as a crude oil producing source will cease.

There are many who predict that long before any new and important field or fields is developed the present sectors will decline in production to the point that will cause the companies operating there to fall back on storage stocks entirely, and inasmuch as these stocks have been liberally drawn upon in recent months in order to move out stored oil before the threatened increase in the Mexican export oil tax is imposed, aid and comfort derived from Mexican oil storage tanks will be of short duration.

Suspension of oil shipments from Mexico for any length of time or Mexican oil shipments reduced to a small volume would bring about a real sensation in the oil industry of America because the great refining plants of the more important oil companies located on the Atlantic seaboard and the Gulf Coast have been expanded to their present size because Mexican crude oil was always available in large quantities. With their modern cracking processes, these plants were always able to utilize enormous quantities of Mexican light crude, mixed with smaller amounts of American light oil, and from that mixture valuable refined products were obtained, fuel oil being about the last run from the plants. These companies developed their tidewater refineries to enormous size on the assumption that the Mexican light-oil fields would for many years produce an unlimited supply of cheap oil. Complete failure of the Mexican fields would mean that those refineries would have to turn to the oil fields of America, or possibly South America, for supplies. Under such circumstances it is certain that prices of American oil will advance to new high levels. By greatly increasing refining costs there will come sharp advances of refinery products. This, of course, will include fuel oil.

Action on the part of the large buyers of American crude oil in recently advancing the price of mid-continent crude 100 per cent within a period of a month was prompted, according to well-informed oil men, entirely by the desire of refining interests of this country to encourage production here in order to meet the situation that is developing as a result of the failure of the Mexican fields. Realizing that the Mexican situation would make it necessary to use more and more American crude oil, the major oil organizations of this country, according to reliable authority, sharply jumped the price of American crude, with the result that production in this country was stimulated.

Inasmuch as fuel oil is to a large degree a refinery byproduct it is scarcely necessary to say that when refineries find they must depend entirely on high-priced American crude, fuel oil will advance in price. There always will be fuel oil available for those who are willing to pay the price for this commodity produced under much higher costs. When that time arrives fuel oil will lose much of its attractiveness as a power-generating factor, and many of those now using it will be in the market for coal. The critical situation in Mexico now makes it possible for men engaged in producing and marketing coal to smile at those who, up to a short time ago, predicted that a cheap, unlimited supply of liquid fuel would tend to reduce the importance of the coal producer and distributor.

Much has been written about the potential oil reserves of Mexico. There is something fascinating about estimating the amount of oil which may be found beneath undeveloped territory, but the only agency that will finally determine whether oil does or does not exist is the drill bit.

BIG COMPANIES NOW LOOK TO SOUTH AMERICA

An interesting fact in connection with the potential oil reserves of Mexico is that the Standard Oil Co. of New Jersey, which in the past has derived much oil from the Mexican fields and later suffered severe losses there, is now turning to Colombia, South America. The Standard has acquired a large amount of acreage in Colombia and is proceeding with a campaign which leads many to believe that it considers that country the big oil reservoir of the future. Recently the Standard Oil Co. of California in reaching out for foreign oil fields passed over Mexico entirely and acquired a controlling interest in more than 1,000,000 acres of Colombia lands located on what appears to be good geological structure. The Texas Company, one of the largest independent oil companies of the country, also has entered the Colombian fields, despite all that has been said regarding the "limitless possibilities of the potential oil lands of Mexico."

Although there is absolutely no indication at the present time in the way of advances in the price of fuel oil as to what is developing in Mexico, there is, however, one fact that is quite noticeable; that is the abandonment of the fuel-oil propaganda campaign spread broadcast up to a short time ago. There is no longer heard anything about propositions to lay pipe lines under the highways and byways of the great centers of population and in the industrial centers of the country and in this way serve fuel oil just like a city water supply. The trouble with schemes of that sort is that conditions make it impossible to contract for fuel oil for anything like a long period. The truth of the matter is that the larger oil companies do not want to sell any great amount of fuel oil at present prices. They are not looking for business. They are, however, storing plenty of fuel oil, using for that purpose every available inch they have.

While oil companies with plenty of steel tanks can quite readily store away oil, the average consumer of fuel oil has not the facilities for doing this. Fuel oil cannot be thrown into a vacant field and held there until wanted. Steel tankage is essential for keeping oil, and steel storage costs considerable money to erect.

November Mine Fatalities 51 Less Than Year Ago; Ratio to Output Higher

IN the month of November 146 men were killed in and about the coal mines of the United States, according to reports received by the Federal Bureau of Mines from the various state mine inspectors. The figures represent a decrease of 51 fatalities, or about 26 per cent, as compared with November, 1920, in which month 197 men were killed at coal mines. Based upon an estimated output of 42,814,000 short tons in November, 1921, the fatality rate is 3.41 per million tons produced. The rate was 3.34 in November, 1920, when the production of coal was 58,898,000 tons.

Of the 146 fatalities, 105 were at bituminous mines throughout the country and 41 at the anthracite mines in Pennsylvania. Fatal accidents at Pennsylvania bituminous mines numbered 23, a decrease of 6 as compared with November a year ago; there were 20 fatalities in West Virginia, a decrease of 6; 16 in Illinois, a reduction of 2; 10 in Ohio, a reduction of 1; 6 in Alabama, a decrease of 13; and 5 in Kentucky, a decrease of 13.

During the first eleven months of the present year 1,794 men have been killed by accidents at coal mines, against 2,077 killed during the corresponding months of 1920, a decrease of 283 fatalities, or 14 per cent. The output of coal for the same months was 457,259,000 short tons in 1921 and 584,641,000 tons in 1920, a decrease during the present year of 127,382,000 tons, or 22 per cent. These figures represent a fatality rate of 3.92 per million tons in 1921 and 3.55 per million tons mined in 1920.

The Public and the Price of Coal

(Editorial from the Chicago Journal of Commerce, Nov. 22)

THE coal committee of the Chicago Association of Commerce has unearthed some pertinent facts regarding the present cost of coal delivered to the consumer. It is a matter of record that coal today—anthracite, chestnut and range being used as the basis of comparison—is $7.70 more the ton than it was in September, 1914. Immediately the *Chicago Tribune* rises up to brand the coal operators and dealers as profiteers. But the Association of Commerce went a step further than the mere discovery of this $7.70 increase. They also traced the reason for this increase, thus giving the matter an entirely different aspect.

In September, 1914, local consumers paid $7.90 a ton for their anthracite. In the same month last year they were paying $15.60 a ton for the same grade of fuel. But, according to the report of the Association of Commerce, there has been an increase of $2.57 per ton in miners' wages. There was an increase of $2.67 per ton in freight rates. There was an increase of $1.10 per ton in other operative costs. There was an increase of $1.36 per ton in local delivery and yard costs. Figure this up and it will be found that the total increase in costs was exactly $7.70. This proves definitely enough why it has been found necessary to increase the cost of coal delivered to the consumer over the figure of 1914.

The *Tribune* in attacking the coal industry generally, draws a comparison between what it calls $10 coal and $1 wheat. In doing so it insults the intelligence of the public, for it figures its coal costs on a basis of coal delivered, while its wheat costs are as of wheat in the farmers' bins. Had it figured its coal on the "at-the-mines" basis, the result would have been entirely different. This, however, is not the *Tribune* method. In its pose as the friend of the people, in which it indulges in mock heroics that cost it nothing but its reputation for veracity, but which serve to cloak its greed and selfishness when it has an axe to grind, it hesitates at nothing. The mere fact that it is making a malicious attack upon a basic industry which had done everything within its power to lower the cost of fuel, does not worry the *Tribune*. It evidently believes the general public is blind enough and stupid enough to swallow its pronouncements whole and that in this way it will win the friendship of those it probably hopes to use for its own purposes when the time is right.

But Chicago business men know full well that the investigations made by the Association of Commerce are complete and authoritative and that this body in undertaking this work has only the interests of the public at heart. The report of the Association of Commerce committee makes the *Tribune's* distorted facts appear in their true light, and if the *Tribune* is capable of shame, it has good reason to hide its head, now that it has been found out.

It is beyond the realm of reason to talk cheaper coal until the railroads see their way to reduce the freight rate on the commodity. There is also one other solution to the high cost of coal problem, and that is entirely beyond the power of the coal operators and the coal dealers. This is the question of miners' wages. This class of labor is working under a contract the terms of which were fixed by the United States government at a time when living costs were inflated and there was need for high wages. In some parts of the country the miners have voluntarily accepted a wage reduction in keeping with present deflation. This has not been done, however, in those regions controlled by the Mine Workers' Union. The organized miners have absolutely refused to consider a wage cut, but on the contrary are agitating for the higher wage under the new contracts which are to be made next spring.

The matter is up to the people of the United States. If they would see a speedy decrease in the price of coal then let them bring to bear sufficient pressure to force the union miners to work for a wage commensurate with the present cost of living. Men in other trades, men whose work requires just as much labor, just as much risk and just as much skill as that of the miners, have submitted to wage reductions, thereby doing their part in bringing about a general deflation of all prices. But the miners, belonging to an organization which is arbitrary in the extreme, have exhibited no such altruistic tendencies.

West Virginia Engineers May Now Register

THE act to regulate the practice of professional engineering in West Virginia became effective July 27, 1921, and the date beyond which it will be unlawful to practice as a "registered professional engineer" is Jan. 27, 1922. Registration of persons who prior to the time of the passage of the act engaged in the practice of engineering is not compulsory, but such persons cannot use the title which the act provides. Application forms will not be sent out except in response to the request of individual engineers addressed to George E. Taylor, secretary, State Board of Registration for Engineers, 504-507 Coyle and Richardson Building, Charleston, W. Va. The official roster will include mining, civil, structural, mechanical, electrical, metallurgical and chemical engineers. The board is comprised of N. H. Mannakee, Bluefield; H. C. Cooper, Clarksburg; Frank Haas, Fairmont, and George E. Taylor, Charleston. Engineers legally qualified in some other state may practice in West Virginia for thirty days without obtaining registration if they do not take permanent residence therein. The registration fee is $20. Employees of an engineer or a registered engineer do not have to register unless they desire to take responsible charge of design or supervision.

Federal Reorganization Covers Coal Report

SINCE the whole matter of the reorganization of the federal departments is to be the subject of an early executive recommendation, it has been decided to make no change in the manner in which the weekly coal report is being issued. As a result of a recommendation by the directors at the National Coal Association consideration was given to the transfer of the weekly coal report from the Geological Survey to the Department of Commerce. There was opposition to the plan, however, and Commerce Secretary Hoover has announced that he regards the matter as one best handled as a part of the general reorganization plan.

BUSINESS LOOKS A LITTLE WAN—but not from lack of rest.—*Chicago Journal of Commerce.*

Georges Creek and Potomac Coal Operators To Discuss Wage Reduction With Miners

BOTH operators and mine workers in the Georges Creek region, realizing that a readjustment of wages is necessary if the mines in that field are to be operated, will hold meetings in the near future with a view to determining just what change in the agreement can be arranged. That the miners are not averse to accepting a cut is indicated by the fact that committees have been designated by the various local unions in the field to confer with a committee of operators.

Although the miners have not said just how much of a cut they will be willing to accept, the understanding is that they are prepared to accept a reduction of 25 per cent in mining rates, if by so doing they can be assured that they will have an opportunity to work regularly. The present mining scale in the upper Potomac and Georges Creek regions is $1.31 a ton. With that rate in effect operators say it is impossible to compete with non-union producers.

With a scale between 25 and 30 per cent lower than that heretofore prevailing the Manor Coal Co. has resumed operations in full at its mines at Vindex, in the upper Potomac field. The normal output of this company is about 1,000 tons a day, 200 men being employed at this plant. The reduction in wages was made as a result of the meeting of miners. A similar move is on foot in negotiations between the Dodson, Emmons and Smith interests and their employees.

Brings Action to Settle Debit and Credit Accounts of Tidewater Coal Exchange

A SUIT which has for its object the settlement of accounts between the debit and credit members of the Tidewater Coal Exchange has been brought in the Supreme Court of New York County by the Delaware Steamship & Commerce Corporation, a credit member of the exchange. The plaintiff, formerly known as Matthew Addy Steamship & Commerce Corporation, brings through its counsel, T. K. Schmuck, of New York City, the suit on behalf of itself and other credit members and shippers, more than 120 in number, against all debit members and shippers and asks for an accounting by them of the value of the coal, as fixed by the Executive Committee of the exchange for which they are debit members or shippers. According to the complaint, the plaintiff is a credit member for 5,040 tons of coal and is a debit member for 580 tons.

The defendants named in the complaint include William R. Coyle, trustee in bankruptcy of the exchange, and more than seventy coal companies and shippers who, the complaint says, "are either debit members of or debit shippers to said exchange. Plaintiff has no knowledge as to whether each of said defendants is respectively a member of or a shipper to said exchange."

The complaint says that during the existence of the exchange there were more than 72,000,000 tons of coal shipped to the exchange "to be held by said exchange for said members and shippers respectively who consigned the same."

The complaint further says that "upon information and belief, there is due to credit members of and credit shippers to said exchange, including plaintiff, jointly from the debit members and debit shippers the aggregate sum of $1,182,034.36, being the price fixed by the executive committee of the exchange for coal for which they are debit members or debit shippers, but plaintiff has no knowledge of the sum due severally from each of said debit members or debit shippers, defendants herein."

The plaintiff corporation demands judgment as follows: That the right, title and interest of William R. Coyle, trustee in bankruptcy, in and to the subject matter of this action be determined; that the status of the accounts of the defendants, other than Mr. Coyle, with plaintiff and with other credit members of and credit shippers to the said exchange be determined and declared; that the status of the account of the plaintiff as a debit member of the exchange be determined and declared; that the defendants, other than Mr. Coyle, be severally ordered to pay to plaintiff and to other credit members of and credit shippers to the exchange such sums as may be determined to be due them, and for such other and further relief as the nature of the case may require and as may be just and equitable, together with the costs and disbursements of this action.

It is the contention of the plaintiff that when a member shipped coal to the exchange he did not waive title to it but became a tenant in common of the coal in pool in proportion to his shipment, and that when a debit member withdrew more coal than he owned in pool, he became a debtor for such coal to the owners of such coal. It will also be contended that the exchange was neither a debtor of the credit members nor a creditor of the debit members, but was merely a clearing house or bookkeeping establishment that kept a record of the members' accounts, acted as their agent in allotting coal and in fixing the prices thereof.

The theory of the pending suit will make possible the collection of moneys from the debit members in a single action, whereas under any other theory a separate suit against each debit member would have been necessary. Whether the suit will be affected by the bankruptcy of the exchange depends largely on the decision of the U. S. Circuit Court of Appeals in the bankruptcy case, which has not yet been handed down.

Keeney, Mooney and Blizzard Imprisoned

BAIL was denied to C. Frank Keeney, president of District 17, United Mine Workers of America; to Fred Mooney, district secretary-treasurer, and to William Blizzard, president of a sub-district, when arraigned in the Circuit Court of Logan County, West Virginia, on Dec. 28, and the three officials of the miners' union were remanded to jail for the time being.

They had surrendered themselves to Don Chafin, Sheriff of Logan County, at Huntington on the day following Christmas, with the understanding that they were to be given full protection, the Logan Sheriff making that guarantee. It was through the instrumentality of the Logan Sheriff that they were permitted to enjoy Christmas with their families, notwithstanding the fact that capiases from Logan County were pending against them.

Keeney, Mooney and Blizzard were arraigned before Judge Bland charged with conspiracy by the Logan County Grand Jury, such charges growing out of the armed march of last August and September. The three defendants face the same charge in Kanawha County. Harold W. Houston, counsel for United Mine Workers, of Charleston, will institute proceedings to have them liberated under a writ of habeas corpus.

Although Keeney professed ignorance of the plans of the uprising, when arraigned before Judge Bland, the prosecuting attorney of Logan County cited a speech Keeney made at Fairmont prior to the uprising in which the union official specifically spoke of the large number of men under arms in Kanawha County.

Maryland Commission Prepares a Mine Law

A SPECIAL commission has been appointed by the Governor of Maryland to revise the mining laws of that state. This commission is composed of William Milnes Maloy, G. Marshall Gilette and William J. Trickett. It has prepared a bill of 23 chapters and 167 sections which has been submitted to operators and miners for amendment and criticism. It has been suggested that miners consider the bill at local meetings and make any suggestions or amendments which may be deemed pertinent. Among other things the bill provides that wherever miners are paid by weight, operators shall install and maintain suitable and accurate scales. Under the terms of the bill mining companies will also be required to furnish first-aid equipment and keep it in a convenient place about the mines.

AS WE UNDERSTAND the tangled Far Eastern question, American business wishes to bring orders out of chaos.—*Tremont Tribune.*

Wage Reduction Ordered by Arbitrator in Tennessee-Southeastern Kentucky Field

On Dec. 20 D. Stewart Miller, referee of the permanent arbitration board of the southeastern Kentucky and eastern Tennessee field, rendered a decision as to the wage to be paid hereafter in that field. It may be well to review some of the history of earlier negotiations. Prior to November, 1917, when an agreement was made at Washington, the operators and mine workers had signed no contract and there had been no organization in the district for fifteen years. The April, 1920, contract which followed was entered into by this field at Knoxville, Tenn., and was in a sense an open-shop agreement. It did not provide for the "check-off."

That agreement also provided that "unless authorized by the arbitration board to meet an extraordinary or unusual condition or otherwise provided herein, no operation is permitted to pay any other wage than that specified in the agreement." The board, having been asked to provide a decrease in wage owing to the unfortunate condition of the industry, failed to come to a conclusion, but when the matter was submitted to the referee he decided that the condition was extraordinary and unusual, orders for at least five million tons of railroad coal alone having been lost to the non-union fields of Alabama, West Virginia, Virginia, and to the Hazard field of Kentucky. The Southern Railroad Co. has transferred orders totaling 65,000 tons per month, or roughly, 750,000 tons a year, from the mines of the Tennessee-southeastern Kentucky region to the non-union mines along the Clinchfield road. The contracts signed are for five years. The Louisville & Nashville R.R., which bought its coal from Mingo Hollow mines for many years and continued to do so until last July, has now transferred this business to the Hazard field, where during the last few months wages have been reduced more than once. The referee further says that thirty mines in the region are already on the 1917 scale.

His decision is: That the various mining rates in effect Nov. 30, 1921, at the respective mines shall be reduced 20 per cent; that the charge for smithing shall be lowered from $1 to 50c. and that the following shall be the scale of wages for day labor in and around the mines:

Machine runners	$4.40
Motormen, blacksmiths and drum men	4.00
Engineers, carpenters, spike-team and boss drivers, head trackmen, head timbermen and bratticemen	3.84
Blacksmith's and carpenter's helpers	3.60
Machine runners and timbermen's helpers, couplers, single drivers, track helpers, wiremen, pipe men and pumpers	3.44
Unclassified inside labor, tippers and trimmers	3.20
Firemen	3.04
Teamsters and inexperienced coal loaders	2.80
Unclassified outside labor	2.72
Sandmen, greasers and yard couplers	2.64
Trappers and boys	2.00

He also rules that house rent must be reduced 50c. per room per month; that house coal be furnished at the respective mines in the same manner and at the same price as was ruling during the month of March, 1920; that companies shall reduce to the limit of their ability the price of merchandise in their stores; that in all other respects the Knoxville agreement shall during its life continue in full force and that the award shall be retroactive and date from Dec. 1.

Third Hearing of Coronado Coal Case by Supreme Court Set for Feb. 27

For the third time the case of the Coronado Coal Co. against the United Mine Workers of America, for treble damages under the Sherman law for destruction of its property during a strike, will be argued before the U. S. Supreme Court before a decision is rendered. The case already has been argued twice but before a decision was handed down there was a change in the personnel of the court, and now the court has ordered a third argument, which will be made on Feb. 27. Since the argument of the case at the last term Chief Justice White has died. Chief Justice Taft, his successor, was not present at the argument, and had there been a divided bench, 4 to 4 on the case, Mr. Taft could not have participated in the decision as he took no part in its consideration during the argument. As the invariable rule of the court requires argument before a complete court in important cases, Chief Justice Taft has ordered the case re-argued.

The case is of vital importance to the coal industry as it involves the question of whether labor unions are immune from prosecution and damages resulting from destruction of property during a strike. The coal company obtained a verdict in the lower court, which awarded it treble damages under the anti-trust law. This the mine union seeks to set aside on the ground that labor unions are not an entity at law subject to suit and from whom damages may be recovered. The case has been pending in the Supreme Court for several years and because of its vital importance the court has proceeded with the greatest deliberation in the various stages of its litigation.

Union Calls off Conference on New Wage Scale of Central Competitive Region

Owing to the unwillingness of the Pittsburgh and Ohio operators to attend a conference called by President John L. Lewis for last Friday, Jan. 6, at the William Penn Hotel, Pittsburgh, Pa., the meeting was cancelled Jan. 4 by Mr. Lewis himself. Mr. Lewis has issued this statement:

"Representatives of the mine workers will hold themselves in readiness to take part in such a meeting whenever it becomes possible for them to do so.

"Aside from the natural obligation to carry out the provisions of an agreement by which they are bound it is essential from a standpoint of public interest that a joint meeting of operators and miners be held.

"In no other way can the problems of the coal industry be solved, and in due time circumstances will compel such a meeting.

"It would be futile to convene such a meeting without adequate representation of the operating interests in the Central Competitive field, and this office has therefore been reluctantly compelled today to notify interested parties that the proposed joint meeting has been cancelled.

"It may be considered unfortunate that the substantial groups of operators in the Central Competitive field have seemingly forgotten or ignored their obligations under the provisions of the joint wage agreement."

The United Mine Workers of America believe that the operators of Illinois and Indiana are so greatly in favor of a renewal of the Central Competitive contract that they will bring pressure to bear on the other groups to enter into a conference with the union.

To Argue Constitutionality of Kansas Court

Argument on the constitutionality of the Kansas Court of Industrial Relations will be heard by the U. S. Supreme Court on Feb. 27. At the same time arguments will be heard on appeals of Kansas labor leaders from prison sentences imposed under the law for violation of anti-strike orders in the coal fields.

The hands of the Federal Trade Commission have been materially strengthened by the decision of the Supreme Court last week in the case of the Beechnut Packing Co., wherein the court upheld the right of the commission to determine in each case what constituted unfair methods of competition in trade, subject to court review, in the absence of specific definition by Congress of what constitutes unfair competition. In the Beechnut case the court sustained the complaint of the commission that restrictions on resale prices constituted a hindrance of competition and the creation of monopoly.

The staff which is to conduct the study of intermittency in the bituminous coal industry has not been nominated at this writing. It was Mr. Hoover's intention to nominate this staff during the week ended Jan. 7, but, due to the fact that E. E. Hunt, secretary of the unemployment conference, has been confined to his bed as a result of a fall on the ice, he has not been able to confer with Mr. Hoover, and the selection of the personnel which will conduct the investigation has been delayed.

Would Solve Coal Problem by Nationwide Unionization and Equalized Costs

UNIONIZATION of the non-union coal-mining fields and the equalization in cost of production between the different states is the only possible solution of the coal industry problem, according to a statement issued recently by Philip H. Penna, secretary of the Indiana Bituminous Coal Operators' Association. Government intervention, he declared, appeared to be the only method of preventing a long period of idleness in the Central Competitive Field after April 1.

Mr. Penna said that since operators of western Pennsylvania and southern Ohio have declined to attend a conference looking to preparation of a new contract with the United Mine Workers, it would be futile to hold such a meeting as provided for of operators of the four states of the Central Competitive Field. Limited production in Indiana, he said, was a direct result of the market being supplied from lower-cost production mines in the non-union fields of West Virginia and Kentucky.

"The contract made by the coal operators and miners of the Central Competitive district in 1920 and effective until March 31, 1922," said Mr. Penna, "was made by the order and under the direction of the President of the United States and approved by the Attorney General, and contains the following provisions, in part:

"'An interstate joint conference shall be held prior to April 1, 1922, the time and place of holding such conference to be determined by a committee of two operators and two miners from each of the four states: Illinois, Indiana, Ohio and western Pennsylvania.'

"There is but one solution to this problem, and that is an equalization in cost of production as between the respective states. The non-union fields must be unionized and obtain wages and conditions better than they have, or the union miners of Indiana and the Central Competitive district must accept less wages. I judge that the operators of the districts which are refusing to go into the interstate joint conference are influenced by the inflexible attitude of the United Mine Workers as shown by their refusal to modify existing agreements in the union fields and their inability to prevent such modifications in the non-union fields."

Men at Brooke County Mine in Panhandle Voluntarily Accept Wage Reduction

WHEN 200 miners resumed work at the Colliers plant of the West Virginia-Pittsburgh Coal Co. in Brooke County, West Virginia, at a reduced wage, it signalized the first break from the union in the northern Panhandle. The men returned to work on the morning of Dec. 30, accepting a 20-per cent reduction in negotiations with the company to which the United Mines Workers was not a party and which were held without regard to that organization. There were some of the miners, however, who declined to accept the reduction. The minimum rate to be paid under the new agreement will be $28 per week. There are two other plants of the same company still in idleness, but if the miners at such plants accept a reduction, operations will be resumed at those plants also. All of the company's plants were closed down several weeks ago when the company found it could not sell coal in competition with non-union producers at wages then paid under union agreement.

Unemployment Increased 4.7 Per Cent in 65 Cities During December

UNEMPLOYMENT throughout the country increased by 4.7 per cent during December, according to the telegraphic survey made monthly by the U. S. Employment Service. The survey covered 1,428 firms located in the 65 principal industrial centers of the country. These concerns were employing 1,493,107 workers on Dec. 31.

Increased employment is shown in textiles, iron and steel, lumber, leather, paper and printing and metals and metal products other than iron and steel. The decreases were mainly in the food industries; liquors and beverages; chemicals; stone, clay and glass products; tobacco manufacture; vehicles for land transportation and railroad repair shops.

Of the 65 cities covered by the survey, 29 report employment increases during December over November, with percentages of increase as follows: Philadelphia, 6 per cent; Milwaukee, 5.8; Dayton, 4.9; Los Angeles, 4.8; Toledo, 4.7; Paterson, 3.7; New Haven, 3.1; Albany-Schenectady, 2.9; Columbus, 2.5; Fall River, 2.4; Niagara Falls, 2.4; Reading, 2.3; Indianapolis, 1.9; Rochester, 1.8; Worcester, 1.7; Chattanooga, 1.6; New Orleans, 1.5; Lowell, 1.5; New York, 1.5; Lawrence, 1.4 Youngstown, 1.3; Manchester, N. H., 1.1; Cincinnati, 0.68; Bayonne, 0.6; Boston, 0.54; Providence, 0.45; Yonkers, 0.37; Birmingham, 0.3; New Bedford, 0.26.

Thirty-six cities reported employment decreases in the following percentages: Detroit, 47.6 per cent; Omaha, 21.2; Peoria, 17.6; Johnstown, 17.3; Sioux City, 15.6; Seattle, 12; Syracuse, 11; Grand Rapids, 10.7; Memphis, 10.5; Baltimore, 10.5; Minneapolis, 9.6; Portland, 6.9; St. Paul, 6.6; Buffalo, 6.1; St. Louis, 6; San Francisco, 5.8; Atlanta, 5.7; Perth Amboy, 4.9; Camden, 4.7; Jersey City, 4.6; Cleveland, 3.8; Waterbury, 3.7; Richmond, 3; Chicago, 2.7; Passaic, 2.5; Pittsburgh, 2; Kansas City, 2; Kansas City, Kan., 1.6; Louisville, 1.4; Denver, 1; Newark, 0.98; Trenton, 0.87; Flint, 0.8; Brockton, 0.4; Bridgeport, 0.3; Springfield, Mass., 0.12.

British Empire Steel Corporation Ordered By Court to Suspend Its Wage Cut

NEGOTIATIONS with the miners in their employ for a readjustment of wages having failed, the British Empire Steel Corporation announced a reduction of wages amounting to about 33 per cent for Jan. 1. The miners, requested by the officials of District 26 of the United Mine Workers, asked the federal Department of Labor to appoint a Board of Conciliation and also petitioned the Supreme Court for an injunction to prevent any cut in wages pending an investigation by the board. On Dec. 31 Judge Russell granted the injunction restraining the Dominion Coal Co., the Nova Scotia Steel & Coal Co. and the Acadia Coal Co., subsidiaries of the British Empire Steel Corporation, from putting the reduction of wages into effect until the matter has been dealt with by the Board of Conciliation. The British Empire Steel Corporation has issued a statement declaring that owing to the action of the court a reduction in the selling price of coal is necessarily deferred, and that general idleness at the Nova Scotia collieries may result.

WALTER E. TRENT HAS SUBMITTED a bid for four of the Shipping Board's large sea-going barges which are to be sold in the near future. Mr. Trent intends to use these barges between Norfolk and his Alexandria (Va.) plant. Coal which has been treated by the Trent process can be sold to greater advantage, it is believed, in Latin America than in the United States. It is Mr. Trent's intention to ship his product to the seaboard by way of the Potomac and to load the barges on the return trip with fuel oil, one of his raw materials. The Shipping Board has purchased six hundred tons of Mr. Trent's "amalgam" and will conduct experiments in its use as a boiler fuel aboard ship.

OFFICIAL NOTICE HAS BEEN GIVEN by the railroads declining to put into effect reduced rates on coal to tidewater. This marks the end of a very earnest effort made by the committee, headed by W. V. Hardie, director of traffic of the Interstate Commerce Commission, to bring about a voluntary reduction of export rates as a contribution to the movement looking to the retention of our foreign coal trade.

C. W. STARR HAS BEEN SELECTED by W. D. Brookings, head of the natural resources section of the Chamber of Commerce of the United States, as coal specialist.

THE EXISTING VACANCY on the Finance Committee—the premier committee of the Senate—is likely to be filled by the appointment of Senator Frelinghuysen of New Jersey to that committee.

Production and the Market

Weekly Review

ENCOURAGING signs of improvement have followed the holidays and the dull period which ushered out the old year. Industrials are proceeding cautiously, but consumption is increasing after the holiday dip. Consumers are feeling around for indications upon which to gage their purchases in the first quarter. Inquiries for future delivery are increasing daily, but closings are few, as neither buyer nor seller is inclined to use the present market as a basis upon which to do future business.

Close sales prevail in the spot market and the removal of the freight tax has given the shippers more leeway. Reserves are still adequate, but the buyer is not so inclined to use them for his current needs. The wage controversy is daily being brought to his attention, with the result that requirements are more and more being supplied through spot orders, and the feeling is growing that a cautious policy forbids a further depletion of storage between now and April 1.

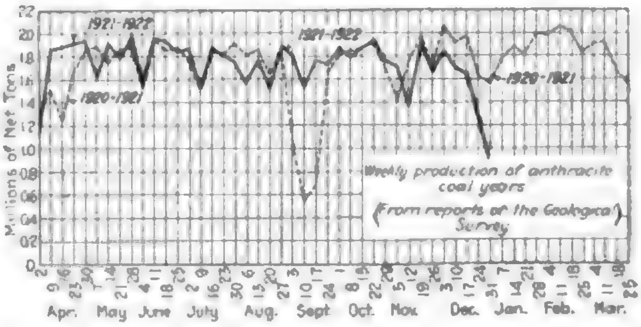
Coal Age Index stood at 83 on Jan. 9, as compared with 84 on Jan. 2.

Retail distribution has been aided by the colder weather, although household orders are still being held down to current needs. Prices have softened a trifle because of the lower mine quotations and removal of the freight tax. The result is a slightly increased ordering for yard replacement, which promptly checked the advancing fine-coal market, showing how sensitive has been the balance of steam supply and demand.

Liquidation of labor has progressed further this month. The unionized miners seem to have fallen into two classes—those who, because of their poor earnings, are just "plain dissatisfied" with conditions but who evince no willingness to sacrifice the "paper profits" of a higher wage scale, and those who have, or are seeking, a return to better working time on a lower wage basis permitting tonnage to enter the market at the prevailing prices. Progress was made last week in the upper Potomac and Colorado regions toward union wage scale reductions. The men are reported to have broached the subject to their employers.

Colder weather has aided the anthracite industry, although the market is quieter than in recent seasons. Independents are still forced to forego a large portion of their premiums on domestic coal or else remain closed, as retail stocks are too heavy to necessitate much buying of coal at prices higher than company schedule.

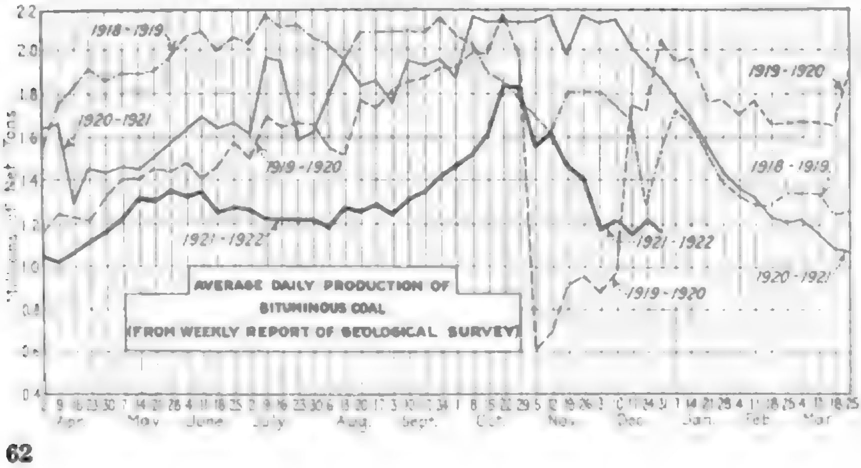
Operating conditions have been aided, as in the bituminous coal industry, by retail price cuts following the removal of the transportation tax on Jan. 1. Steam coals also are in better call.



There have been some first-quarter coke contracts closed and prices have been shaded a trifle. The necessary contracting probably is all completed at this time, leaving some operators with tonnage on their hands which they would be glad to tie up for less than going contract figures.

BITUMINOUS

Production during the last week of 1921 was 5,960,000 net tons, as compared with 7,063,000 and 7,450,000 tons for the weeks of Dec. 17 and 24, respectively. The output was held down by the holiday idleness, but the daily average—1,192,000 tons—showed no recovery in demand. The first week of the new year showed that Monday, Jan. 2, was widely observed as a holiday, as loadings on that



AVERAGE DAILY PRODUCTION OF BITUMINOUS COAL
(FROM WEEKLY REPORT OF GEOLOGICAL SURVEY)

Estimates of Production

(Net Tons)

BITUMINOUS COAL		
Week Ended	1921	1920
Dec. 17	7,066,000	12,156,000
Dec. 24	7,468,000	9,686,000
Dec. 31 (a)	5,960,000	....
Daily average	1,192,000	....
Calendar year (a)	406,990,000	556,516,000
Daily average calendar year	1,326,000	1,805,000
ANTHRACITE		
Dec. 17	1,664,000	1,998,000
Dec. 24	1,338,000	1,641,000
Dec. 31 (a)	862,000	1,597,000
Calendar year	87,695,000	88,845,000
COKE		
Dec. 24 (b)	117,000	272,000
Dec. 31 (a)	104,000	278,000
Calendar year	5,507,000	20,980,000

(a) Subject to revision (b) Revised from last report.

day were only one-sixth of normal. However, 27,080 cars were loaded on the following day, the heaviest since Nov. 23, 1921.

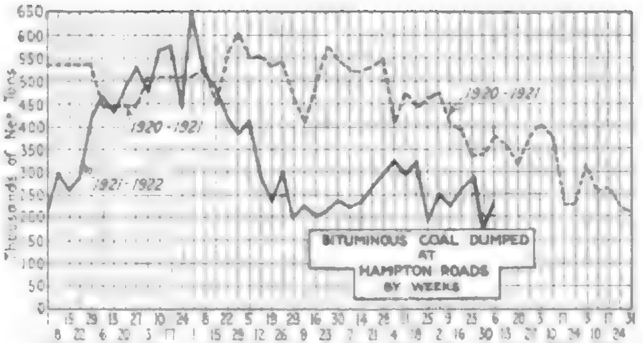
The year's production of bituminous coal is estimated at 406,990,000 tons, the lowest since 1911, when 406,000,000 tons were mined. Records of railroad loadings for November, 1921, show that 36,020,000 net tons were mined, as compared with 43,733,000 tons in October and 35,127,000 tons in September. Cumulative production to Nov. 30, 1921, was 376,000,000 tons.

PRODUCTION OF SOFT COAL, BY GROUPS OF STATES, 1919—1921

(In Net Tons)

Region	First 11 Months of 1921	Year 1921 at Same Rate as 1st 11 Mos.	1920	1919
Northeast (a)	223,522,000	241,896,000	331,510,000	300,420,275
Southern Appalachnia (b)	15,728,000	17,020,000	23,500,000	20,803,263
Eastern Interior (c)	91,210,000	98,707,000	130,800,000	90,407,132
Western Interior (d)	17,970,000	19,447,000	29,930,000	21,741,003
Mountain States and Northwest (e)	27,622,000	29,893,000	40,680,000	32,381,012
Totals (f)	376,052,000	406,963,000	556,420,000	465,752,685

(a) Michigan, Pennsylvania, Ohio, West Virginia, Maryland, Eastern Kentucky and Virginia. (b) Alabama, Georgia and Tennessee. (c) Illinois, Indiana and Western Kentucky. (d) Iowa, Kansas, Missouri, Oklahoma, Arkansas and Texas. (e) Colorado, New Mexico, Utah, Wyoming, Montana, North Dakota and Washington. (f) Alaska, California, Idaho North Carolina, Oregon and South Dakota not included.



Domestic output was heavier last week, following a few days of colder weather, and the resultant production of steam sizes soon caught up with the demand. Screenings are now weaker all around, although this size is moved with no real difficulty. The retailer is buying to replenish the slight drain on his yard stocks, but instead of placing an order for several cars weekly, as was the custom in normal years, he buys each car individually, with closer attention to price rather than quality.

This is especially true of the Midwest, where better

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

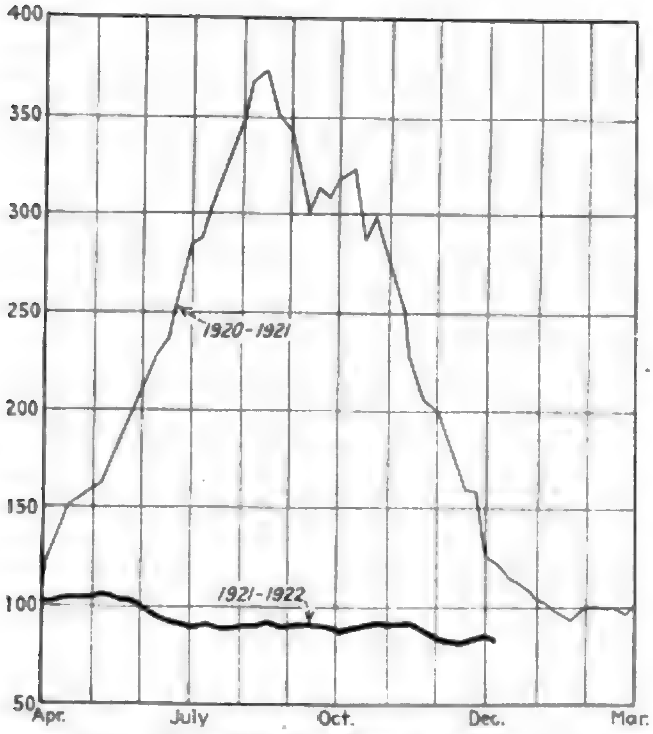
Low-Volatile, Eastern	Market Quoted	Dec. 12 1921	Dec. 26 1921	Jan. 2 1922	Jan. 9 1922†
Pocahontas lump	Columbus	$3.60	$3.55	$3.55	*$3.25@$3.50*
Pocahontas mine run	Columbus	2.20	2.15	2.15	2.00@ 2.25
Pocahontas screenings	Columbus	1.65	1.65	1.65	*1.35@ 1.65*
Pocahontas lump	Chicago	3.10	3.10	3.10	2.50@ 3.75
Pocahontas mine run	Chicago	2.25	2.40	2.50	2.00@ 3.00
Pocahontas lump	Cincinnati	3.25	3.25	3.25	*2.75@ 3.25*
Pocahontas mine run	Cincinnati	2.25	2.10	2.05	*1.85@ 2.00*
Pocahontas screenings	Cincinnati	1.40	1.65	1.55	*1.25*
*Smokeless mine run	Boston	4.80	4.55	4.70	4.60@ 4.75
Clearfield mine run	Boston	1.80	2.05	2.05	1.80@ 2.35
Cambria mine run	Boston	2.35	2.10	2.50	2.25@ 2.70
Somerset mine run	Boston	1.85	1.80	1.80	1.60@ 2.00
Pool 1 (Navy Standard)	New York	3.00	3.05	3.15	2.90@ 3.40
Pool 1 (Navy Standard)	Philadelphia	3.00	3.00	3.00	2.75@ 3.25
Pool 1 (Navy Standard)	Baltimore	2.30	2.35	2.40	**2.50**
Pool 9 (Super. Low Vol.)	New York	2.40	2.30	2.35	*2.10@ 2.25*
Pool 9 (Super. Low Vol.)	Philadelphia	2.35	2.30	2.30	2.10@ 2.50
Pool 9 (Super. Low Vol.)	Baltimore	2.10	2.20	2.20	*2.00@ 2.25*
Pool 10 (H. Gr. Low Vol.)	New York	2.05	2.00	2.10	*1.80@ 2.00*
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.05	2.00	2.00	1.90@ 2.10
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.00	2.00	2.00	*1.85@ 2.00*
Pool 11 (Low Vol.)	New York	1.80	1.75	1.65	**1.80@ 1.90**
Pool 11 (Low Vol.)	Philadelphia	1.85	1.70	1.70	1.60@ 1.80
Pool 11 (Low Vol.)	Baltimore	1.75	1.85	1.75	1.75
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.55	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)	Philadelphia	1.70	1.55	1.55	1.45@ 1.70
Pool 54-64 (Gas and St.)	Baltimore	1.45	1.40	1.45	*1.25@ 1.60*
Pittsburgh Sc'd. gas	Pittsburgh	2.70	2.65	2.65	2.60@ 2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@ 2.20
Pittsburgh slack (Gas)	Pittsburgh	1.55	1.65	1.80	1.75@ 1.85
Kanawha lump	Columbus	2.90	2.85	2.80	2.65@ 3.00
Kanawha mine run	Columbus	1.85	1.90	1.85	*1.60@ 1.90*
Kanawha screenings	Columbus	1.00	1.15	1.40	*1.20@ 1.35*
Kanawha lump	Cincinnati	2.50	2.90	2.75	*2.35@ 2.50*
Kanawha mine run	Cincinnati	1.50	1.30	1.45	*1.25@ 1.35*
Kanawha screenings	Cincinnati	1.15	1.15	1.25	1.25
Hocking lump	Columbus	3.05	3.05	3.00	*2.75@ 3.00*
Hocking mine run	Columbus	1.95	1.95	1.90	*1.65@ 1.90*
Hocking screenings	Columbus	$1.15	$1.20	$1.40	**$1.35@$1.55**
Pitts. No. 8 lump	Cleveland	3.15	3.00	3.05	*2.75@ 3.00*
Pitts. No. 8 mine run	Cleveland	2.05	1.95	2.00	1.95@ 2.10
Pitts. No. 8 screenings	Cleveland	1.55	1.70	1.95	*1.85@ 1.95*
Midwest					
Franklin, Ill. lump	Chicago	3.80	3.65	3.80	3.50@ 4.05
Franklin, Ill. mine run	Chicago	2.75	2.90	2.90	2.75@ 3.00
Franklin, Ill. screenings	Chicago	1.80	2.10	2.10	*1.75@ 2.25*
Central, Ill. lump	Chicago	3.35	3.10	3.10	2.75@ 3.50
Central, Ill. mine run	Chicago	2.10	2.50	2.50	2.25@ 2.75
Central, Ill. screenings	Chicago	1.70	2.00	1.90	*1.85@ 2.00*
Ind. 4th Vein lump	Chicago	3.35	3.35	3.35	3.00@ 3.75
Ind. 4th Vein mine run	Chicago	2.75	2.70	2.55	2.40@ 2.75
Ind. 4th Vein screenings	Chicago	1.90	1.75	2.10	1.90@ 2.25
Ind. 5th Vein lump	Chicago	2.80	2.95	2.95	2.60@ 3.25
Ind. 5th Vein mine run	Chicago	2.45	2.45	2.15	2.15@ 2.40
Ind. 5th Vein screenings	Chicago	1.55	1.80	1.80	*1.50@ 1.85*
Standard lump	St. Louis	2.80	2.80	2.60	2.50@ 2.75
Standard mine run	St. Louis	1.95	1.90	1.85	1.80@ 1.90
Standard screenings	St. Louis	1.25	1.40	1.65	*1.35@ 1.60*
West. Ky. lump	Louisville	2.75	2.75	2.85	2.75@ 3.00
West. Ky. mine run	Louisville	1.75	1.75	1.90	1.50@ 2.25
West Ky. screenings	Louisville	1.05	1.85	1.65	*1.00@ 1.50*
South and Southwest					
Big Seam lump	Birmingham	3.65	3.65	3.35	2.75@ 4.00
Big Seam mine run	Birmingham	2.00	2.10	2.10	1.90@ 2.30
Big Seam (washed)	Birmingham	2.30	2.15	2.15	2.00@ 2.30
S. E. Ky. lump	Louisville	3.15	2.85	2.85	**3.00@ 3.25**
S. E. Ky. mine run	Louisville	1.75	1.50	1.60	**1.65@ 1.70**
S. E. Ky. screenings	Louisville	1.00	1.45	1.30	**1.25@ 1.45**
S. E. Ky. lump	Cincinnati	3.15	3.15	3.00	*2.75@ 3.00*
S. E. Ky. mine run	Cincinnati	1.55	1.30	1.50	*1.25@ 1.60*
S. E. Ky. screenings	Cincinnati	0.95	1.25	1.20	**1.00@ 1.50**
Kansas lump	Kansas City	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City	4.10	4.10	4.10	4.00@ 4.25
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Dec. 26, 1921 Independent	Dec. 26, 1921 Company	Jan. 2, 1922† Independent	Jan. 2, 1922† Company	Jan. 9, 1922† Independent	Jan. 9, 1922† Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.50@$7.75	7.75@ 7.85	$6.75@$7.50	7.75@ 7.85	$6.75@$7.50	7.75@ 7.85
Egg	New York	2.61	7.00@ 7.25	7.60@ 7.75	6.50@ 7.00	7.60@ 7.75	**7.25@ 7.50**	7.60@ 7.75
Egg	Philadelphia	2.66	7.00@ 7.25	7.75@ 7.85	7.00@ 7.75	7.75@ 7.85	7.00@ 7.75	*7.75*
Egg	Chicago	5.63	7.40*	6.95*	7.40*	6.95*	7.40*	6.95*
Stove	New York	2.61	8.00@ 8.25	7.90@ 8.10	7.85@ 7.25	7.90@ 8.10	7.85@ 8.25	7.90@ 8.10
Stove	Philadelphia	2.66	8.25@ 8.50	8.05@ 8.25	8.25@ 8.50	8.05@ 8.25	*8.10@ 8.35*	8.05@ 8.25
Stove	Chicago	5.63	7.60*	7.20*	7.60*	7.20*	7.60*	7.20*
Chestnut	New York	2.61	8.00@ 8.25	7.90@ 8.10	7.85@ 8.25	7.90@ 8.10	7.85@ 8.25	7.90@ 8.10
Chestnut	Philadelphia	2.66	8.25@ 8.75	8.05@ 8.25	8.25@ 8.50	8.05@ 8.25	*8.10@ 8.35*	8.05@ 8.25
Chestnut	Chicago	5.63	7.60*	7.20*	7.60*	7.20*	7.60*	7.20*
Pea	New York	2.47	4.50@ 5.00	6.05@ 6.45	4.00@ 5.00	6.05@ 6.45	**4.25@ 5.00**	6.05@ 6.45
Pea	Philadelphia	2.38	4.50@ 5.00	6.15@ 6.25	4.25@ 5.00	6.15@ 6.25	**4.50@ 5.00**	6.15@ 6.25
Pea	Chicago	5.63	6.10*	5.60*	6.10*	5.60*	6.10*	5.60*
Buckwheat No. 1	New York	2.47	2.25@ 2.75	3.50	2.00@ 2.75	3.50	**2.50@ 3.00**	3.50
Buckwheat No. 1	Philadelphia	2.38	2.25@ 3.00	3.50	2.25@ 2.75	3.50	2.25@ 2.75	3.50
Rice	New York	2.47	1.60@ 2.00	2.50	1.50@ 2.25	2.50	**1.75@ 2.25**	2.50
Rice	Philadelphia	2.38	1.75@ 2.00	2.50	1.75@ 2.00	2.50	1.75@ 2.00	2.50
Barley	New York	2.47	1.00@ 1.50	1.50	1.35@ 1.50	1.50	1.35@ 1.50	1.50
Barley	Philadelphia	2.38	1.00@ 1.25	1.50	1.00@ 1.25	1.50	1.00@ 1.25	1.50
Birdseye	New York	2.47	....	2.50	....	2.50	....	2.50

*Net tons, f.o.b. mines.
†Advances over previous week shown in **heavy type**, declines in *italics*.



COAL AGE INDEX 83, WEEK OF JAN. 9, 1922

This diagram shows weekly changes in the spot prices of bituminous coal in the United States as a whole. All prices are reduced to one figure and compared with the average government price of 1918, taken as 100. Actual spot prices for each coal are given in the table in this review.

household buying is noted. The Kansas City market, however, is glutted with Illinois domestic coal, which is being sacrificed to get it off the tracks. The Cincinnati gateway is again becoming clogged with cars on consignment. One reason for this is the heavier operation of southeastern Kentucky mines on the reduced wage scale, and these wrong operating tactics have softened the market in that vicinity.

Prices of coal on the Head-of-the-Lakes docks have been slashed an even dollar to stimulate the movement to the interior. While this has had some effect, the main result was the setback to all-rail competition in the Northwest. Some of the Iron Range mines are showing signs of activity and the seasonably cold weather has helped the domestic market, but steam conditions generally are in lamentable shape.

Business at the Roads has taken on a slightly firmer tone. Dumpings for all accounts were 237,806 net tons during the week ended Jan. 5, as compared with 175,517 tons the previous week. Accumulations at the piers are greatly reduced. Bunkering is more active following the increase in general shipping and last week saw several export cargoes cleared. The destinations, however, were confined to the West Indies and South American ports.

The New England situation is as quiet as ever. Market cargoes are still coming forward, but have been disposed of at slightly better figures. Hampton Roads coals are so low, however, that Pennsylvania grades are unsalable within 100 miles of Boston and all-rail business is now confined to small lots in the narrow zone that cannot be reached via Hampton Roads.

Conditions at Baltimore, New York and Philadelphia are slightly more encouraging. Receipts are small and prices more firmly held, while consumers are more active in seeking tonnage protection for the next 90 days. Actual orders have increased only a trifle.

The comparative ease with which non-union coals secure the bulk of the business that is available makes it more apparent that lower wage scales are vitally necessary to unionized operations. Indiana and Illinois operators have asked for an early conference with the United Mine Workers to discuss this question, while in other sections the question of individual discussions with the various district union officials is under consideration.

ANTHRACITE

The last week of the year saw many anthracite collieries closed and thousands of miners idle. Production was only 862,000 net tons, barely one-half the figure for the corresponding week a year ago. Production after the holidays showed an upturn, following the colder weather.

Domestic demand is rather slow in New England except for the popular sizes. New York and Philadelphia report satisfactory increases in activity and lower retail prices following the removal of the transportation tax. Steam sizes are moving better.

COKE

Beehive coke production was 104,000 net tons during the week ended Dec. 31. The decline of 13,000 tons from the preceding week's figure was caused by the holidays rather than any further slump in demand.

Interest in the coke market centered around the closings for the first quarter, prices on which softened a trifle. One byproduct contract was closed at a very low figure, which hurt the Connellsville market. This low figure was not on account of beehive competition but to enable the furnace to blow in. The seller loses on the coke but gains in the make of byproducts and has the privilege of withdrawing the tonnage should he need it for his own furnaces.

Foreign Market And Export News

Russia Owes Shipping Board for Coal

The Senate Judiciary Committee has published correspondence relating to loans to foreign countries by the United States, in which reference is made to coal. In requesting a loan of $48,000,000 the Greek Minister pointed out that Greece depends on the United States for coal.

A statement was given showing that Russia owed the Shipping Board the following amounts for coal: coal on delivery June 21, 1917, $1,040; coal on delivery to Publishers Paper Co., Nov. 22, 1917, $4,455; coal consumed by vessel during off-hire, $1,375; coal on delivery June 20, 1917, to June 15, 1918, $1,034; coal on re-delivery, $4,620; coal on delivery May 26, 1917, to Jan. 23, 1918, $2,607; coal on re-delivery, $3,608; coal on delivery July 7, 1917 to March 9, 1918, $1,386; coal on re-delivery and off-hire, $2,563; coal on board on delivery July 28, 1917, to May 28, 1918, $1,639; coal on re-delivery and off-hire, $1,996; coal on re-delivery May 7, 1917, to Feb. 7, 1918, $594.

Coal Paragraphs from Foreign Lands

CHILE—A corporation has been organized in Valparaiso, called the Compania Minera e Industrial de Chile, as stated by *Commerce Reports*. It is expected that the capital will be raised to 500,000,000 paper pesos, with which the entire property of the Lota & Coronel Coal Co., the largest of its kind in Chile, will be acquired. Directors and stockholders of the new company are practically the same as those of the Lota and of the Schwager Coal companies. If this plan is accomplished it will result in almost complete control of the coal industry in Chile.

ITALY—The price of Cardiff steam firsts is quoted at 38s. 3d. on the Genoa market, acording to a cable to COAL AGE. On Jan. 1, the price was 38s.

EGYPT—For the nine months ended Sept. 30, 1921, coal imports were 698,028 tons, of which 362,583 tons came from the United States and 213,335 from the United Kingdom. The position enjoyed by the American shippers, however, has been reversed by the reentry of British competition, following the approach to normal of that industry.

British Railways Cut Rates to Help Coal Trade

Reduction, 25 Per Cent, Not Thought Sufficient to Restore Competition—Production Registers Slight Decline—Prices Show Marked Decline from a Year Ago

BRITISH production for the week ended Dec. 24 was 4,965,000 gross tons, according to a cable to COAL AGE. This is a slight decline from the preceding week's figure, when 5,027,000 tons were mined. Export markets are not quite so active but severe weather is hampering loadings, increasing congestion.

English and Welsh railway companies on Jan. 1 reduced carrying charges for coal, iron, steel and limestone for iron and steel works. Though the concessions are not as large as those asked, the reduction in railway revenue will be around £10,000,000 per year.

The 1921 rate for carrying coal, coke and patent fuel was the January, 1914, basis plus 100 per cent. This was cut to 75 per cent and is to be applied experimentally for twelve months.

The feeling in the South Wales coal trade is that the present charges can afford no marked assistance to the competitive position of the industry and that reduction of dock dues and a return to the three-shift working of coal trimmers and tippers remain the essentials for the restoration of the export trade.

The railways are aware that these reductions are less than those which were stated to be necessary in order to afford the desired relief to trade, but, on the other hand, they cannot afford to make further concessions. Before such concessions are made there must be a fall in the price of coal and other materials and railway wages, and working conditions should be brought into more harmony with the industrial position.

The average price of steam coal in November was 25s. per ton, against 115s. in November, 1920. Household coal was 34.5s., against 37.5s., and bunkers 16s. compared with 74s. Gas coal in November was 22.85s., against 96.65s in the same month of 1920. Since January, 1921, the price of coal has been reduced by an average of 13s. 6d.

Large steam coal exported from Cardiff during November was 30s. 11d. against 32s. 8d. in October, steam smalls were 17s. 2d. against 16s. 8d.; large steam from Swansea was 28s. 10d. against 36s. 11d., and smalls remained the same at 16s. 7d.

Best Admiralty large coal is softer at 24s. 9d. Other quotations, cabled to COAL AGE show a lower range.

Return Cargoes of Ore May Revive French Market for American Coal

The possibilities of French iron ore coming to this country in return for American cargoes of coal have been put forward by a French concern with an output of 350,000 tons of ore a year. The company consumes about 250,000 tons of coal a year, and, in 1920, imported some American coal that gave excellent results, equaling the best English and Welsh product and proving superior to the German coal. American fuel, however, cannot be imported now on account of cost of transportation.

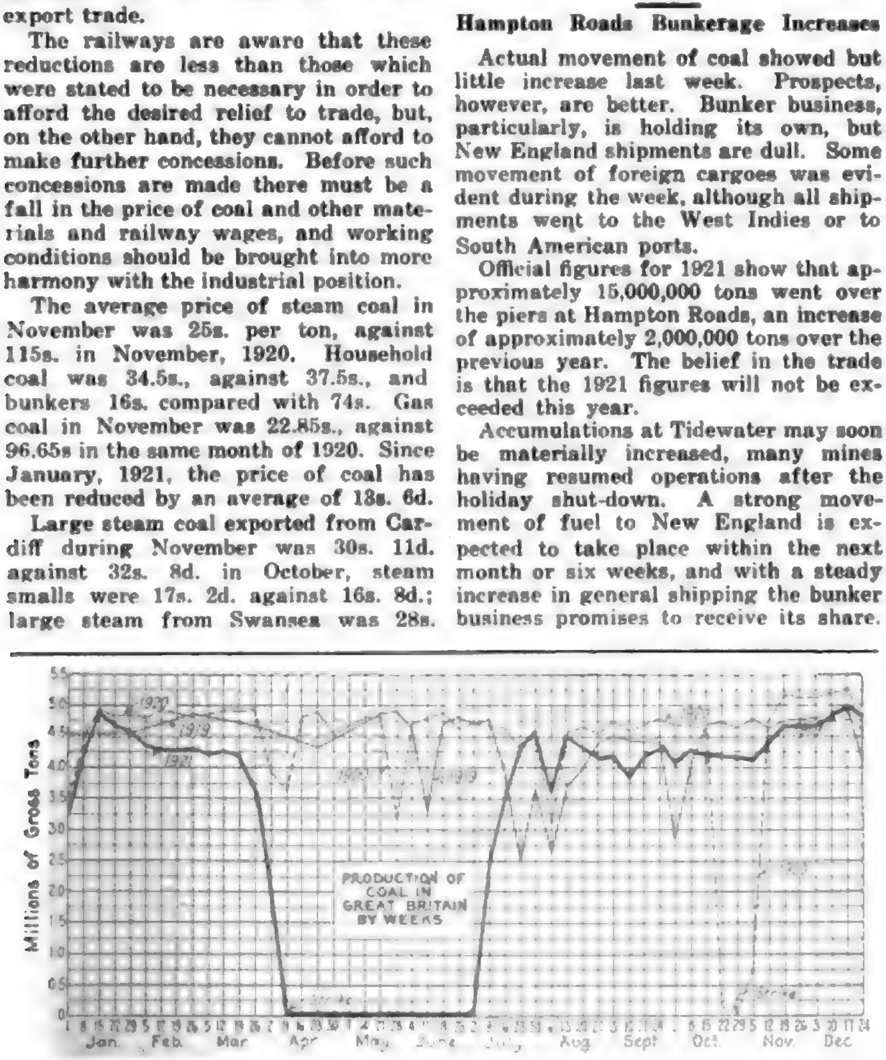
American coal, c.i.f. St. Nazaire, where the company is located, is at present about 135 fr., while English coal can be landed for 85fr.@90fr. If return cargoes were found for American vessels, however, the transportation charges could be reduced so as to enable American exporters to compete.

Hampton Roads Bunkerage Increases

Actual movement of coal showed but little increase last week. Prospects, however, are better. Bunker business, particularly, is holding its own, but New England shipments are dull. Some movement of foreign cargoes was evident during the week, although all shipments went to the West Indies or to South American ports.

Official figures for 1921 show that approximately 15,000,000 tons went over the piers at Hampton Roads, an increase of approximately 2,000,000 tons over the previous year. The belief in the trade is that the 1921 figures will not be exceeded this year.

Accumulations at Tidewater may soon be materially increased, many mines having resumed operations after the holiday shut-down. A strong movement of fuel to New England is expected to take place within the next month or six weeks, and with a steady increase in general shipping the bunker business promises to receive its share.



Pier and Bunker Prices, Gross Tons

Foreign Bunker Quotations by Cable to Coal Age

PIERS

	Dec. 31.	Jan. 7†
Pool 9 New York	$5.40@$5.60	[illegible]
Pool 10, New York	5.10@ 5.30	**5.20@ 5.35**
Pool 9, Philadelphia	5.50	5.50
Pool 10, Philadelphia	5.00@ 5.40	**5.10@ 5.40**
Pool 71, Philadelphia	5.50@ 5.75	5.50@ 5.75
Pool 1, Hamp. Rds	4.50@ 4.70	**4.65@ 4.75**
Pools 5-6-7 Hamp. Rds	4.25	4.25
Pool 2, Hamp. Rds	4.50	**4.50@ 4.60**

BUNKERS

	Dec. 31.	Jan. 7†
Pool 9, New York	5.70@ 5.90	**[illegible]@ 5.95**
Pool 10, New York	5.40@ 5.60	**[illegible]@ 5.65**
Pool 9, Philadelphia	5.50@ 5.85	**[illegible]@ 5.85**
Pool 10, Philadelphia	5.35@ 5.50	**5.40@ 5.50**
Pool 1, Hamp. Rds	4.80	4.75@ 4.85
Pool 2, Hamp. Rds	4.60	**4.60@ 4.70**
Welsh, Gibraltar	40s. f.o.b.	40s. f.o.b.
Welsh, Rio de Janeiro	65s. f.o.b.	65s. f.o.b.
Welsh, Lisbon	45s. f.o.b.	45s. f.o.b.
Welsh, La Plata	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Marseilles	125 fr. f.o.b.	125 fr. f.o.b.
Welsh, Genoa	40s. t.i.b.	40s. t.i.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Malta	45s. f.o.b.	45s. f.o.b.
Welsh, St. Michaels	60s. t.i.b.	60s. t.i.b.
Welsh, Las Palmas	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Port Said	51s. 6d. f.o.b.	51s. 6d. f.o.b.
Belgian, Antwerp	40s. f.o.b.	*38s. 6d*
Alexandria	42s.	42s.
Bombay	38 rupees	38 rupees
Capetown	42s. 6d.	42s. 6d.

C.I.F. Prices, American Coal

(In Gross Tons)

	Dec. 31 Low Vol.	Dec. 31 High Vol.	Jan. 7† Low Vol.	Jan. 7† High Vol.
French Atlantic	$8.60	$8.80	*$8.55*	$8.80
West Italy	8.70	8.85	*8.60*	*8.75*
Scandinavia	....	....	8.85	8.95
Havana	6.50	6.75	....	....
The Plate	8.75		8.90	

These quotations are purely nominal and as far as can be learned, no business is being done in these markets.

Current Quotations British Coal f.o.b. Port, Gross Tons

	Dec. 31	†Jan. 7†
Cardiff:		
Admiralty, Large	26s.	*24s. 6d@25s.*
Steam, Smalls	19s.	*18s. 6d.@19s.*
Newcastle:		
Best Steams	23s. 9d.	*23s. 6d.*
Best Gas	21s. 9d.	21s. 6d.@22s.
Best Bunkers	21s. 6d.	*21s.@21s. 6d.*

† Advance over previous week shown in heavy type declines in *italics*.

Export Clearances, Week Ended Jan. 5, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Du. S.S. Maashaven, for Port of Spain	3,081
For Chile:	
Am. S.S. Argosy, for Pisagua	1,067
For Cuba:	
Am. S.S. Ozama, for Havana	2,570
Dan. S. S. Viborg for Havana	2,890
For Canada:	
Br. Schr. Seaman A. O., for St. Johns, N. B.	692
For India:	
Br. S. S. Kabinga, for Singapore	1,792
Am. Schr. Guilford D. Pendleton, for St. Thomas	2,163
FROM PHILADELPHIA:	
For Brazil:	
Nor. S.S. Margit Skogland, for Rio de Janeiro	——
For Nova Scotia:	
Br. Schr. Madelyn E. Hebb, for Lunenberg	——

Hampton Roads Pier Situation

	Week Ended Dec. 29	Week Ended Jan. 5
N. & W. Piers—Lamberts Point:		
Cars on hand	1,757	1,103
Tons on hand	97,718	66,424
Tons dumped	72,684	94,234
Tonnage waiting	2,300	2,800
Virginian Ry. Piers Sewalls Point:		
Cars on hand	922	926
Tons on hand	62,500	51,400
Tons dumped	50,023	73,293
Tonnage waiting	19,435	10,418
C. & O. Piers—Newport News:		
Cars on hand	864	616
Tons on hand	43,200	30,800
Tons dumped	33,995	44,800
Tonnage waiting	1,537	———

Export Markets Return to British

A comparison of the overseas coal trade of the United States and of the United Kingdom has been made by F. R. Wadleigh of the Department of Commerce. His compilation is as follows:

OVERSEAS EXPORTS OF BITUMINOUS COAL IN GROSS TONS

	United States	United Kingdom
1913	4,101,658	73,400,118
1914	4,232,569	59,039,880
1915	5,987,892	43,534,771
1916	6,941,352	38,350,553
1917	4,923,404	34,995,787
1918	3,764,645	31,752,904
1919	7,187,345	35,249,568
1920	19,695,790	24,931,853
1921 (11 mo.)	8,377,749	20,351,390
1921		
July	1,326,517	816,132
August	362,399	3,103,207
September	163,106	3,406,579
October	195,209	3,405,792
November	179,413	3,593,864

The figures for the United States, 1913, 1914 and 1915 are fiscal years ended June 30. The others are calendar years.

Destination of British Coal Exports, November, 1913, 1920, and 1921

Country	Quantity (Tons) November 1913	1920	1921
Russia	379,347	6,728	26,691
Sweden	404,540	47,357	190,296
Norway	207,766	20,757	85,604
Denmark	244,970	35,041	185,238
Germany	677,074	....	99,610
Netherlands	157,610	15,554	237,827
Belgium	162,091	7,471	119,099
France	1,031,427	744,521	1,033,986
Portugal	89,872	38,463	51,021
Asores and Madeira	11,852	....	....
Spain	200,338	30,795	111,779
Canary Islands	80,411	....	34,600
Italy	784,135	183,364	497,067
Austria Hungary	78,066	1,410	....
Greece	75,573	....	19,984
Algeria	113,832	15,730	54,213
French West Africa	7,391	7,317	4,402
Portuguese W. Africa	12,838	4,522	13,677
Chile	49,052	9	8,065
Brazil	137,971	6,264	52,285
Uruguay	56,039	....	37,459
Argentine Republic	290,262	10,629	94,137
Channel Islands	16,667	9,244	14,471
Gibraltar	40,897	70,730	42,756
Malta	73,060	18,306	13,946
Egypt	315,300	42,908	221,936
Anglo-Egyptian Sudan	....	....	162
Aden and Depend.	5,981	....	4,495
British India	11,955	14	104,086
Ceylon	15,420	....	23,361
Other Countries	181,667	43,590	211,611
Total	5,913,404	1,360,724	3,593,864

United States November Exports of Coal and Coke, by Customs Districts

Customs Districts	Anthracite (Gross Tons)	Bituminous (Gross Tons)	Coke
Maine and N. H.	24	75	56
Vermont	3,704	647	204
Massachusetts	75	12,325	......
St. Lawrence	90,570	132,374	2,944
Rochester	22,959	24,877	21
Buffalo	184,541	226,673	8,185
New York	11,198	719	3
Philadelphia	5,824	14,948	495
Maryland	......	36,671	3,567
Virginia	......	111,451	......
South Carolina	......	8,458	......
Florida	......	5	93
Mobile	......	1,764	......
New Orleans	......	1,865	4
San Antonio	306	215	2,362
El Paso	70	5,472	720
San Diego	11	5	......
Arizona	277	1,751	......
Los Angeles	......	6	......
San Francisco	......	......	6
Washington	291	2,199	......
Dakota	6,783	5,817	1,670
Duluth and Superior	2,452	5,727	197
Michigan	290	118,196	8,630
Ohio	5	366,527	1,190
Total	329,380	1,078,767	30,347

Reports From the Market Centers

New England

BOSTON

Market Very Quiet—Buyers Show Little Interest—Prices More Stable—Coastwise Freights Easy—All-Rail Territory Narrows—Anthracite Dull.

Bituminous—The market continues extremely dull. There is a certain tonnage being observed from week to week by small users, but the aggregate is not large and for the most part is restricted to Hampton Roads coals on cars at re-handling points like Boston and Providence. There is scattering business also on rail coal in the Western part of this territory but movement in that direction also continues light.

Reserves are being depleted only very slowly and buyers are quite indifferent to current offerings. For those who keep in touch with the market there is every inducement to withhold purchases until as nearly as possible the last moment. "Market cargoes" still come forward, and while there is less forcing on the part of the agencies there are enough low prices made on tail-ends to keep prominently before buyers the generally ragged state of the market. Less than $6 has been taken on cars Boston for Hampton Roads coal and on any such basis there is of course no chance whatever within 100 miles of Boston for Pennsylvania grades. The latter seem to be confined to small requisitions in the narrow zone that is now safely all-rail.

Reports from the loading piers show much less coal standing at the Roads. The trade judges from this that smokeless operators are mining for the most part only on orders and in sections where there have been agreements to pay less wages than the union scale that is still officially in effect. Spot prices f.o.b. Norfolk and Newport News are somewhat firmer on a basis not far from $4.75 per gross ton. It all tends to show that mine-owners are less inclined to produce at a loss than was the case during the summer. Now that cost figures are available for the whole of 1921 most of the mining interests are expected to adopt a close-hauled policy with respect to spot business.

In all quarters quotations seem to have settled into grooves. There is less fluctuation and it is quite apparent that offers are individual; they rest more upon special local conditions in the mining districts than on any general market level. At the Philadelphia and New York piers there is almost nothing doing on the Pennsylvania grades. While on these coals the water route figures less than all-rail, yet Pocahontas and New River via Hampton Roads figure still so much less, because of a lower f.o.b. mine basis, that the latter naturally have the call.

Anthracite—The trade shows no sign of improvement. Retail business is still light, although a few seasonable days have helped the dealers somewhat in reducing their large stocks. Independent shippers are offering egg and pea at very material cuts, as compared with company circulars, but it does not appear that such a policy helps very much in moving coal in this kind of market. The publicity of it only reacts unfavorably on the retail trade.

Tidewater—East

NEW YORK

Retail Prices Are Cut—Surplus Stocks at Local Piers Reduced—Bituminous Market Firmer—Suspension of Mining Helps Situation — Movement Menaced by Harbor Strike.

Anthracite—The suspension of operations in many mines over the holidays and several days of good coal consuming weather helped the anthracite industry. Retail dealers put in a busy week or ten days and this activity is now being felt in the wholesale market.

While the piers are not blocked with coal as before the holiday season stocks are still large. Some companies it was said had loaded several idle boats in order to save car charges.

Egg coal, which has been one of the stumbling blocks, is now active. Apartment house owners are refilling their bins. There is a fairly good movement in stove and chestnut but not in pea.

The cleaning up of considerable surplus coal at the docks caused a firmness in independent quotations. Pressure on the steam coals was much easier. Demand was strongest for barley. The better grades brought company circular. Buckwheat and rice were not so active.

Bituminous—There is a little more activity now that stocks on local piers are shortening. This market is in a much healthier condition. There is less coal here than at any time in more than a year. Near the end of the past week there were only about 800 cars at the piers.

Inquiries are again on the increase but little actual business is reported. Large consumers were not likely to make contracts at present prices and when they do, those contracts will provide that the buyer will get the benefit of any reduction in wage cuts. One large house was quoting on a basis of $3.20 f.o.b. mine, with the wage provision.

The strike of the harbor boatmen inaugurated the last of the week has not lasted sufficient time to have any effect on the market. It was said that nearly 500 men quit work in protest against the cut in pay offered by the boatowners. The lack of demand, however, and the few tugs and boats necessary to move the coal needed, resulted in small inconvenience to the trade.

Average quotations showed slight increases in most coal. While the war tax was elminated on Jan. 1, there was

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considerable coal at the piers or on the way from the mines on which the tax had already been paid.

A reduction of approximately 25c. per ton was announced on Jan. 2 in the retail price of the domestic sizes in Manhattan and Brooklyn. The delivery prices in Manhattan do not include labor which those for Brooklyn include putting the domestic coals in bins. The schedule of prices follow:

	Manhattan	Brooklyn
Broken	$12.85	$12.90
Egg	12.85	12.90
Stove	13.10	13.15
Chestnut	13.10	13.15
Pea	10.75	10.90
Buckwheat	7.65	7.80
Rice	6.75	6.80
Barley	5.75	5.80
Bituminous	8.00	7.65

BUFFALO

Demand Not Improving—Both Bituminous and Anthracite Slow—Large Amounts of Anthracite on Track.

Bituminous—Demand is rather less than it was, but that was expected, for consumption during the holidays was light and the consumer is not stocking up, mainly because his storage space is full of coal bought at his own price.

Many operators looking into the future, say they will not pay the check-off and wages must drop to the 1917 scale. As a rule their mines are idle. Quotations of bituminous continue at $2.75 for Youghiogheny lump, $2.50 for Pittsburgh and No. 8 lump, $2.25 for Allegheny Valley and all mine run, and $2.50@$2.70 for slack.

Anthracite—Members of this trade find it about as dull as bituminous. Reports from the mining districts tell of the thousands of cars that are standing on tracks because the demand has been smaller than was estimated. Some of the coal has been sold at sacrifice prices, something that has not happened in that trade in a long time, if ever. During most winters of late the demand was close up to capacity output and often Buffalo has had to be given an extra allotment to satisfy the clamor and stave off what threatened to be a panic. Now the demand is seldom good more than one day at a time.

PHILADELPHIA

Independent Anthracite Prices Drop—Much Retail Price Cutting—Only Stove and Nut in Demand—Companies Store Coal—Steam Sizes in Moderate Call—Bituminous Quiet—Market Prices Firm.

Anthracite — The year opened with the independent operators generally reducing prices to company level on stove and nut and frequently below on egg and pea. On the two most desired sizes, stove and nut, $8.10 are the most frequently quoted independent prices, while on egg quite a number are making sales at $7.60, and on pea all are below the company circular, $5.50 being the ruling figure.

On top of the price reductions by independents, the leading retailers made a 25c. reduction to the consumer, with prices as follows: Egg $14, stove and nut $14.25, and pea, $11. However, numerous prices much lower than these have been prevalent for several weeks all over the city.

Steam coals are in moderate demand only, with buckwheat and barley in best call.

Bituminous—The first week of the new year has passed and the hoped-for increase in buying has not developed. It is true there are and have been numerous inquiries for prices, but only light business has developed. There is nothing new in the industrial situation, as the principal factor—the iron trade—makes no appreciable advance in this district, there being as many curtailments as reports of increased activity.

As usual there have been coal contracts expiring the first of the year, although not as many as ordinarily, but it has been difficult for producers to negotiate new agreements. The consumer is convinced that it is more economical to buy in the open market. Under present operating conditions it is extremely difficult for the producer to arrive at a contract price and for this and the above reason there has been an extremely light tonnage entered into.

Prices are far from strong, but manage to hover around the low levels of the past few weeks. Of course the best qualities are in the strongest demand, but even among them there is no real activity.

BALTIMORE

General Business Conditions Are More Encouraging—Fuel Purchases Increase—Prices Continue Weak—Hard Coal Demand Only Medium.

Bituminous—Inquiry in mercantile and manufacturing circles generally brings the information that business is improving surely, if slowly. A little better demand is noted also in line trading for coal, but the fuel men here feel that this is due in most part to the fact that many industries are laying in stocks of even moderate size in order to prevent this being placed against their 1921 inventories. This purchasing after all is but a form of delayed buying.

The price basis at present in the keen business competition that is taking place is far from satisfactory. While the ordinary run of the market is above some of the individual selling by considerable figures, it is noteworthy that some Pool 71 coal exchanged hands here the past week as low as $2 a net ton f.o.b. mines.

The harbor situation has been none too active since the first of January. The only movement credited to export is two schooners loaded for Porto Rico with a total of 1,899 tons, and two steamers loaded for Boston.

Anthracite—The situation drags on without particular interest. No move has been made as yet for a retail price reduction as a result of the removal of the tax on freight. Local dealers have felt that the margin of profit here has been none too favorable, no effort having been made to make a winter advance as was done in many former years.

Northwest

MILWAUKEE

Cold Wave Stimulates Buying in Both City and Country—Rush of Orders Reveals Slim Supplies in Consumers' Bins—Storage Fires Do Some Damage.

Uncertain weather and reports of cold waves in portions of the East and West brought about a rush of orders to Milwaukee coal dealers. City deliveries and rail shipments are now on a winter basis as far as anthracite and domestic grades of bituminous coal are concerned. City orders reveal the insufficiency of supplies laid in by consumers. Orders continue small in quantity, however. Steam coal is in poor demand.

The new year brought no changes in prices of coal or coke.

A new crop of damaged soft coal screenings will probably be forced upon the market as a result of a fierce wind storm which fanned smouldering fires in soft coal piles along the Menomonee River. It is estimated that fires of this nature in the coal district have inflicted more than $100,000 damage in the last two years.

DULUTH

Price Drops All Around—More Reductions May Be Coming—Iron Mines Begin Buying Again.

The first price cut of the season occurred in hard coal with the opening of the new year. A general reduction of 20c. all around has been announced by dock men and retail prices have also been cut. Many coal men look upon this as the first indication of a weaker market with more and greater cuts to come soon. Others contend that the cut as announced will bring the desired results and that coal will move.

Prices from the docks on anthracite now are, egg, $12.55; stove and nut, $12.80; pea, $11; buckwheat, $6.

The cut in soft coal last week averaging $1 has been passed on by the retailers to the consumer, changing retail prices at the Head-of-the-Lakes materially. Pocahontas lump is now selling to the consumer at $11.50, with about a $2 drop for mine run, and Youghiogheny, Hocking, and Splint are selling at $8.50 for lump and $8 for run of pile. Steam screenings are sold at $5 retail leaving only a margin of $1 between the retail and wholesale prices.

Shipments have dropped off in the main during the last week, due to another spell of mild weather, but an increased demand has appeared in the last day or two for screenings. Dock companies have received orders from two mines on the iron range which are starting operations.

MINNEAPOLIS

Market Absolutely Refuses To Quicken—Rail Tonnage Reduces—Dock Business Steadily Lessens.

There is seemingly no hope for the coal trade to profit this winter. The only thing that could be asked as a business-maker, would be an old-fashioned blizzard with roads tied up.

Everything else that formerly developed an active coal demand has come and gone with but little effect.

There have even been reductions in various grades of coal though jobbers insist soft coal from Eastern mines is now sold at less than cost. Even hard coal, whose list prices are supposed to be a close second to the laws of the Medes and Persians, is quoted 15c. lower by two local concerns.

The tonnage moving from the docks to the interior is less than the average even though it picks up now and then and comparative figures for certain periods may show a little gain over former years. And in view of the reduced tonnage of all-rail coal to this district, the dock business should show a gain. The fact remains that business continues to be curtailed. The domestic trade is running closer and economizing more. The steam trade is doing everything possible to keep consumption down.

The Northwest will be actively using coal for heating purposes for three or four months yet. But the active period will fall away in about two months. And industrially there has been no material change for the better. Of late, some shops and plants which were closed for a fortnight or so over the holidays, have been resuming. Some local railroad shops are reported to be due for increased activity. But as production in many lines has been at a low ebb for a long time, there is room for a considerable increase in this direction before things are at all lively.

Inland West

DETROIT

Little Demand for Either Steam or Domestic Sizes of Bituminous—Receipts Light — Most Shipments Come from West Virginia Unorganized Districts.

Bituminous—Sales of bituminous coal are still light. Neither steam nor domestic sizes are arousing any interest. Consumers of steam coal are buying small quantities spasmodically. Though some of the steam plants are taking coal only when the opportunity arises to pick up a bargain, nearly all are reported to have accumulated a supply in excess of present needs.

The movement of coal into Detroit is light. Jobbers say that the greater proportion of the shipments now coming this way are from the unorganized districts of West Virginia and that because of their advantageous position in the matter of costs, the number of mines in union districts, offering competition is steadily decreasing.

West Virginia 4-in. lump is quoted at $3 a ton, 2-in. lump, $2.50, egg $2.25, mine run $1.75, and slack $1.25. Ohio 3-in. lump is $3, egg $2.25, mine run $2, and slack $1.50. Pittsburgh No. 8, 1¼-in. is $2.35, ¾-in. lump $2.25, mine run $2, and slack $1.75. Smokeless lump and egg is $3.50, mine run $2.25, slack $1.75.

Anthracite—Buying of anthracite by household consumers is not measuring up to expectations of retailers, who still have heavy stocks.

CLEVELAND

Industrial Demand Still Depressed—Improvement Expected Soon—Markets Dull Save Slack—Retail Trade Quiet.

Demand from railroads and public utilities continues to supply the main support of the coal market. Industrial consumption is exceedingly low, but the next few weeks is expected to see some improvement due to the fact that some plants are planning to resume operations. The record of employment for Cleveland in December, showing a decrease of 3.8 per cent during the month, tells the story of the slackened fuel demand.

In the automobile and accessory plants alone the decrease was 19 per cent. In the steel industry there were 9 per cent fewer employees on the payrolls than one month before. These figures are significant inasmuch as these two groups of industry comprise the most important activities in this district.

In the steel industry the outlook is especially good. In July operations stood at 18 per cent of capacity. They advanced to 50 per cent by November, and dropped to 40 per cent in December. Improvement is already beginning and it is expected to continue gradually until average operations reach from 60 to 75 per cent by late spring. The extent to which industrial improvement goes will control the degree of expansion in the coal market over the next few months.

A coal strike of course would disturb the whole situation. Some operators still believe that a strike is inevitable, but hope has not been abandoned that a settlement will be reached.

The continued suspension of mine operations is causing further strength in screenings. Steam slack is now quoted at $2 f.o.b. mines. This is the highest price for this grade in some months. Contract negotiations are virtually absent as both operators and consumers are unwilling to enter into future agreements on the present basis of prices.

Bituminous coal receipts for the week ended Dec. 31 show a decrease of 148 cars. Total was 964 cars; divided, industrial 693, retail 271.

CINCINNATI

Mild Weather and Renewed Mining Soften the Market—One Jobber Starts Break in Domestic Prices — Retailers Juggle Quotations.

Mild weather and the resumption of many mines in the nearby producing territory have softened the market again. The smokeless mines are reported to be working 10 per cent higher this week. Many mines in the New River district are also coming in while southeastern Kentucky is working back to the mark set before the Christmas shutdown occurred.

Another break in the price of domestic coals came because of weather conditions and the activities of one of the Cincinnati wholesalers. Southeastern Kentucky coals were offered at $2.50 for lump and before the price was a week old most of the other selling mediums as well as the mines had met the price. Bituminous slack still held above the dollar-mark but it was expected that this would be knocked a cropper as soon as the cars start to stall at the weighing yards and points of distribution. Smokeless is firm. January circulars show $3.25 asked for lump and egg but sales are all the way to fifty cents lower.

One large firm of retailers "shot the market" here recently. In flaring advertisements it announced smokeless lump at $8, a reduction of $1.50. Mine run was offered at $6.50 and slack at $5.50. The concern also offered bituminous at $6.50 for lump and $6 for mine run and slack at $4.50. These prices are 50c.@$1 below that being asked by other retailers. Those who were offering bituminous slack at $4 have raised the price to $4.50 for the reason that they "are out of their original supply."

COLUMBUS

Cold Weather Wakens Domestic Demand—Drop in Lake Prices Has a Spreading Effect—Production Ranges From 17 to 40 Per Cent.

A slight increase in domestic demand has developed because of colder weather. Steam trade is still slow. Lake prices have dropped under the influence of competition.

Household orders, as a rule, are small because of the fact that most of the frugal householders have put in their winter's supply. Retail prices have stiffened under the influence of better buying but no marked advances have been recorded.

Hocking lump is selling around $6@$6.50 delivered while West Virginia splints sell at $6.75@$7.25. Pocahontas is weakening and is sold at $8.25@$9 while anthracite is selling around $14.50. Retail stocks are still fairly good, for dealers had extra large stocks following the threat of a rail strike.

The steam trade is slow. A few manufacturers are resuming operations following the holiday period and consumption is increasing slightly. Reserve stocks are still large and this mitigates against a more active demand. Railroads are buying only current needs. Because of curtailment in lump production, screenings are stronger and prices range around $1.50. This is causing many plants, which have crushers to buy mine run as the price is not much higher than for slack. Public utilities are the best steam customers at this time.

ST. LOUIS

Weather Eases Demand on Steam and Domestic—Surplus of All Kinds Exists—Public Waits for Prices to Break.

The situation is typical of midwest conditions. Only the cheapest kinds of coal are moving and even those in small lots. Warm weather setting in after the first of the year brought things to a standstill. No general buying movement has yet materialized.

The little domestic that is moving is mostly Standard. It is in scattered lots. Mt. Olive is moving to some extent but Carterville is slow and anthracite and smokeless are dead. There is a little activity in coke but not enough to meet expectations.

Steam in the city is easy. A little call for screenings in carloads has developed. Other than that things are far below normal at this season.

MIDWEST REVIEW

Heavier Domestic Production Softens Screenings—Some Buying for Reserve—Early Conference Sought with U. M. W.—Necessity for Lower Costs.

The first week of the new year saw no improvement in the coal market. Demand for domestic coals continued but little better than sluggish, while steam coals are still selling below cost.

Owing to some seasonably cold weather there has been a little better demand for domestic coal. This is especially true of portions of Iowa, Minnesota and North and South Dakota. Retailers, however, are hanging back and refusing to place business, on the ground that the public is refusing to buy. The average retailer very strongly believes that it will be a week or so now before freight rates are reduced, and he adheres to this idea in spite of all information to the contrary.

What little domestic coal is purchased is being bought only in a hand-to-mouth manner. Two or three years ago in the winter months the dealer would place an order calling for three, four and five cars a week to continue for the winter months, whereas this year he is only buying one car at a time and haggling long and carefully over the price of each individual shipment. When he does buy he is influenced often by a cut price rather than by quality.

The market on steam coals, especially screenings, is a little easier this week, principally because some mines worked and produced coal to take care of the demand from the country for domestic sizes. Indiana screenings, in some cases, can be bought as low as $1.50, but perhaps the average price for the whole territory would be in the vicinity of $1.75@$1.80.

Middle West operators are now thoroughly aroused to the danger of competition from non-union mines in the East, and operators recently took their first steps in a campaign to put their selling prices more in line with competition they are encountering from the East. One of the operators' associations, representing practically all of Illinois' tonnage, sent a telegram to Mr. Lewis, president of the United Mine Workers, requesting that an early conference be called for the purpose of talking over wage reductions and the abolition of the check-off system. Until wages are reduced and the check-off abolished, Indiana and Illinois operators will be at a great disadvantage and can look forward to the prospect of seeing their own logical territory invaded by cheaper Eastern coals and their customers taken away from them.

The situation has developed into this: The check-off will have to be abolished and wages will have to be reduced in Illinois and Indiana, or the non-union fields in Kentucky and West Virginia will have to be unionized.

West

DENVER

Pueblo Steel Mills Reopen—1922 Outlook Puzzling—Bituminous and Lignite Prices Are $1 to $2 Under 1921—Wages Going Down.

Reopening of the steel mill at Pueblo has stimulated mining a little. They consume about 2,000 tons daily. The old year closed with a decrease of about 2,500,000 tons over 1920. Uncertainty over freight rates, coal miners' wage demands and a lack of industrial development make the new year outlook puzzling.

Bituminous lump is retailing for $1 less than last year, and lignite lump is $1@$2 less.

Twelve of the thirteen operating mines of the Colorado Fuel and Iron Co. have a larger number of miners than before the strike.

Acceptance by virtually all miners in southern Colorado of the wage cut announced by independent companies in the last six weeks is predicted by operators. Mines have been shut in one or two places pending the inauguration of the 30 per cent cut the middle of January.

SALT LAKE CITY

Demand Is Slight—Coast Business Still Low—Miners at Wattis Vote Down Wage Cut.

Coal business is quiet. The weather is springlike and consumption is about 60 per cent of normal. Coast business has not improved. Prices remain firm and there is a plentiful supply of labor and cars.

So far wages have not been cut although there is talk of it. A mass meeting of miners at Wattis recently voted four to one against a reduction of 20 per cent. State mining officials estimate that the 1921 production will be 4,100,000 tons compared with 6,004,788, in 1920.

Southwest

KANSAS CITY

Mercury Is Agile but Coal Market Registers Hardly a Shiver—Drop in Freight Rates May Help—Dealers Stocked Heavily.

The thermometer races up one day and down the next. The first of the week we had all four seasons of the year in one day. The only thing that remains steady is the light demand for domestic grades of coal.

The recession in freight rates, particularly on grain, forage, and live stock will have some effect on business generally in this section and while no rush is anticipated a slow but steady increase in volume is confidently expected.

Steam coal continues to be in strong demand, not on account of any shortage but because the operators are unable to dispose of the coarser grades. Some changes were noticeable in the price for Arkansas smokeless.

Prices are as follows, f.o.b. mines: Kansas lump, $5; mine run, $4@$4.25; nut, $4.50; mill, $2.75; slack, $2.50; north Missouri lump, $4.25; mine run, $3.50; washed slack, $3.25; raw slack, $2.50. Arkansas lump, $6; mine run, $3.75@$4.25; slack, $2.50. McAlester Oklahoma lump, $8.50; nut, $7; slack, $2.50. Central Illinois lump, $2.50; egg, $2.25; slack, $2. Franklin County, Illinois lump, $4.25; egg, $4.05.

South

BIRMINGHAM

Turn of the Year Shows Little Market Improvement — Cold Spell of Short Duration Brings Flood of Small Retail Orders — Prices Without Material Change.

The only activity of any note in the trade the past week was due to a cold snap which lasted several days, and caused a run on local yards for domestic coal. Quite a good tonnage was moved in the aggregate, but orders individually were mostly for one ton and under, and the rush did not last long enough to relieve stocks to an extent which would enable dealers to again enter the market.

There is little if any change in the commercial market, some agencies reporting a slightly better inquiry the past week. Several ships arrived in Gulf ports and are now taking on bunker coal from this district, this line of trade having been very quiet for several weeks past. Even should industry strike a pace under which normally consumers would stock coal, it is not believed that such steps would be taken beyond the actual safety limit, due to the anticipated freight reduction, which will not materialize before April 1.

Quotations f.o.b. mines on steam and domestic are unchanged except for a rise on Cahaba domestic sizes and a decline on Carona lump and nut. These quotations now range $4.50@$6 and $4@$4.25, respectively.

LOUISVILLE

Consumption Low, but Retailers Get Better Demand—Jobbers Find Business Quiet — Production Light — Prices Fairly Steady.

Prices have been fairly steady the past week except on screenings, which are weaker as a result of lighter industrial consumption during inventory. Mines are watching for wage contract renewals in unionized fields, and some operators are not willing to take contracts, even in non-union fields.

Colder weather the end of December resulted in slightly better retail demand, but retailers have comparatively large stocks. Retail prices have been cut 50c.@$1 a ton, and are quoted thus: Eastern Kentucky, $6.75@$7.25 delivered and western Kentucky and West Virginia $5.75@$6.25 delivered.

Demand has not opened up for steam coal so far, although a few inquiries are being received. Retailers other than the ones who carry small stocks are not buying much. A better demand is expected soon.

Jobbers report numerous low offers on spot shipments, which in some cases represent coal that has not even been mined, and which is quoted 25c.@50c. and more under the market. Mine run has been especially hard for the small mine to sell in competition with the big mines that are hungry for business. Labor is very plentiful and cheap.

General business in Louisville for the closing year showed less than an 18 per cent loss in bank clearings, the total for the year being $1,199,299,211 as against $1,556,022,712 in 1920, a loss of $356,723,501. Business at the close of the year was far more active than was the case at the close of 1920.

News From the Coal Fields

Northern Appalachian

PITTSBURGH

Demand Remains Low — Operators Determined Not to Rejoin Central Competitive Field to Make New Wage Scale.

Coal demand is as poor as at any time. There is no improvement apparent on account of its being the winter season, or on account of the commonly reported increase in industrial activity. Furthermore there is no demand traceable to expectation on the part of buyers that there will be a cessation of mining in the union fields April 1.

The test of the volume of coal demand in general is furnished not so much by the market for Pittsburgh coal, which has been extremely small right along, as by the demand for Connellsville coal, mined under open-shop conditions and at much lower cost than obtains in the Pittsburgh district. The demand for Connellsville coal has been fairly good for many months, but of late it seems to have decreased somewhat—at any rate slightly lower prices have been quoted lately, down to $1.60 for mine run on large tonnages for nearby deliveries.

Operators observe with interest the efforts of officials of the United Mine Workers to encourage the Illinois operators to bring together again the parts of the central competitive field for the purpose of wage scale negotiations. The Pittsburgh district stands by its determination not to participate, but to negotiate with their miners separately or in connection with operators of other districts in Pennsylvania, and in particular with Freeport, Butler-Mercer and central Pennsylvania.

The market remains quotable as follows: Steam slack, $1.40@$1.50; gas slack, $1.75@$1.85; steam mine run and ordinary gas, $2.10@$2.20; ¾-in., $2.60@$2.70; Panhandle 1¼-in. domestic, $2.75@3; high-grade gas mine run, $3.

CENTRAL PENNSYLVANIA

Outlook Not Promising — Demand Is Stagnant—Revision of Costs Necessary.

There is no promise of a betterment of conditions in the field for some months, at least. In speaking of the business, Secretary O'Neil of the Central Pennsylvania Coal Producer's Association, said: "There is only one thing to say now, and that it is worse." It is expected that much of the time of the next three months will be taken up on the wage dispute, although operators have received no notification from the officials of the United Mine Workers looking toward a meeting. Such as was contemplated in the Pittsburgh and Ohio fields, which was called off because the operators refused to meet the mine workers' officials.

CONNELLSVILLE

Contract Furnace Coke Market Softer —Byproduct Coke Is Cheap—Spot Market Inactive.

The contract furnace coke market presents a safer aspect. First-quarter contracts previously reported were at $3.25, $3.40 and $3.50. In the past week quotations of $3.25 have been common and it is believed the price could be shaded to $3.15 if not still more. It is generally remarked that consumers who paid $3.40 or $3.50 bought too soon. The necessary contracting is probably all completed by this time, leaving some operators without business when they would be satisfied to have it at less than $3.25. While the contracting in general has been at $3.25@$3.50 there has been some business done at less than $3.25. One contract went at $3.20, to a consumer who had been using byproduct coke from Youngstown in the last quarter of the old year, and one or two contracts that ran over Jan. 1 at higher prices have beeen adjusted to $3.15 or less to enable the furnaces involved to stay in blast.

An inquiry for 18,000 tons a month for the Trumbull-Cliffs furnace at Warren, Ohio, which was expected to go into blast about Jan. 15, went to the Youngstown Sheet & Tube Co., for byproduct coke at $2.90, Connellsville basis. It appears that the price was not forced to $2.90 on account of Connellsville competition, but to enable the furnace to blow in. The buyer takes the coke only if furnace operates, while the seller can withdraw should it find it needs the coke for its own furnaces. The seller loses on the coke, but makes up the loss by the value of byproducts. There is a 90c. freight charge to absorb on the coke. The coal usually used in making this coke is 20 per cent Connellsville and 80 per cent Pocahontas.

The spot market shows no reportable change as there has been no inquiry to develop anything. Foundry coke is in poor demand. Quotations are: Spot furnace, $2.75@$3; contract furnace, $3.20@3.25; spot foundry, $3.75@$4.50.

The *Courier* reports production in the week ended Dec. 31 at 55,260 tons by the furnace ovens, a decrease of 1,630 tons, and 33,170 tons by the merchant ovens, an increase of 830 tons, making a total of 88,430 tons, a decrease of 800 tons.

UNIONTOWN

More Coke Agreements Made — Only Short-Term Contracts Closed—Future Market Uncertain.

Some operators see in the closing of furnace coke contracts for 1922 delivery a recovery of the coke market. The price for 1922 delivery is $3.15@$3.40. The minimum figure is understood to have concerned only January delivery and the maximum figure for brands known to be of excellent quality.

All of the prices heard for new contracts are an advance over the spot market. The fact that consumers were willing to see a figure above the spot market to insure delivery of coke may have a strengthening effect upon the market.

It is also significant that no coke contracts were made for a period longer than three months, expiring March 31. It is pretty generally conceded that a labor crisis will face the industry at that time. While the Connellsville region is unorganized and therefore not directly concerned in wage negotiations in the union fields a suspension of production in the union fields will send consumers here for tonnage.

Coke and coal always being sympathetic in price, a sudden demand for coal tonnage would undoubtedly send the price of coke upward and foreseeing such a possibility producers here declined to contract for tonnage over a three months period. The uncertainty in the steel and pig iron industry especially as regards freight rates made such an attitude entirely acceptable to coke consumers.

EASTERN OHIO

Output Bounds Upward in Last Week of December But Month Total Is Low—Records on Working Time Are Better —Production for 1921 is 55 Per Cent of Capacity.

Contrary to predictions eastern Ohio produced on each of the five work days during the week ended Dec. 31 a greater daily tonnage than the average for any previous week of the month. The tonnage mined amounted to 257,000 tons or 49½ per cent of five-day capacity based on the total railroad rating of 520,000. However, during the same week of 1920, 320,000 tons were mined and the month's output is the lowest of any December in years.

Figures given out by the Pittsburgh Vein Operators' Association indicate that due to the short week, the percentage of time worked is more than that of the preceding week at mines on all railroads serving this field. Association mines worked 40 per cent of possible worktime as compared with 35 per cent the previous week. The time lost account "no market" was about 60 per cent as compared with 64 per cent last week.

Cumulative figures for the calendar year show that mines in eastern Ohio field produced 18,031,000 tons as against a potential capacity of 32,212,000 tons, or that 55 per cent of capacity was mined during the year.

One large operator ventures the prophesy that production in Ohio will continue at about the present volume throughout January, but that beginning with February considerable demand will develop, not only in increased requirements for current needs, but in purchases for reserves to be built up in anticipation of labor troubles at the mines. Demand in retail trade has been assisted materially by the colder weather which has prevailed during the past ten days.

The turn of the year finds activities in most industrial centers throughout this section somewhat diminished. The volume of freight traffic on the railroads is 35 to 40 per cent of normal. However, the percentage of coal being mined for railroad fuel is estimated between 40 and 50 per cent of normal.

Due to the continued under-production of prepared sizes at the mines, No. 8 spot slack stiffened somewhat during the week, and some small lots are reported sold at $2 per ton.

ANTHRACITE

Mines and Collieries Resume Work—Lehigh Valley Miners' Strike Is Settled on Company's Terms.

Last week showed a marked improvement in the number of collieries resuming work. All of the mines of the Glen Alden Coal Co. are again operating after a ten days' shutdown. The Temple Coal Co. has likewise resumed operations. Other companies which were only operating every other day are gradually approaching normal time.

The strike of the Lehigh Valley has been settled and the men will return to work as fast as the company opens the mines. The men were forced to accept the company's terms. This was an outlaw strike.

UPPER POTOMAC

Deadly Dull Week—Contract Shipments Curtailed—Wage Cut Is in Prospect.

The last week of 1921 was deadly dull because of curtailed contract shipments. There was no spot demand. There is a move on foot to reduce wages in order to permit operators in the Upper Potomac and Georges Creek regions to meet non-union competition.

FAIRMONT AND PANHANDLE

Last Week of 1921 Worst of Year—Spot Business Dead and Contract Shipments Cut to the Quick—Prices Remain Low.

FAIRMONT

The last week of 1921 was the worst of the year from a production standpoint. Not more than 40 mines were in operation and they ran not more than two days a week. There was no spot business and contract shipments were cut to the quick by the holiday and inventory period. About the only loadings during the week were for railroads.

There was so little demand for mine run that it did not bring any more than nut and slack. The price on all three grades ranged $1.25@$1.50 and on prepared, $2.15@$2.50.

NORTHERN PANHANDLE

Production in the northern Panhandle was extremely low owing to the holiday lull, suspended contract orders and light railroad fuel loadings. Mines here could not compete with non-union fields. Operators having railroad fuel contracts were getting out a little coal but much less than normal. Prepared coal had no sale even at $2@$2.50 a ton and mine run was not moving at all except on contract. Slack ranged $1.25@$1.60.

Middle West

SOUTHERN ILLINOIS

Warmer Weather Floors the Coal Man—Curtailed Production the Only Hope—Railroad Tonnage Light—Prices Are Shaky.

Southern Illinois operating conditions are most trying and it is only by careful handling of the situation that the entire market does not go to pieces and all operators sustain heavy losses. The larger operators are shutting down their mines rather than produce coal at a loss. This seems to be the only solution of a bad problem.

Independents have cut their prices under the cost of production. The few mines that are working get one and two days a week. Railroad tonnage is lighter. Dissatisfaction among the miners continues to grow.

Somewhat similar conditions prevail in the Duquoin field and also in Jackson County, outside of Murphysboro. Duquoin mines, however, are not getting as much working time as those in the Carterville field that are working. At Murphysboro the Big Muddy coal is selling $4.50@$5 for domestic sizes, screenings at $2.50 and up.

Mt. Olive conditions are unusually bad. Mines are getting one and two days a week. A fairly good tonnage is moving North and Northwest of steam sizes, but domestic is hard to sell. This coal is now selling in the Kansas City market at $2.50 for domestic sizes, whereas the country price is $3.75 and the St. Louis and Chicago price $3. Screenings are worth about $1.50, when available.

There is a price war on in Kansas City on Illinois coal and one Springfield operator is reported as having 15,000 tons on the ground in Kansas City that is going to force a heavy loss.

The Standard field is in bad shape. Several mines are idle and expect to remain so until conditions improve. There seems to be no demand for either steam or domestic although steam is moving a trifle better, screenings perhaps being the best.

WESTERN KENTUCKY

Demand Slow but Prospects Brighter — Screenings Weaker — Mines Await New Wages Before Making Contracts.

Mine business has been slow the past few days, but with slightly colder weather there has been a barely perceptible improvement in prepared sizes, which has resulted in larger production of screenings. With many industrial buyers out of the market during inventory, screenings have weakened 75c. and are now at $1@$1.25 a ton.

Many mines that are paying the full union scale are finding it hard to secure business in competition with non-union mines. Some of those who have made private arrangements with labor, are competing with the eastern Kentucky mines which are not unionized and which have reduced prices.

Railroads are not even taking their contract requirements. However, December business was larger than had been anticipated. Some of the mines are taking long contracts because of the uncertainty concerning wages.

Southern Appalachian

SOUTHEASTERN KENTUCKY

Mines Start Cautiously—Oversupply of Labor—Market Still Weak.

While the first week of the year brought little increase in new business over the latter half of December, coal men are more optimistic. Several mines in Harlan and Bell counties that have been closed for thirty days or more are starting up, most of them, however, on reduced output.

In several instances where mines have been down so long, men are needing work badly. One of the larger operations that had been down for some little time had five applicants for every place when starting up on Jan. 2. The 1917 scale of wages is now in effect at practically every mine.

Prices quoted are: Four-inch block, $2.75@$3; egg, $2.25@$2.50; nut and slack, $1.25@$1.35; mine run, $1.65@$1.75.

Middle Appalachian

LOW-VOLATILE FIELDS

Holiday Lull Falls Heavily Over These Fields—Operators Look for Renewed Tidewater Business Soon.

NEW RIVER AND THE GULF

New River mines got production up to about 12,000 tons a day during the latter part of the final week of 1921, but the week's output was the worst of the year. About all that was moving was a little mine run on contract.

Lump brought $3@$3.50 but little was sold. Mine run was $1.60@$1.75. Most of the mines were shut down but there is promise of resuming at lower wages soon. Operators also look forward to a little better Tidewater business.

Operations in Gulf territory stopped during the holidays. However, men here think the accumulation of coal at Tidewater is going down so that movement to the Atlantic piers will soon start. Prices are lump, $3; egg, $2.65; mine run, $1.60.

POCAHONTAS AND TUG RIVER

Pocahontas production was somewhat less than usual during Christmas week. There is no spot business to replace the reduced contract movement and no market for any grade except nut and slack. Quotations are: Slack, $1.25@$1.50; mine run, $1.60@$2; prepared, $3@$3.50. There was a slight improvement in tonnage destined for New England.

Tug River tonnage suffered the usual holiday drop. Most of the mines shut down Dec. 26 and when they opened miners were slow in getting back to work. Market demand is slight. Prices are the same as those in Pocahontas territory.

HIGH-VOLATILE FIELDS

Mine Closings General in Last Week of Year—Spot Market Dormant—Screenings Rise with Scarcity of Supply.

KANAWHA

The final week of the year was discouraging. Production did not exceed 8,500 tons a day. Spot buys were few and even shipments on contracts were cut.. Prepared was in no demand at all. Mine run was quoted as low as $1.25 and lump never brought over $2.50. Nut and slack prices were $1.25@$1.50. Most mines are shut down.

NORTHEASTERN KENTUCKY

With consumers engaged in taking their annual inventory, there was little business in the last week of the year. Not only were contract shipments light but at the same time there was little or no spot demand except for screenings which were not available because of the low production of prepared. This scarcity made for firmer prices, the range being $1.25@$1.50.

LOGAN AND THACKER

Output during the final days of 1921 was low although Logan mines managed to produce 37,000 tons a day. The demand for domestic coal was dormant. Hence the production of nut and slack was limited. Much of the output was shipped to Western markets, Eastern consignments being confined to railroad fuel loadings.

With contract shipments cut down during the holiday week, Williamson operations were more or less limited. There was no sale in the open market nor were the railroads using quite so large a tonnage. No-market losses were still in excess of 150,000 tons per week. Prices did not vary much as compared with those prevailing in other southern West Virginia high-volatile fields.

VIRGINIA

Holiday cessations made for a slight reduction in the output. Shipments on standing orders were not quite so large as usual. There was comparatively little call for spot coal, although producers were receiving a few inquiries for slack. Prices remained about the same with mine run around $2.

News Items From Field and Trade

COLORADO

The management of the **Colorado Collieries Co.** has been blamed by a coroner's jury for the disaster at its Satanic Mine, at Morrison, in which six miners lost their lives. The jury returned a verdict of declaring that the "accident might have been averted by a proper and legal system of ventilation operated by the management of the mine, as provided by law." The miners died from asphyxiation from gases emanating from a fire while they tried to place a bulkhead to seal up the fire zone.

The Monarch Mine is planning the rebuilding of its tipple, recently destroyed by fire.

Notice of a 10 per cent wage cut, effective Jan. 16, was posted by the **Colorado Fuel & Iron Co.** recently at the company's Pueblo steel mills and the Arkansas Valley Conduit, which is the water company supplying the mills. This is the third reduction in a year, and brings the scale to a point 34 per cent below the wartime peak and 65 per cent above pre-war level. Approximately 1,800 men are affected at present. In normal times the mill employs 7,500 men. Coincident with the announcement, company officials gave notice of a 15 per cent reduction in house rents and a reduction in hospital rates. No indication has been given of the attitude of employees regarding the new wage scale.

ILLINOIS

Following is the itinerary for January of the **Illinois Miners' Examining Board**: Decatur, Jan. 5; Danville, Jan. 7; Canton, Jan. 9; Peoria, Jan. 10; Springfield, Jan. 11; Gillespie, Jan. 12; Collinsville, Jan. 13; Coulterville, Jan. 14; Duquoin, Jan. 16; Harrisburg, Jan. 17; Marion, Jan. 18, and Benton, Jan. 19.

The Franklin Machine & Electric Co. is the name of a new company recently organized in West Frankfort. The concern will handle a complete line of mine supplies and will do general machine and electrical work.

E. Hickman, Belleville, now holds the position of mine manager of the **Missouri Illinois Coal Co.**

A. E. Poirot, coal inspector of the Eldnar Coal Co., is now located in Belleville.

Work is progressing rapidly on the sinking of the two shafts of the **Chicago, Wilmington & Franklin Coal Co.'s** mine at West Frankfort. The mine, which will be known as Orient No. 2 will rank in capacity and equipment with Mine No. 1 which at the present time holds the world's record for hoisting coal.

The Paradise Coal & Coke Co., called the mine rescue team out recently to help fight a fire which broke out in the workings at Duquoin. Part of the mine was sealed off in an attempt to smother a former fire but in some manner the fire broke through necessitating help from the outside.

The Franklin Coal Co. has increased its capital stock from $50,000 to $150,000.

Edwin R. Keeler, vice-president of the Taylor Coal Co., has been appointed chairman of the Chicago Association of Commerce, coal sub-division. **Edward Zipf**, president of Zipf Brothers Coal Co., has been appointed vice-chairman.

J. B. Pauley, vice-president of the J. K. Deering Coal Co. is seriously ill at his Chicago home suffering from a fever believed to have been contracted while in Mexico recently.

Two mines at Equality, the **Hickory Hill** and the **West Side** are reported to be shut down and the property in the hands of a receiver. John W. Shaw of Harrisburg has been appointed receiver and is now at the property supervising what work is still being done. The West Side is filling up with water and the company has not been able to keep any pumpmen on the job. According to the report, the men employed have not received any pay for the last three two-weekly pays.

John C. Nusbeck, formerly with the New York Central, has been appointed sales manager for the Atlas Coal & Coke Co., Chicago.

Mine No. 18 of the **By-Products Coal Co.**, at West Frankfort, which is under control of the Peabody interests, was closed down Dec. 20, and no definite time was given by the company as to when the plant would be reopened. This mine is one of the largest and oldest of the Peabody properties and its closing is attributed to the inability of the producers to offer coal on the market at prices approximating those quoted by producers in other coal fields.

The Nason Coal Co., of Chicago, has recently purchased two more large tracts of coal land in Elk Prairie township, near Ina. The company already owns two other tracts in that same location.

W. B. Miller, superintendent of Mine 18 at West Frankfort, has resigned his position after several years of service. He is one of the best known coal men in southern Illinois, having worked for various mining companies throughout Williamson and Jackson counties.

The city of Murphysboro has filed suit against the **Gartside Coal Co.**, of that city for $10,000 damages caused to certain streets in the city. The city alleges that the mine workings have caused a subsidence of paving.

E. L. May, president of the General Coal & Mining Co., Freeburg, is now sales manager for the Fidelity Coal Co., of St. Louis, which has the exclusive sales agency for the General Coal & Mining Co.

The Old Ben Coal Corporation has begun cutting down expenses in the way of closing certain mines in the southern part of the state. Mine No. 12 at Christopher and No. 17 at Johnson City were closed on Dec. 20. It is said that the company might soon shut down others of its twelve mines in Franklin and Williamson counties. It is reported that other operators are now contemplating closing down, some being already forced to do so by the poor market conditions and strong competition from non-union fields.

INDIANA

A deal for the purchase of a 1,620-acre tract of coal land a short distance from Evansville, on the Big Four R.R., by the **Columbia Coal Co.**, is nearly completed. The land is owned by **T. C. Bugg**, secretary and general manager of the Commercial Coal Co. The Columbia company will buy land adjoining the Bugg tracts. The new mine probably will be situated about a mile and one-half east of Buckskin. The Columbia company formerly owned mines in Franklin County, Ill., and now has mining interests at Christopher.

The closing of the operation of the Brazil division, Chicago & Eastern Illinois R.R., will prove a hardship to the **Crawford Coal Co.**, as it has several holdings north of Brazil which will be left without railroad connections. Other mines in the Brazil territory have switches operating from the Big Four. The Brazil Division was originally known as the Chicago & Indiana Coal R.R. and formerly was a large carrier of coal from the Indiana fields to Chicago. The Indiana Public Service Commission is doing everything possible to save the road, and says that injunction proceedings will be instituted if the road is not operated after Dec. 30.

Reassessment by the state board of coal companies in Warrick County is as follows: Big Four Coal Co., Boonville, assessment decreased from $35,000 to $30,000; Bosse Coal & Mining Co. and Bosse Coal Co., Evansville, increased from $82,000 to $100,000; Boonville Mining Co., increased from $59,775 to $65,100; Cypress Creek Coal Co., increased from $98,360 to $106,750; Elberfeld Coal Co., increased from $75,000 to $100,765; Erie Canal Coal Co., Boonville, increased from $80,330 to $84,485; Sargent Coal Co., Newburg, increased from $42,485 to $45,000; Possum Ridge Coal Co., Evansville, increased from $40,000 to $50,000; Warrick Coal Mining Co., Boonville, increased from $97,170 to $107,000; J. Woolley Coal Co., Evansville, decreased from $30,000 to $25,000; Pigeon Creek Coal Co., Boonville, increased from $85,000 to $100,000.

The Division of Geology of the State Department of **Conservation** has prepared a new map of the Indiana coal fields. The outcroppings of the more important veins, together with their approximate locations are shown. The map further shows the Eastern limit of the coal fields in detail together with the outcrops of veins known as Nos. 3, 5 and 7. An insert map of the state shows the area and size of the coal fields with respect to the entire commonwealth. Coal is found in twenty-seven counties in the state in an area of about 7,000 square miles. The map is based on data collected by the geological survey for many years.

KENTUCKY

The Kelse Branch Coal Co., Denver, a few miles from Paintsville, has been chartered with a capital of $25,000, by Paris, Labe and Eliza Polphrey.

The Kentucky Block Coal Co. recently suffered a $20,000 fire loss of its machine shop, head house, two motors, mining machinery, etc., at its plant on First Creek. Incendiarism is suspected.

Following weeks of general depression throughout the east Kentucky coal fields, many of the mines have resumed operations. Among them are the **Consolidated**

Fuel Co., having mines near Daina and Blackey, in the Smoot Creek territory; the **Consolidated Coal Co.** in the Jenkins-McRoberts section and the **Elkhorn Coal Corporation** in the Fleming-Haymond-Hemphill sections.

Prospects for a return of river business are improving. With shipments to the Pittsburg Fuel Co., Louisville, a few days ago representing the first Pittsburg coal arriving by water in eight years, and increased water movement from West Virginia, also some coal from eastern Kentucky via the Kentucky and Ohio Rivers, the situation is looking brighter. One company was formed a few weeks ago to bring coal by water to Louisville, and reload to cars for delivery around Louisville.

NEW YORK

H. L. Harnden, who was connected with Garfield & Proctor Coal Co., New York, has become associated with The Tuttle-Burger Coal Co., Woolworth Bldg. He will look after the bituminous department of the company. Another addition to the Tuttle-Berger Co. is **K. F. Cramer**, of Hartford who has been appointed Connecticut representative. He will also cover part of Massachusetts.

J. B. Roberts, the Buffalo representative of the Nicholson-Smith Coal Co., of Cleveland, has resigned to take the position of sales manager of the Cleveland & Buffalo Coal Co., Buffalo. The Nicholson-Smith Co. will retire. The office has been taken by the Graves Coal & Coke Co., organized recently by Charles E. Graves, for several years manager of the bituminous trade of E. L. Hedstrom.

The United Fuel & Supply Co., Buffalo, a retail concern that formerly did a large business on the co-operative plan, with a considerable number of consumers as stockholders, has gone into voluntary bankruptcy, giving as assets $73,702.41 and as liabilities $57,925.94. The move was precipitated by judgments filed by independent anthracite operators in Wilkes-Barre.

Among charters granted recently was one to **C. W. Proctor** to engage in the coal and wood business in Islip, Long Island, with a capital of $25,000. The other incorporators are given as E. C. Proctor and D. D. White. Mr. Proctor is the president of the Calumet Coal Co. with New York offices at 17 Battery Place.

Lippincott, Mills & Co., Inc., has been granted a New York charter to deal in coal, coke, ores, scrap, iron and steel products and ferro alloys, and to do a general importing and exporting business. The new company has offices at 17 Battery Place, New York and in the Hippodrome Bldg., Cleveland. G. W. Lippincott, head of Lippincott & Co., wholesale coal dealers, Cleveland, is president. William H. Mills, New York, who retired three years ago as president of Naylor & Co., is vice president and treasurer. A. L. Irwin, of Lippincott & Co., Cleveland, is vice president. P. L. Smith, New York, for nineteen years identified with Naylor & Co., resigned to become secretary of the new company.

A petition in bankruptcy has been filed in the United States District Court, New York City against Leander D. Lovell and Frederick C. Sheldon, doing business as **Borden & Lovell**. The creditors and their claims are Sackett Coal Co., $7,500; M. & J. Tracy, $38, and United States Trucking Co., $134. Judge A. N. Hand has appointed Percival Wilds receiver, with a bond of $1,000.

The Wabash Fuel Co., Buffalo, has gone into voluntary bankruptcy. The schedule filed shows liabilities amounting to $70,966 and assets of $41,446. The company did a heavy business in the active bituminous trade of the summer and fall of 1920, but is said to have sold to all sorts of people and carried on business in a loose way generally.

W. B. Watchler, until recently manager of the Chicago district for the industrial bearings division, Hyatt Roller Bearing Co., has been promoted and transferred to the New York headquarters of the division as engineer in charge of general applications.

OHIO

Sales representatives of the **S. J. Patterson Coal Co.**, with offices in Dayton, and one of the largest distributors of Pocahontas coal in the United States, held their annual convention late in December. At a dinner given at the Dayton Country Club, R. D. Patterson made an address in which he outlined the plans of the coming year.

Dexter & Carpenter, Inc., are opening an office at Cincinnati in charge of George M. Carpenter, Jr., formerly associated with the Chesapeake & Ohio Coal & Coke Co., as Western sales manager.

C. A. Albright, of the Albright Coal Co., was named president of the retail coal dealers' board of the Cleveland Chamber of Commerce at the annual election. **F. C. Brown, of Brown Bros. Coal Co.**, was named vice-president; **J. E. Anderson** of the Cuyahoga Coal Co., treasurer, and **F. J. Vasek** was re-elected secretary. All are prominent in Cleveland coal circles and have been in the coal business in Cleveland for many years.

The Lomi Coal Co., Cadiz, owning large stripping operations, has contracted with the Roberts & Schaefer Co. for the complete installation of conveying, tipple and loading equipment.

The Warner Collieries Co., Cleveland has contracted for a complete installation of Marcus steel tipple with loading booms at their new mine at Fairpoint.

OKLAHOMA

In addition to much drilling by the **Central Coal & Coke Co.** to locate coal east and southeast of Centralia, Craig County, there now is to be a general drilling campaign northwest of that place by **S. E. Banzet**, who has just completed the purchase of options on 10,000 acres of prospective coal land. Banzet represents parties interested in the building of a railroad through that section and if coal is found to underlay this land a railroad may be expected to follow the prospecting.

PENNSYLVANIA

In the Johnstown District the old firms are still in existence, but a large number of those establishing themselves in business during the rush have pulled up stakes and are gone. The firms that opened offices in Johnstown during the high price period and which closed during 1921 are: **The Blair Park Coal & Coke Co.; the B. Nicol Co.; Campbell, Peacock & Kinzer Co; Produce Fuel Co.; Swayne & Co.; International Fuel & Iron Co.; Coale & Co.; Butler Coal Co.; Eastern Coal & Coke Co.; M. F. Lersch & Son; Sieler Coal Co.; Knickerbocker Fuel Co.; Wright, Gibson & Co.; Alden Coal Mining Co.** and **Frame, Friend and Stineman.**

The Somerset-Cambria Coal Mining Co., with headquarters in Johnstown, has purchased a tract of 110 acres in Somerset County one mile from Somerset. An option has also been taken on an additional 500-acre tract. The company will centralize operation in one shaft which is located within 200 feet of the main line of the B. & O. railroad. R. H. Speicher is president.

The Flenner Coal Co. at South Fork, has closed its operations indefinitely. The company employed fifty men and supplied the Pennsylvania with coal for the engines on the South Fork branch. The present contract at $2 per ton has expired and the company refuses to pay above $1.75.

The Forks Coal Mining Co. has taken over the operation of the **South Fork Bituminous Coal Co.**, at South Fork and has placed it under the management of R. H. Moore of Portage. The South Fork company operated one mine with 80 men. The Forks company has now three mines and will employ 400 men. The Forks concern operates nine mines in Cambria County, with a total of 1,200 men.

The Lehigh & Wilkes-Barre Coal Co. has sunk a new slope into workings of the Tresckow Mines close to a portion worked out many years ago by primitive mining methods. Although abandoned for almost half a century, the corporation will reopen the section and retimber it.

Three mine officials were seriously burned in a gas explosion in No. 3 slope of the **Susquehanna Collieries Co.** in Newport Township. A pocket of gas was ignited during an inspection tour. The burned men were taken at once to Nanticoke State Hospital.

J. W. Howard, of Clarksburg, having severed his connection with the J. E. Long Coal Co., has become identified with the Thomas N. Mordue Co., with headquarters in Pittsburgh.

An interesting meeting was held in Nanticoke recently relative to a revival of the **Nanticoke Mining Institute**, a conference being held with Mr. Loomis of the State Department of Education, in charge of vocational work in the anthracite region. A syllabus of studies is to be prepared by a committee conferring with Mr. Loomis.

A. J. Musser has been appointed general manager of the Clearfield Bituminous Coal Corporation, with headquarters at Indiana, succeeding **H. B. Douglas**, assigned to other duties.

Fire recently destroyed the tipple at the Tremont Mine of the **Pittsburgh Coal Co.** near Fayette City, entailing a loss of $20,000.

E. J. Myers, representing the Wholesale Coal Co., Pittsburgh, is calling upon the trade formerly visited by **W. B. Sneathen**, who is spending the winter in California.

Alvan Markle, of Hazleton, chairman of the anthracite joint scale committee in 1916 and 1920, sails for Europe at the end of this month as special assistant to the Postmaster General, by appointment of President Harding, to study postal savings systems in Great Britain, France, Italy, Belgium and Holland. He will return some time in February. Mr. Markle was appointed as a representative of Pennsylvania banking interests in the conference on improving the United States postal savings banks, held at Los Angeles, Cal., earlier this year.

The new **Anthracite Mine Cave Commission**—J. B. Smith, Philip R. Bevan and T. H. B. Lyon—visited Harrisburg recently and called upon Attorney-General Alter to get information relative to their powers. As nobody seems to have accepted the Fowler act, under which the commission was constituted, the appointees are in the peculiar situation of holding positions but having no real jobs. Mr. Alter told the members that their work would be necessarily limited until the Supreme Court had passed upon constitutional questions with respect to anthracite legislation, but the commission nevertheless called on the Governor to thank him for the appointments, and later collected a mass of information on anthracite mines at the State Department of Mines.

Business in the Connellsville coke region is declining. The 4,000 ovens fired about a month ago by the **H. C. Frick Coke Co.** are now working only three or four days a week. **W. J. Rainey, Inc.**, has put its ovens at Allison out and is now shipping all coal from that plant. **The Hillman Coal & Coke Co.** has put out ovens at its Isabella plant, shipping all coal and running mostly on river shipments. The river mines of the H. C. Frick company are running full, shipping coal by river to the Clairton byproduct plant of the Carnegie Steel Co.

TENNESSEE

Settlement of the labor trouble in the Knoxville coal district will give temporary work to 12,000 miners and reopen 200 mines in Kentucky and east Tennessee.

The Tennessee Consolidated Coal Co., Palmer, has just completed its revolving dump, at its cross-over tipple, and has also finished the installation of new power-house equipment. It is proposed to bring all the coal from the four openings by motors to one tipple, and when this is done its daily capacity will be from 1,500 to 2,000 tons.

The Tennessee Supreme Court has sustained the decision of Chancellor Garvin of Hamilton County in the case of the Equitable Trust Co. of New York against the **Dayton Coal & Iron Co.**, of Dayton, whereby the chancellor held the stockholders of the company liable for debts aggregating $500,000. The Bank of Scotland in Glasgow, Scotland, is the principal stockholder of the company, hence is liable for the debts.

TEXAS

The Calvert Coal Co., operating a number of mines near Rockdale, is arranging for the opening of a new mine near Bremond, Robertson County, and equipment for this purpose will be installed at an early date. The company has over 1,300 acres of land in this district and plans for extensive operations. J. R. Robinson is manager.

UTAH

Emil Ostlurd, of Castle Gate is now connected with the Utah Fuel Co., in the capacity of mine inspector.

The Salina Coal Co. of Salt Lake City has been authorized by the State Securities Commission to sell $450,000 worth of additional bonds. The company has a capital of $1,000,000.

Joseph Sheya, of Price, has sold 40 acres of coal land on Gordon Creek to the **Great Western Coal Co.** Consideration is $10,000

John Thorpe, of Winter Quarters, is now mine superintendent of the Utah Fuel Co.

Utah coal, coke and iron properties have been merged in a $25,000,000 corporation with **W. E. Creed** of Pittsburgh, of the Columbia Steel Co. and Pacific Gas-Electric Co., as the head.

The Lion Coal Co. of Ogden is to sell its title to two and one-half miles of railroad spur connecting the coal properties at Wattis with the line of the Utah Ry. at Wattis Junction, the purchaser being the latter company. The consideration is $200,000. The line was built during the war and the rails were purchased in Belgium through the efforts of John M. Browning of Ogden, inventor of the Browning pistols.

WASHINGTON, D. C.

Insufficient fuel funds have caused the Navy Department to abandon the joint maneuvers of the Atlantic and Pacific fleet which were scheduled to be held at Panama Bay in February and March. The Department last year asked Congress for 30 million dollars for fuel for the year which began July 1, 1921, but the appropriation was cut to 17½ million dollars and a deficiency of 12½ million dollars was recently refused by the House Appropriations Committee, which insisted that the Navy should keep within Congressional allotments.

The Bureau of Mines announces that tentative recommendations for international standardization of mine rescue and recovery operations in coal mines have been practically completed by a subcommittee of the Mine Rescue Standardization Committee.

Opposition to the decree of the District Court for the Eastern District of Pennsylvania in the disposition of shares of stock of the **Philadelphia & Reading Coal & Iron Co.**, is made by the Continental Insurance Co., and the Fidelity Phenix Fire Insurance Co., of New York, in a brief to the Supreme Court, which will hear this case in January. It is contended by the insurance companies that the disposition of the stock is inequitable to the common stockholders of the Reading.

In the tariff hearings before the Senate Finance Committee opposition was manifested to a duty on Cuban sugar on the ground that it would affect coal exports to Cuba, which are estimated at about $13,000,000 worth of bituminous coal a year.

Sanitary surveys have been made of some of the mining camps in the States of Illinois, Kentucky, California, Arizona and Utah, by the **Bureau of Mines**. Reports calling attention to good and bad sanitary conditions, with specific recommendations for the betterment or correction of the latter, have been forwarded to those most vitally interested, after having been reviewed by engineers and sanitarians in the Washington office.

WEST VIRGINIA

William O'Toole, of Gary, has accepted the post of minister to Paraguay. The new minister is vice-president and general manager of the Central Pocahontas Coal Co. Mr. O'Toole is arranging his affairs with a view to leaving for Paraguay in the near future.

Charleston capitalists have launched the **Stone Cliff Collieries Co.** with general headquarters at Charleston, this concern being capitalized at $50,000. Principal stockholders are C. A. Brockman, Lucy W. Brockman, T. P. Watts, E. H. McNeil and A. S. Guthrie, of Charleston.

Operations are to be conducted in the vicinity of Henry in the Upper Potomac field by the newly organized **Superior Splint Coal Co.**, in which West Virginia and Pennsylvania capitalists are interested and which has a capital stock of $150,000. Leading figures in the new company are McClelland Leonard, George Whyle, Harold Hutchinson, of Uniontown, Pa.; Parley De Berry and O. L. Hall of Clay, W. Va.

All the mines of the **West Virginia-Pittsburgh Coal Co.** in Brook County, have been closed down because the company is unable to compete with non-union mines. For the time being 800 men will be out of employment.

George Wolfe, secretary of the Winding Gulf Operators' Association, accompanied by his wife, spent the Christmas holidays with relatives and friends in Jacksonville, Fla., not returning to the field until the first of the year. He took advantage of the general shutdown of mines to visit a part of the country where he spent his boyhood and which he had not seen for thirty years.

George M. Jones, Herbert Jones and associates of Huntington have purchased the property of the **McGregor Coal Co.**, at Slagle, including 3,500 acres of coal for a price said to approximate $650,000.

A total of 450 acres of coal in the Waynesburg seam on Doll's Run, tapped by the Morgantown & Wheeling, has changed hands, having been secured by the **Alliance Coal Co.**, of Bluefield. The land was sold by David Brewer, Clark and David Lemley, Calvin Morris and others, the deal being made on a royalty basis instead of a cash transaction. Plans are under way to develop the property without delay and to have a mine in operation by spring. The original owners have reserved the rights to the Sewickley and Pittsburgh veins in the tracts sold.

The Tug River Collieries Co. of Williamson has increased its capital stock, under authority of the secretary of state of West Virginia, from $25,000 to $50,000. Permission has been granted by the same official to the **Lindsey Coal Mining Co.** to do business in West Virginia.

C. H. Jenkins, treasurer of the Hutchinson Coal Co. was a visitor in Washington and in Logan the week before Christmas. At Washington he attended a meeting of the Railroad Relations Committee of the National Coal Association.

An injunction has been granted by Judge Lazelle of Monongalia County, enjoining the **Fiedler-Davis Fuel Co.** and Stanley H. Fiedler from distributing and disposing of the property and assets until an action in law by the **Browning Coke Co.** to recover $1,826.29 has been decided. This injunction was granted upon the application of counsel for the Browning company.

J. C. Evans, secretary and sales manager of the Fairmont Mining Machinery Co., has tendered his resignation to become connected with the Huntington Supply & Equipment Co. Mr. Evans will make his headquarters at Bluefield.

Operations have been resumed at the plant of the **Beechwood Coal & Coke Co.**, at Claremont in the New River field after an idleness covering a period of several weeks. Employes petitioned the company and voted to accept a reduced wage.

The Wythe Block Coal Co., of Huntington, with mining operations and mineral land holdings in Webster County, has been thrown into involuntary bankruptcy in Federal court on the petition of the firm of Thomas Rich & Co., Lanesbottom Bank and George R. Morton of Camden. The court granted the petition and has designated George R. Morton to act as receiver.

Glen Rogers is to be the seat of the **Raleigh-Wyoming Coal Co.**, and this will rank as one of the biggest operating companies in the Wyoming County field now undergoing such rapid development. Boston capitalists are largely interested in this company which has spent the last two years in getting its holdings in Raleigh and Wyoming counties ready for development. Shipments will begin as soon as the Virginian completes an extension from its main line at Maben to Glen Rogers. Construction work has been completed on a brick plant with a capacity of 25,000 brick a day and a million dollar power plant is now under construction.

A. J. Salzer of the Southern Coal Corporation of Fairmont was a visitor at Weston a day or so before Christmas.

CANADA

The Dominion Bureau of Statistics has issued a statement giving the output of coal in Canada during 1921 as 14,727,044 net tons, December production being estimated. The output in 1920 was 16,631,954 tons. All the provinces show decreases except British Columbia, the output of which is slightly increased. Alberta heads the list with a figure of 5,763,145 tons, as compared with 6,833,500 tons in 1920, and Nova Scotia's production was 5,580,722 tons, as compared with 6,420,291 tons for 1920.

Traffic News

The I. C. C. has suspended until May 29 proposed reductions in rates on bituminous coal from Kentucky, Tennessee and West Virginia mines on the L. & N. to destinations on the Southern Ry. in Indiana and Illinois.

The commission assigned for hearing at Washington, Jan. 11, the proposed reduction of 5c. per ton on coal from Alabama, Kentucky and Illinois mines to Gulfport, Miss., when for bunkerage, for export, or when for points in Florida and Texas accessible by water, but an increase of 20c. per ton when handled through tipple for other purposes.

The Supreme Court of Ohio, in a recent decision, held that any railroad operated in Ohio, no matter how short a line must be open to everybody's traffic, and ordered the **Dillonvale & Smithfield Railroad Co.**, Jefferson County to cease accepting only shipments of the **United States Coal Co.** The line runs from Dillonvale to Bradley, serving the operations of the United States Coal Co. Bradley is a mining town and the Dillonvale & Smithfield had not in the past furnished service to the general public.

Recent Patents

Drill Sharpener. Edward O. Oldham, Denver, Colo., assignor to Denver Rock Drill Mfg. Co., Denver, Colo., 1,394,214. Oct. 18, 1921. Filed Jan. 7, 1919; serial No. 270,050.

Hopper Car. Mark A. Villiamo, New Castle, Pa., 1,392,371. Oct. 4, 1921. Filed Nov. 3, 1920; serial No. 421,522.

Apparatus for Handling Coal. Charles Williamson, Chicago, Ill., 1,392,382. Oct. 4, 1921. Filed Aug. 9, 1917; serial No. 185,402.

Trade Catalogs

Cadillac Portable Electric Blower—Clements Mfg. Co., Chicago, Ill. Description of small blowers for use in keeping machines free from dust.—Advertiser.

Sullivan Air Lift Pumps—Sullivan Machinery Co., Chicago, Ill. Bulletin 71-G. Pp. 40; 6 x 9 in.; illustrated. Description of the Sullivan Air Lift Pumping System.—Advertiser.

Obituary

Word has been received of the death of **William Alexander McIntosh**, pioneer coal operator and banker in Pittsburg 35 years ago. He died at his cottage on the Gilbert estate at Grims Dyke, Harrow Weald, 10 miles outside of London, in his eighty-fifth year. Old-time Pittsburgers will recall the elder McIntosh as an associate of Andrew Carnegie, William Coleman, John Walker and other pioneers in banking and the coal and steel industries in Pittsburg.

John Holden Thomas, an official of the Philadelphia and Reading Coal & Iron Co., dropped dead recently near Wiconisco. He is survived by five sons and three daughters.

Coming Meetings

American Wood Preservers' Association will hold its annual meeting on Jan. 24, 25 and 26 at the Hotel Sherman, Chicago, Ill. Secretary, G. M. Hunt, Madison, Wis.

American Institute of Electrical Engineers will hold its midwinter convention in New York City, Feb. 15, 16 and 17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Institute of Mining and Metallurgical Engineers will meet on Feb. 20 to 23 in New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

The American Institute of Consulting Engineers, Inc., will hold its annual meeting Jan. 16, 1922, at the Engineers' Club, 32 West 40th St., New York City. Secretary F. A. Mollitor, 35 Nassau St., New York City.

Southern Appalachian Coal Operators' Association will hold its next meeting Jan. 27, 1922, at Knoxville, Tenn. Secretary, J. E. McCoy, Knoxville, Tenn.

Pittsburgh Vein Operators' Association of Ohio will hold its annual meeting on Feb. 13, 1922, at Cleveland, Ohio; D. F. Hurd, secretary.

Tug River Coal Operators Association will hold its annual meeting at Welch, W. Va., on Jan. 18, 1922. Secretary, C. C. Morfit, Welch.

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C. E. LESHER, *Editor*

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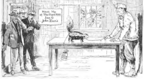
Coal on Verge of Upturn in Country's Business Cycle

Industry Hits Bottom—Recovery Will Be Gradual but Unhampered —Railroads Getting on Their Feet, Public Utilities Continue Strong, and Iron and Steel on Mend—Coal Output Will Improve This Year

PROPHECY is hazardous, yet today every business man must attempt it. The beginning of a new year is by custom a time of retrospect and prospect. Industry is now adding up inventories, offsetting assets against liabilities, and taking a fresh grasp of the helm for 1922.

The coal industry, having suffered the travail of 1921, faces the new year with hope and expectancy, fully aware of the hazards that lie ahead. Real prosperity for it always is a consequence of general prosperity. Since 30 to 40 per cent of anthracite and 80 per cent of bituminous coal are used by industry and transportation, it is obvious that the coal trade will flourish only as its customers are busy and in need of fuel. Essential then as a first step in our contemplation of 1922 is a survey of the present condition and the future expectations of the business of our customers.

First, a word about our position in the business "cycle." Progress on the upturn and at the top of a cycle connotes prosperity. We had that prosperity in 1919 and in the first part of 1920. The breaking point, which always marks a crisis, was reached in the last half of 1920. The downgrade which followed—falling prices, business failures, deflation, unemployment—marks a period of depression. Admittedly we are in that period now. But production in many lines is improving, markets are stabilizing, and conditions, especially among raw and basic materials, are growing steadily healthier. We are moving warily forward, peering hopefully ahead for, and almost discerning, the business revival that is sure to appear. We will not be fooled by any false prosperity, however. Indications



Miners' Union: "Don't be afraid of Puss. She never hurt anyone."
Operators: "You'll have to throw that animal out before we will talk business."

must be absolute before we will believe that good times have returned. In other words, while the country remains psychologically in depression, physically it is already on the upturn. The year 1922 will be marked by a gradual recovery unattended by relapse or boom, either of which would be damaging. We are on our way, though no one can say how long it will take to reach the point where industry may again be reported busy and buying coal.

The literature of the new year bears abundant testimony to the truth of the old adage that "hope springs eternal in the human breast." At the beginning of 1922 there seems to be a conspiracy against pessimism in the writings of the perennial reviewers. Many signs of recovery lead financiers, business men and economists to predict improvement and to assert that business is making progress in the "positive phase of the cycle."

Herbert Hoover summarizes the situation by saying that "Our year of liquidation is over and we can look forward to a year of recuperation. Except for the seasonal dip of the winter we should have a continuous lessening of unemployment and an increasing betterment in the agricultural situation. We have passed through the most precipitous price drop in our history—a drop averaging nearly 50 per cent and necessitating the writing of something over $20,000,000,000 off our books as a nation during 1921. We have gotten through the credit strain that has been involved in this violent writing down of national inventories; we have absorbed the enormous surplus of goods carried over from the post-war boom; we are on much sounder foundations."

Railroads, the largest coal consumers, are in the throes of readjustment. Wages of railroad labor and freight rates must be reduced yet farther and traffic must increase before the companies come into the market for the vast quantities of supplies and equipment they so urgently need. Engine-fuel consumption, the backbone of the steam coal trade, was below par in 1921; it will be better in 1922 as the year progresses. Public utilities and central power stations have been the most consistent consumers of coal of any large users. The anticipated growth of the power business insures a continuance of this market for steam coal.

The iron and steel industry is on the mend. The low point in pig-iron output was reached in midsummer, since which time the swing has been consistently upward. The most optimistic, however, do not expect a rapid rise in the demand for iron and steel products or a return to anything like capacity output until large construction again begins, which may not be in 1922. As this industry consumes about 20 per cent of the coal produced, either as coal or as coke, this forecast is of deep import to the coal producers. Until the iron and steel industry is again operating somewhere near the 1916-1920 rate, the figure of 500,000,000 tons of bituminous coal in a year will not easily be attained.

Foreign business off shore in coal practically vanished in 1921. The winning back of a normal fair share of the world's export coal trade will be slowly accomplished, but there will be no such increments to production in 1922 as in 1920 on this account.

Production of bituminous coal and anthracite in 1921 was nearly 499,000,000 tons, a decrease of 146,400,000 net tons, or 22.6 per cent, from 1920. This was the lowest record in nine years, or since 1911. We are confident that it represents a low mark and that both 1922 and 1923 will exceed 1921 in tonnage.

In point of quality output the coal industry fared better than the average of all business in the country. Prices and profits, however, were depressed below tonnage and the year was a trying one for the union fields, for owners, operators and mine labor alike. The shaking down from the opulent times which began in the autumn of 1916 and ended four years later is having a wholesome effect on the industry. It induced better methods of mining, greater use of marketing, more consistent and intelligent marketing, and forced a fuller realization of responsibility toward the public. Also it promoted better co-operation within the industry and tended to weed out the weaker, superfluous element from the trade.

The brighter prospect of 1922 does not shine uniformly on the coal industry, for the dark cloud of labor trouble hangs over more than two-thirds of the fields. Looking in one direction a better, more prosperous year is plainly discernible for the non-union operators. Looking in the other direction, at those under the shadow, the best that can be said is that only when the issue of union labor dominance is settled can unionized territory feel the stimulus of the better times.

Production of Bituminous Coal by Months, 1921*

	January	February	March	April	May	June	July	August	September	October	November	Year to to Nov. 30
Alabama	1,338,000	1,068,000	995,000	900,000	910,000	950,000	870,000	1,005,000	1,045,000	1,235,000	1,120,000	11,436,000
Arkansas	157,000	119,000	120,000	111,000	129,000	144,000	147,000	157,000	152,000	190,000	123,000	1,549,000
Colorado	1,054,000	747,000	618,000	643,000	674,000	548,000	663,000a	777,000	862,000	900,000	998,000	8,484,000
Illinois	7,074,000	5,313,000	5,100,000	4,580,000	5,080,000	4,939,000	4,841,000	6,196,000	6,325,000	8,100,000	6,115,000	63,610,000
Indiana	2,243,000	1,834,000	1,720,000	1,240,000	1,425,000	1,430,000	1,360,000	1,720,000	1,750,000	2,250,000	1,689,000	18,661,000
Iowa	610,000	506,000	489,000	417,000	387,000	371,000	354,000	456,000	483,000	644,000	555,000	5,272,000
Kansas	508,000	399,000	389,000	382,000	363,000	373,000	396,000	426,000	433,000	438,000	120,000	3,849,000
Kentucky	2,568,000	2,028,000	2,100,000	2,053,000	2,489,000	2,659,000	2,311,000	2,562,000	2,601,000	3,049,000	2,600,000	27,220,000
Maryland	231,000	228,000	207,000	189,000	188,000	180,000	158,000	162,000	157,000	184,000	124,000	2,008,000
Michigan	125,000	98,000	80,000	72,000	73,000	84,000	77,000	102,000	94,000	116,000	107,000	1,028,000
Missouri	433,000	310,000	320,000	287,000	312,000	325,000	319,000	332,000	350,000	428,000	341,000	3,757,000
Montana	279,000	283,000	274,000	211,000	202,000	194,000	226,000	307,000	351,000	404,000	379,000	3,110,000
New Mexico	262,000	203,000	204,000	197,000	175,000	173,000	192,000	189,000	188,000	184,000	169,000	2,136,000
North Dakota	56,000	54,000	53,000	35,000	32,000	33,000	35,000	50,000	63,000	77,000	92,000	580,000
Ohio	2,963,000	2,232,000	2,335,000	2,098,000	2,742,000	2,822,000	2,615,000	2,868,000	2,715,000	3,524,000	2,741,000	29,655,000
Oklahoma	230,000	173,000	168,000	182,000	177,000	188,000	198,000	235,000	221,000	262,000	205,000	2,239,000
Pennsylvania	11,465,000	8,930,000	8,620,000	7,124,000	9,576,000	9,593,000	8,175,000a	9,158,000	9,161,000	11,786,000	10,225,000	103,991,000
Tennessee	454,000	371,000	357,000	328,000	363,000	379,000	330,000	387,000	395,000	482,000	403,000	4,249,000
Texas	102,000	81,000	83,000	76,000	95,000	89,000	96,000	84,000	74,000	80,000	65,000	925,000
Utah	397,000	309,000	257,000	234,000	259,000a	220,000	267,000	412,000	442,000	428,000	353,000	3,631,000
Virginia	518,000	408,000	378,000	3,883,000	417,000	404,000	385,000	389,000	445,000	548,000	494,000	4,769,000
Washington	270,000	244,000	265,000	169,000	180,000	172,000	172,000	191,000	231,000	284,000	275,000	2,453,000
West Virginia	6,229,000	4,307,000	4,670,000	5,091,000	6,581,000	7,117,000	5,659,000	5,654,000	5,796,000	7,141,000	5,917,000	64,162,000
Wyoming	694,000	598,000	576,000	540,000	493,000	500,000	529,000	709,000	784,000	991,000	802,000	7,216,000
Other States†	10,000	8,000	14,000	11,000	8,000	9,000	10,000	10,000	9,000	8,000	8,000	105,000
Total bituminous	40,270,000	30,851,000	30,392,000	27,553,000	33,330,000	33,896,000	30,385,000	34,538,000	35,127,000	43,733,000	36,020,000	376,095,000
Anthracite	7,410,000	7,701,000	7,406,000	7,703,000	7,497,000	7,786,000	7,050,000	7,196,000	7,124,000	7,580,000		

*Estimates of the United States Geological Survey.

†Includes California, Georgia, Idaho, Arizona and South Dakota.

Coal Production Equalled by Few Other Industries

Basic Character of This Fuel Proved When Anthracite Grazes 1920 Output and Bituminous Falls Only 27 Per Cent Short, Despite Depression—Some Union Mines Prostrate While Non-Union Set High-Water Marks

THE 1921 production record of American coal is equalled by few industries except the railroads in the ton mileage they handled. Pennsylvania anthracite fields came within a million and a half tons of that substantial mining year 1920, while the country's soft-coal output fell but 27 per cent short—an estimated 407,000,000 tons as compared with 556,000,000 tons. Even the record-breaking 1918 exceeded 1921 by only 30 per cent. Although 1911, with 405,907,000 tons, was the worst recent year surpassed by 1921, yet the 1921 performance is so satisfactory in the face of the general and extreme business depression that it clearly demonstrates the basic character of coal.

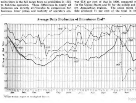
Considered in broad geographic subdivisions we find some variations from the general production average for bituminous coal. The largest producing area, commonly described as the middle and northern Appalachian region and comprising the fields in Ohio and Pennsylvania extending south to West Virginia and eastern Kentucky, produced 73 per cent of the 1920 output. The highest ratio was recorded in Illinois, Indiana and western Kentucky, where 1921 was 75.5 per cent of 1920. The Rocky Mountain region recorded 73 per cent, and Washington 72.3. The Missouri Valley region, made up of the coal fields from North Dakota to Texas, showed in 1921 an output 65 per cent of 1920.

In finer detail, however, there is a wide and discouraging disparity between the degrees of activity of individual districts, and as between single operating units there is the full range from no production in 1921 to full-time operation. These differences in nearly all instances are directly attributable to competition for business, lower prices and inability of operators employing union labor under contracts for higher wages to meet the selling prices of those employing non-union labor, whose wages were reduced during the year. The important exception, of course, was the anthracite region, where, although wages and prices were the highest on record, practically full-time operation was enjoyed. Until there shall be a substitute for anthracite for household use, demand for this fuel will not be seriously affected by price.

Union soft-coal districts in the northern and central Appalachian region—namely, central Pennsylvania, Pittsburgh, all of Ohio, Fairmont, Maryland, Kanawha and New River—suffered severe reductions in output as a result of the competition of neighboring non-union districts in the same region. Somerset, Connellsville, Logan, Winding Gulf and the fields along the Norfolk & Western, the high-volatile Kenova-Thacker field and Pocahontas, eastern Kentucky, and Virginia made up what the union districts lost, thereby bringing the record for the year for the region as a whole to 73 per cent of 1920. In other words, although the demand for coal from the markets reached by this large producing area was eminently satisfactory in view of the greatly depressed status of industry generally, the division of the trade was far from equitable. In some instances union mines were prostrate while non-union mines recorded the best year in their history.

Central Pennsylvania was one of the hardest hit of the union fields. Production in this district in 1921 was 67.6 per cent of that in 1920, compared with 73 for the United States and 73 for the middle and northern Appalachian regions. The union mines in this field produced 71 per cent of the total in 1920, or

Average Daily Production of Bituminous Coal*



*From Weekly Report of Geological Survey.

41,502,415 tons, and the non-union mines produced 29 per cent, or 16,870,000 tons. In 1921 the union mines produced 62 per cent of the total production, or 24,366,000 tons, while the non-union mines produced 38 per cent, or 14,934,000 tons.

If the union mines had maintained their percentage, their production for 1921 would have been 27,903,000 tons, which was 3,537,000 tons more than they did produce. The non-union mines in 1921 did 89 per cent of their 1920 production, whereas the union mines did but 59 per cent. Union mines bore the loss in production in this field in 1921.

Diagrams portraying percentage of full-time operation and the causes limiting production in each field are reproduced throughout this issue of COAL AGE. The data are taken from the weekly reports of the Geological Survey and reproduced through the courtesy of the Bureau of Coal Economics of the National Coal Association. These pictures show more strikingly than words the advantages to some and the disadvantages to others of unstabilized wages and costs. The producer with a high cost consequent on high wages cannot sell his product, neither can the union miner demanding high wages sell his labor, as against other coal and labor at lower prices.

Alabama and Tennessee, although largely non-union, made no better showing than they did in 1920. This was principally because Alabama, the larger producer, depends on a circumscribed market of which the depressed Southern iron and steel industry is the largest consumer, and this business was as depressed in the South in 1921 as elsewhere in the United States. It was not until the end of 1921 that operators in Tennessee having agreements with union miners reduced wages and were thus able to compete for a share of the going business. The important railroad fuel demand, the mainstay of the Southern fields, after iron and steel, was fair in 1921, but not sufficient to counteract the other depressing influences.

Two factors, railroad fuel and domestic business, sustained Illinois, Indiana and western Kentucky fields and permitted a record of 75.5 per cent of 1920, the best year, bar none, these fields as a whole ever enjoyed. In 1918 more than 60 per cent of the output of Illinois was shipped to railroads and retail dealers and more than 50 per cent of the output from the mines in Indiana went to the same markets. The retail trade was pursued by operators in these fields with particular vigor in 1921.

In recent years the output of Illinois has been approximately one-quarter mine-run, one-quarter screenings and the remaining half lump, egg and nut. That is, for each ton of fine coal, two tons of prepared coal were produced. In pre-war years there was little demand for prepared sizes in the summer months and therefore screenings, a resultant product, usually were scarce. During the autumn and winter as householders and, in turn, retailers bought the domestic sizes, the byproduct screenings became overabundant.

In 1921 conditions were quite reversed. So hard did the operators push the sale of their domestic coal, so energetically did they promote the distribution of prepared coal during the summer of 1921, that on June 30 there were no less than 500,000 tons of unsold screenings either on the ground at the mines in Illinois or in unbilled cars on mine tracks. This half million tons of fine coal resulted from the production of 1,000,000 tons of prepared coal that was distributed currently.

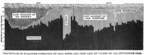
By Nov. 1 the steam market had absorbed this surplus of fine coal and thereafter screenings were in shorter supply and commanded a better price than domestic sizes. The autumn and winter market for household coal was supplied in 1921 by summer production.

Despite the distance of Chicago and Midwest markets from the non-union fields of eastern Kentucky and southern West Virginia, coals from these fields was poured into the West in the latter half of 1921 at a rate and at prices low enough to attract business away from the home districts—business that had been enjoyed for several years while smokeless coal, for instance, had been diverted into the foreign markets.

Coal fields west of the Mississippi River in Iowa, the Southwest, Texas and North Dakota in 1921 recorded a decrease of 35 per cent from 1920, lack of demand, strikes in Kansas and the competition of fuel oil and coal from east of the Mississippi River accounting for the loss.

The Rocky Mountain region in 1921 recorded 78 per cent of its 1920 output. Here, as in the producing fields lying immediately to the east, domestic and railroad demand is the backbone of the trade, and these were less depressed than the local industrials, which in this region are base metal smelters and the beet-sugar refiners. The principal cause of the decrease of 28 per cent in Washington was labor trouble.

From the beginning of the year to the end of March the rate of production of bituminous coal steadily de-



PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES OF ALL BITUMINOUS COAL MINES IN UNITED STATES, 1919 AND 1920 clined, making the low point of the year in the first week of April. In April and May there was a gradual recovery to a level somewhat below that in the corresponding period of 1919. Throughout the summer and early autumn the rate was variable, but within narrow limits. September and October recorded a rise in the rate of production that culminated in a peak the last half of October, when the general railroad strike threatened. A steady drop through November brought output to the lowest level for December of any year within the past ten, save that during the first half of December, 1919, when the miners were on strike.

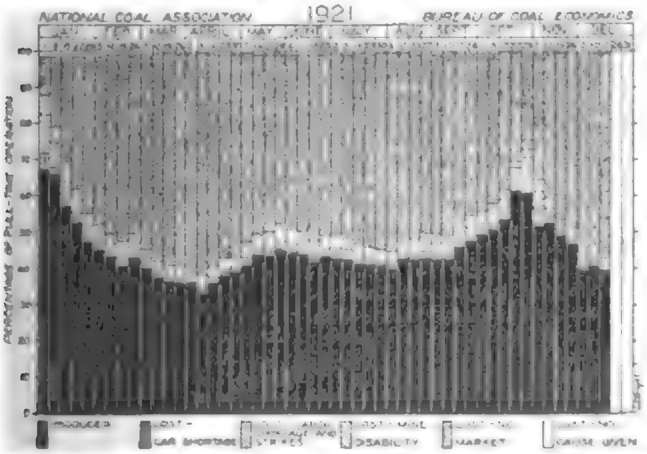
Bituminous Production in 1921 a True Index of Demand

Car Shortage and Labor Trouble Cut Little Figure—Consumption and Stocks Waver in Unison—Increasing Amount of Coal Used as Year Waned—Mines Must Maintain November Output Rate to Meet Nation's Winter Needs

ABSENCE during 1921 of car shortage and labor troubles as factors limiting output of bituminous coal made the rate of production a true index of demand. Both consumption and stocks of bituminous coal in the hands of consumers fluctuated in unison in 1921, though the changes were not proportionate. The first four months, January to April inclusive, were marked by a sharp drop in the rate of consumption of soft coal, from an estimated figure of 42,000,000 tons per month in October, 1920, to around 27,500,000 tons in April. The drop in consumption was reflected, of course, in a corresponding but even steeper decline in demand and consequently in production. In this period extreme uncertainty respecting coal requirements prevailed among consumers and storage coal was freely drawn upon. As a result total supplies dropped from nearly 46,000,000 tons on Jan. 1 to 38,000,000 tons on May 1.

Consumption Turned Upward in May

The evidence afforded by the statistics of production and stock clearly shows an upturn in the rate of consumption beginning with May, ascending rather rapidly until October and continuing upward at a lower angle in the last quarter of the year. Commodity loading on the railroads, railroad fuel consumption, certain lines of industrial activity such as were noticeable in paper and automobile tires, and the seasonal requirements of the country for coal all point to the correctness of this interpretation. On the other hand the rate of production of pig iron, usually considered a reliable index of both industrial activity and soft-coal consumption, marked its lowest point in July and August. This was some three months later than the low point in coal consumption as shown in the accompanying diagram.



PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES OF ALL BITUMINOUS COAL MINES IN UNITED STATES, 1921

In the five months, May to September, the demand was in excess of consumption each month save July, showing a gain in consumers' storage. By Oct. 1 stocks had climbed back from the low point of April to 42,000,000 tons. The threat of a railroad strike Nov. 1 induced heavy buying of coal during October, production exceeding estimated consumption by more than 5,000,000 tons, so that on Nov. 1, according to the estimates of the Geological Survey, consumers' stocks of soft coal were more than 47,000,000 tons, topping the Jan. 1 figure by nearly 1,500,000 tons and representing a gain over April of more than 9,000,000 tons.

In the reaction that followed the removal of the strike threat, demand fell rapidly. In November production was slightly less than consumption and in December it failed by more than 6,000,000 tons of meeting actual requirements. The year 1921 therefore closed with nearly 5,000,000 tons less bituminous coal in consumer storage than when it began—that is, consumption of bituminous coal in 1921 was 5,000,000 in excess of production, the difference representing deflation of stocks.

Consumer Better Off at End of Year

While the year closed with fewer tons of coal in storage than when it opened, the consumer really was somewhat better off at the end than at the beginning, because of the reduced rate of consumption. At the going rate, 45,800,000 tons of reserve coal represented 34 days' supply, whereas 40,800,000 of reserve on Dec. 31 represented 35 days' supply.

The history of the past six years, shown graphically in the accompanying diagram, indicates clearly that five weeks', or 35 days', average stocks of bituminous coal for all classes of consumer in the country as a whole is the minimum below which there develops sufficient urgent demand to create an upturn in prices and, depending on the degree of depletion of reserves, a coal buyers' panic.

Looking ahead then it may be suggested that, with no change in consumption in the first quarter of 1922 from that obtaining in the last quarter of 1921, the rate of production must average that of last November—that is, allowing for no gain over the going rate of exports, not less than 36,500,000 tons per month. This at least is required to maintain stocks at their present level, but it will not provide sufficient storage against a prolonged miners' strike in April and possibly during succeeding months.

How demand has fluctuated over the past three years is strikingly shown in the accompanying composite diagrams of percentages of full-time operation and time lost by causes at bituminous coal mines in the

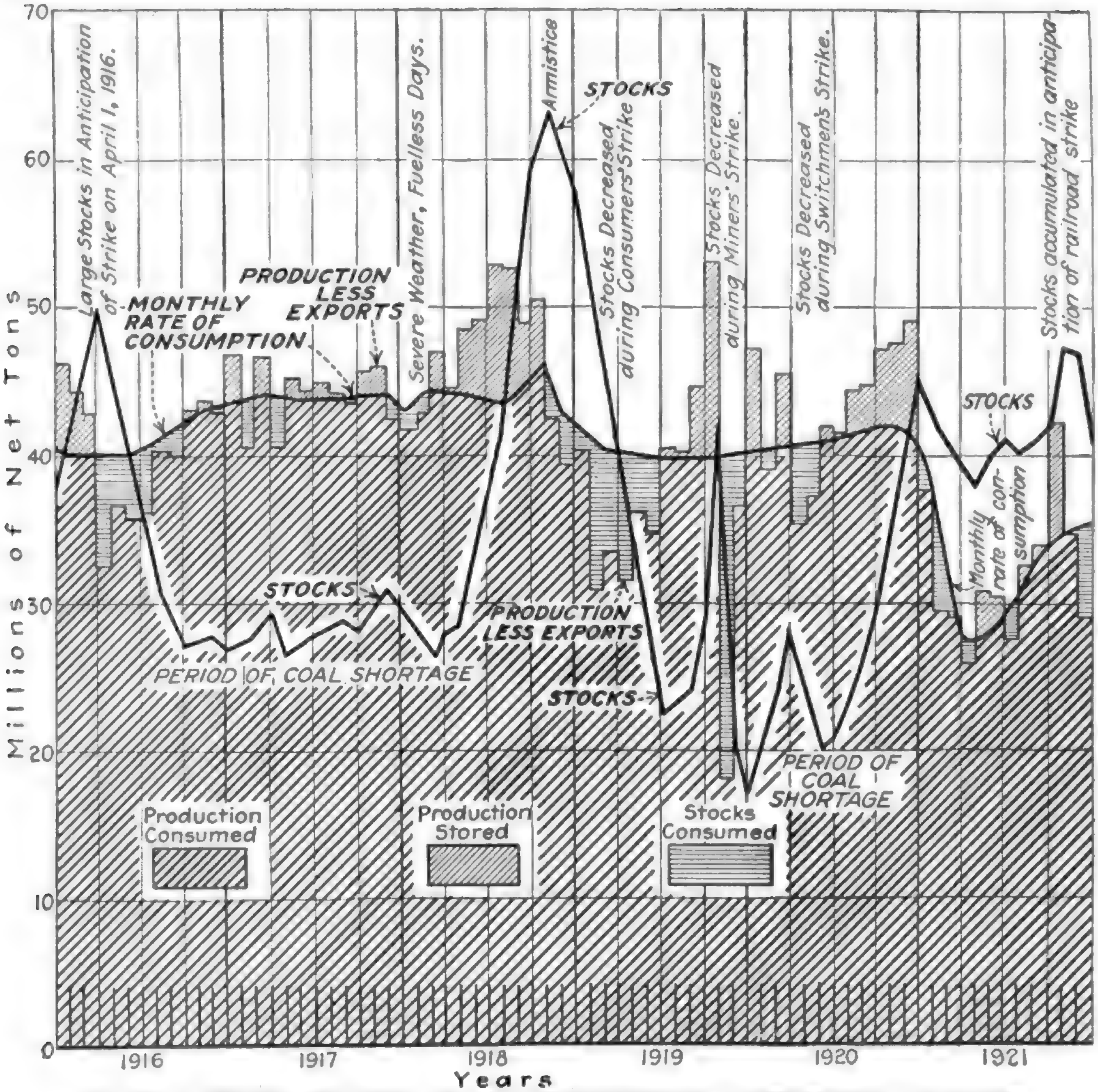


DIAGRAM SHOWING RELATION OF AVAILABLE PRODUCTION, CONSUPMTION AND STOCKS OF BITUMINOUS COAL IN THE UNITED STATES, 1916-1921

The data from which this diagram has been constructed are taken from official reports of the U. S. Geological Survey. The line of production less export is the monthly record of production of bituminous coal, from which has been subtracted export less import. The result is production available for consumption or storage within the United States. Crossing the diagram in a somewhat irregular manner is a heavy line representing consumption.

It will be noted that consumption increased nearly 10 per cent at the end of 1916 over the rate in the early part of that year, and that this rate of consumption was maintained until shortly before the armistice.

Consumption of bituminous coal reached its lowest point in the six years covered by this diagram in the second quarter of 1921. The precipitateness and depth of the business depression are fully disclosed by the drop in the rate of consumption of coal from 42,000.00 tons a month in October, 1920, to 27,000,000 tons in April, 1921. Production of coal, however, declined faster than consumption, with the result that stocks dropped from nearly 46,000,000 tons Jan. 1, 1921, to 38,000,000 tons by May 1. The draft on stocks in the first four months of 1921 was 8,000,000 tons.

From May to the end of October consumers added to their storage piles each month with the exception of July. By Oct. 1 the net gain in stocks was nearly 4,000,000 tons. In October, in anticipation of a nation-wide railroad strike, heavy purchases of coal added 5,000,000 tons more to the consumers' stocks, bringing the total to more than 47,000,000 tons. Consumption meantime had increased month by month from the low point of 27,000,000 tons in April to more than 35,000,000 tons at the end of the year. Production in November was slightly below consumption and in December was 6,000,000 tons less than was burned, with a resultant decrease in stocks to approximately 41,000,000 tons on Jan. 1, 1922.

Every period in which stocks in the hands of consumers has dropped below the current month of consumption has recorded a coal shortage and high prices. It is evident, therefore, that unless consumption in the early months of 1922 shall be sharply curtailed (and of this there is no indication, but rather the reverse) another month with demand as restricted as in December, 1921, will reduce stocks to a point below which lies trouble. Assuming a rate of consumption of soft coal in the first quarter of 1922 of but 35,000,000 tons per month, and of exports as 1,000,000 gross tons per month, and further assuming that, in view of a possible mine strike on April 1, it is positively unsafe to approach the end of March with less than five weeks' stocks in the hands of consumers, it is patent that production in the first thirteen weeks of 1922 must average 8,600,000 net tons per week. From early in 1919 the rate of consumption increased to a maximum in the post war period in October, 1920. The coal shortage of 1920 was overcome when stocks were accumulated in excess of an average of four weeks' supply.

United States. In 1919, in the post-armistice slump, "no market" was the predominating cause of non-operation of the soft-coal mines. In November and December of that year the miners' strike cut the percentage of full-time operation to the lowest point in many years. The boom that followed is illustrated in the upward trend of the "percentage of operation" portion of the diagrams. Car shortage as a limiting factor was at its height in 1920, but in 1921 the "spotted" area of time lost because of no market again becomes prominent.

Price of Bituminous Coal in 1921 Lowest Since 1916

Spot Prices Average $2.55 for Entire Year, 100 Per Cent Over Pre-War Level, but Drop to 76 Per Cent in December—Average Realization at Mines Estimated at $2.35—Coal Costs on Their Way Down

PRICES to the consumer and buyer, and profit to the producer and seller—taken by and large, neither was satisfactory in 1921. The consumer is convinced that his coal cost him too much. He wants to know what this year's prices will be. The operator has no doubt about his lack of profits. He is now feverishly concerned with reducing expenses so as to exact some profit on business in a market so competitive that a few cents a ton determines a sale. It is pertinent therefore to turn back over the past year and beyond to pre-war years and refresh our memories on the history of coal prices.

The accompanying diagram shows the relative average spot price of fourteen standard bituminous coals weighted in accordance with their normal production. Relative to the pre-war average, the spot price of these coals st od at the end of 1921 at 176, that is, 76 per cent above the pre-war base.

For the year as a whole the relative was 201, corresponding to a weighted average price of $2.55 per net ton, or 101 per cent over the base. This is the lowest figure since 1916, when the average price of the same coals was $1.85, or 46 per cent above the base. In the nine years covered by this price study 1915 was the lowest, with an average price of $1.12, which was 12 per cent below the base. The peak was reached in 1920, with an average for the year of $5.64 (including three months at government prices), or 344 per cent above the average. The highest month was August, 1920, with an average price of $9.51, which was 649 per cent over the pre-war base.

How non-union coal prices left the union coals behind in the toboggan slide in 1921 is illustrated in the tables and diagrams of separate coals in the pages following. This and the constant depression of all prices throughout the year are the points to be particularly noted.

However, because the non-union fields were more active than the union, and their prices were lower, the actual realization on total sales was below the average spot price of $2.55 noted as having been derived by weighting prices in accordance with normal output. The average realization on bituminous coal at the mine, both contract and spot, has been estimated at $3.50 per net ton for 1920. For 1921 this figure will not exceed $2.35. In 1922 it will be even lower.

Prices are continually being pressed downward. Between now and April 1 there will be more wage reductions, some in the non-union fields, some in the less strongly organized union districts. The average for the country, however, will not be materially affected by these changes. The next substantial decline in prices will come after the present wage contract with the United Mine Workers expires on March 31. It is expected that at or about the same time freight rates will be reduced, thereby making the cost of coal to the consumer even yet lower.

It is interesting to compare the annual average of spot prices as reported weekly in COAL AGE over the years 1913 to 1921 with the average realization for all bituminous coal in the United States as reported by the Geological Survey. The figure from the Survey is the total dollars received by all operators divided by tons sold and is therefore a comprehensive reliable figure. This comparison is made in the following table:

Year	Average Spot Price	Average Realized Price
1913	1.23	1.18
1914	1.14	1.17
1915	1.12	1.13
1916	1.85	1.32
1917	3.25	2.26
1918	2.58	2.58
1919	2.59	2.49
1920	5.64	3.50(a)
1921	2.55	2.35(a)

(a) Estimated.

It will be noted that in every year save 1914 and 1915 the price realized was lower than the spot price, and that the better business conditions were, the wider the spread between these two figures. The year 1914, which differs from the others in this respect, was the year of depression following a boom. Contract prices on a falling market are above the spot price level and although in such a year more than the normal proportion of the output is traded in the spot market, the effect is an average return above the open market. Although the average cost of production of bituminous coal was no greater in 1915 than in 1914, and probably was less because the tonnage was greater by nearly 5 per cent, the average realization declined by 4c, or 3.4 per cent.

Coal Produced in the United States, by Groups of States

	1916	1917	1918	1919	1920	1921	Ratio 1921 to 1920	Decrease 1921 from 1920 Tons	Decrease 1921 from 1920 Per Cent
Pennsylvania, Maryland, West Virginia, Virginia, Eastern Kentucky, Ohio and Michigan	324,493	333,416	351,365	300,420	331,510	241,896	73.0	89,614	27.0
Tennessee, Alabama	24,223	26,262	26,083	20,803	23,500	17,020	72.4	6,480	27.6
Illinois, Indiana, Western Kentucky	94,110	122,976	130,768	90,407	130,800	98,707	75.5	32,093	24.5
North Dakota, South Dakota, Iowa, Missouri, Kansas, Oklahoma, Arkansas and Texas	27,119	31,507	30,724	21,741	29,930	19,447	65.0	10,483	35.0
Colorado, Montana, Wyoming, Utah and New Mexico	29,388	33,411	36,258	29,281	37,356	27,243	73.0	10,113	27.2
Washington	3,039	4,010	4,082	3,100	3,324	2,400	72.3	924	27.8
Total bituminous	502,282	551,582	579,281	565,752	556,420	406,963	73.2	149,457	26.8
Anthracite	87,578	99,612	98,826	88,100	89,100	87,500	98.0	1,600	18.0

In other words, tons produced dropped for one year after the 1913 boom but prices dropped for two years.

It would appear, then, that in 1921, the first year of depression after 1920, the average price realized would have been above the average spot price. This probably would have been true had it not been for lowering costs in all non-union fields and the disproportionate tonnage from these fields. We estimate, therefore, that the Survey's figure of average realization in 1921, when available, will be around $2.35 per net ton.

An indication of the course of prices in recent years, or since early in 1919, is found in the monthly summaries of costs of railroad fuel prepared by the Bureau of Statistics of the Interstate Commerce Commission. As these figures cover delivered costs and include freight where incurred, they are of course not truly representative of mine prices. The first month for which the figures are available is March, 1919, which shows an average cost of $3.45 per net ton on 8,109,000 tons of fuel coal, used by locomotives in road service. The cost declined to $3.25 in May and rose steadily to $4.80 in the last quarter of 1919. In the first quarter of 1920 the delivered cost was around $3.60 per ton, rising to $4 by November. The increase in freight rates in August, 1920, is masked in the returns by the decline in coal prices that began the same month, but is evident in the returns for 1921 which cover in part coal bought in 1920.

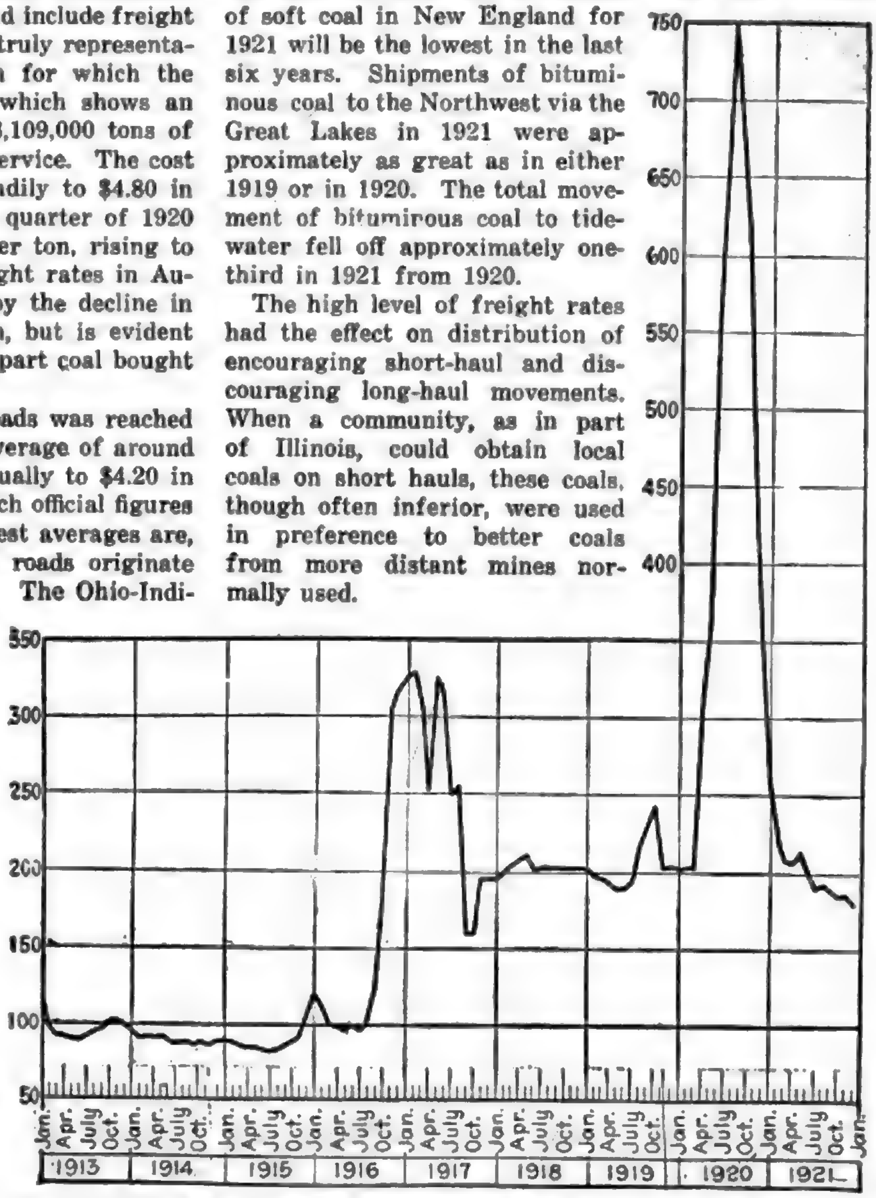
The peak in coal costs for the railroads was reached in the first quarter of 1921, with an average of around $4.60 per net ton. This declined gradually to $4.20 in October, 1921, the latest month for which official figures are available at this writing. The lowest averages are, of course, in those regions where the roads originate the greater portion of their fuel coal. The Ohio-Indiana-Allegheny, the Pocahontas and the Central Western regions are of this character. Here coal costs in February, 1921, were $4.34, $4.88 and $3.93 respectively. In October, 1921, the regions reported $3.74, $3.78 and $3.76. The cost of railroad coal is headed downward and will decline yet more when freight rates are reduced.

Freaks of Distribution Characterized 1921

A YEAR with as little respect for the precedent as 1921 was certain to produce freaks in distribution as it did in production, price and consumption. Southwest Virginia coal via Hampton Roads and southern Appalachian coal via Charleston in New York harbor, Smokeless coal from southern West Virginia in Three Rivers, Quebec, by ocean up the St. Lawrence and by Lake down the same river simultaneously, coal from West Virginia via Lake Erie ports to Buffalo, and byproduct coke from Boston to Newark, N. J., are freaks of distribution made possible by changes in previous differentials arising from high rail freights and the low mine prices on non-union coal.

Competition in 1921 threatened to upset all traditions of the trade. Hardly a consuming center but saw strange coals last year. The energy of distributors was boundless, for the spur of necessity drove them to extreme ends in the effort to market their product. In the first eight months of the coal year—that is, from April to November inclusive—the percentage of waterborne coal into New England rose to 53 per cent, exceeded in the past six years only by the record of 59 per cent in 1916-1917. It is probable that by the end of the year the old ratio of 60 per cent water and 40 per cent rail coal will be reached. The total receipts of soft coal in New England for 1921 will be the lowest in the last six years. Shipments of bituminous coal to the Northwest via the Great Lakes in 1921 were approximately as great as in either 1919 or in 1920. The total movement of bituminous coal to tidewater fell off approximately one-third in 1921 from 1920.

The high level of freight rates had the effect on distribution of encouraging short-haul and discouraging long-haul movements. When a community, as in part of Illinois, could obtain local coals on short hauls, these coals, though often inferior, were used in preference to better coals from more distant mines normally used.



RELATIVE SPOT PRICES OF BITUMINOUS COAL AT THE MINES, 1913-1921

This diagram shows the relative prices, not the actual prices, shown in succeeding diagrams in this issue of COAL AGE for particular coals. Prices for fourteen coals, representative of nearly 90 per cent of the total output of the United States, were weighted in accordance, first, with respect to the proportions of each of slack, prepared and run-of-mine normally shipped and, second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the Report on *Prices of Coal and Coke*, 1913-1918, published by the Geological Survey and the War Industries Board. The result is a series of index numbers.

This curve therefore truly reflects the movement of the spot price of bituminous coal for the past nine years. In that period there were two price peaks—October, 1916, to July, 1917, and June-November, 1920. There also were two periods during which the spot price of coal was regulated by the federal government, August, 1917, to January, 1919, and November, 1919, to April, 1920. The restraint imposed on the market by this regulation is clearly illustrated in this diagram as on those of the several coals elsewhere in this issue.

The characteristic feature of spot prices in 1921 was the steady downward trend, in part attributable to the lack of demand but largely to the persistent influence of lower quotations in non-union coals.

PITTSBURGH COAL CO. DOCK NO. 7, DULUTH-SUPERIOR HARBOR

Lake Market Kept Flooded with Coal Throughout Season When Demand Elsewhere Was Poor

Producing Fields, Especially Non-Unions, Send Heavy Volume — Total Traffic of 23,171,449 Tons Beats 1919 by 421,057 Tons and Falls Only 504,311 Short of 1920—Stocks Piled High Now

BY WILLIAM A. WHITE

COAL played its part sturdily and well in the 1921 industrial drama of the Great Lakes. Whatever may be said concerning the performance of other elements vital to business during the hectic year just relegated to history, none can justly revile this basic fuel. It flowed easily and in tremendous volume from Erie to the Head-of-the Lakes. Bottoms were always ready to hasten it along and there was no car shortage to choke either its heavy stream from the mines or its delivery inland from any upper dock. Contracts were filled exactly on schedule and spot buyers never found a bare market. Had the heavy body of industry which clusters about the Lakes shaken off its paralysis, fuel would have injected into it every ounce of vigor to be expected from that source. Coal was ready. It simply was denied its opportunity.

In spite of its discouragements, however, the 1921 volume of bituminous coal traffic which pulsed through the Lakes—23,171,449 tons—exceeded that of 1919 by 421,057 tons and failed to rise above the 1920 mark by only 504,311 tons. Light coal consumption by Lake vessels was directly responsible for that failure. Cargo coal totaled 22,412,380 tons. Thus 4,025 tons more coal was borne into the Lake region for home and industrial consumption than the region took in 1920. But this narrow lead over 1920 was engulfed in a slump in consumption by Lake vessels from 1,258,783 tons in 1920 to 759,069 tons last year. It is obvious that Lake shipping was in the dumps.

The total number of ships passing through the American and Canadian canals at "The Soo" between lower and upper Lake ports was only 9,653. The year before it was 13,193. This decrease is 27 per cent on total shipping, but coal shipments through the two canals increased substantially over 1920 —soft coal by 3 per cent and hard by 10 per cent. Coal had no hampering effect on business for Lake vessels; neither did lumber, flour, wheat and other grains. It was copper, iron ore and pig and manufactured iron that slumped—60 per cent in the case of iron ore, 49 for iron products and 39 for copper.

Long before the Lake season opened the hard-put producing areas within reach of Lake ports—and some that normally faced other directions for their outlets—began eyeing the Lakes hopefully. Markets elsewhere were down.

The season opened with a rush. Producers thought this business would "take up the slack" in the coal market. Shipments boomed throughout May and June, operators using the Lake outlet to the limit of the Lake Erie port facilities. Dumpings exceeded those of the corresponding periods of 1919 and the absorption of so much production temporarily bolstered declining coal prices for the country as a whole. Upper docks were soon glutted, however, and the "buyers' strike" kept shipments to the interior at such a low level that cargoes were unloaded with increasing difficulty in the months of navigable weather.

The end of the British coal strike in July snatched European business back to the eastern side of the Atlantic. About all the coal raised within the next few months would have flowed Lakeward had there been the least excuse for tilting the economic base in that direction.

Non-union coals such as those in Kentucky that are served by the Louisville & Nashville R.R. began unloading in March on the docks at Toledo. This non-union tonnage in the Lake market became overwhelming. The previous year not a ton of Kentucky coal from the L. & N. territory had reached Toledo until May and only 18,000 tons in that month. But in May of 1921 the total was 178,757 tons and in June 389,850 tons. This flow in somewhat lighter proportions continued right up to the end of the season. By Nov. 1 the volume had reached 1,511,875 tons, or 1,039,400 tons above the mark set Nov. 1, 1920, and nearly three times the 1919 figure. Other fields shipped to Lower Lake ports wherever wages, DESTINATION OF CARGO COAL DUMPED AT LAKE ERIE PORTS DURING THE SEASON OF 1921, COMPARED WITH 1919 and 1920†

	1919		1920		1921	
	Net tons	Per cent	Net tons	Per cent	Net tons	Per cent
American						
Lake Superior ports	9,426,000	43.4	9,330,000	41.6	9,908,000	44.2
Sault Ste. Marie and river points	350,000	1.6	563,000	2.5	356,000	1.5
Lake Huron-Georgian Bay ports	303,000	1.4	213,000	0.9	232,000	1.0
Lake Michigan ports	6,680,000	30.7	5,460,000	24.4	6,173,000	27.6
Port Huron and Detroit River	348,000	1.6	846,000	3.8	739,000	3.3
Lake Erie ports	73,000	0.4	65,000	0.3	244,000	1.1
Total American	17,180,000	79.1	16,477,000	73.5	17,632,000	78.7
Canadian						
Lake Superior ports	1,581,000	7.3	1,965,000	8.8	2,006,000	8.9
Sault Ste. Marie and river points	811,000	3.7	1,092,000	4.9	752,000	3.4
Lake Huron-Georgian Bay ports	740,000	3.4	1,006,000	4.5	766,000	3.4
Port Huron and Detroit River	364,000	1.7	443,000	2.0	398,000	1.8
Lake Erie ports	49,000	0.2	10,000	.....	91,000	0.4
Lake Ontario and St. Lawrence River	988,000	4.6	1,415,000	6.3	767,000	3.4
Total Canadian	4,533,000	20.9	5,931,000	26.5	4,780,000	21.3
Grand Total	21,713,000	100.0	22,403,000	100.0	22,412,000	100.0

†Compiled by Ore & Coal Exchange.

RECEIPTS OF COAL AT DULUTH-SUPERIOR HARBOR DURING THE SEASON OF 1921

	Hard	Soft	Total
September	207,901	647,095	845,996
October	257,240	808,260	1,065,500
November	141,496	325,457	466,953
December	31,306	25,666	56,972
Total season, 1921	1,844,642	8,320,207	10,164,849
Total season, 1920	1,637,447	7,393,219	9,030,696
Total season, 1919	1,795,257	7,079,840	8,875,097
Total season, 1918	1,669,473	9,721,440	11,390,913

freight rates and other competitive conditions permitted. As in other markets the non-unionized districts, with their lower costs, took the cream of the business offered.

Dumpings over Lake Erie docks paralleled those of 1920 closely during the first several months of navigation. At the end of October the total for 1921 was 20,870,869 tons, which exceeded 1920 at that date by nearly 800,000 tons and 1919 by 110,000 tons. But by that time the 1921 market was saturated, dock stocks presumably were large enough for safety even in case of a miners' strike in the coming spring, and dock storage was full with practically no outlet. Even a break in prices at the last minute failed to liven up the market—though a few iron mines began to buy—and vessel movement of coal fell away. So toward the close of the season the 1921 total traffic dropped behind that of 1920.

SEASONS OF 1921 AND 1919 SIMILAR

The season of 1921 resembled that of 1919 in many respects but in none more than in the destination of coal shipped up the Lakes. The tonnages and the relative proportions moving to American and Canadian ports are almost exactly the same. American ports took approximately 79 per cent and Canadian 21 per cent. Perhaps the most significant shift in distribution between 1921 and 1919 was an increase of 500,000 tons in the amount taken at American docks on Lake Superior—an increase counterbalanced by a decrease from 1919 in the total taken by Lake Michigan cities. An accompanying table illustrates the upper Lake increase.

While Lake Michigan in 1921 received 3.1 per cent less coal than in 1919, still its ports took 3.2 per cent more than in 1920. The total is 6,173,000 net tons, or 27.6 per cent of all the coal dumped over Lake Erie docks. Lake Superior American ports took 9,908,000 tons, which is 44.2 per cent of the total Lake movement.

MILWAUKEE RECEIPTS EXCEED 1920

Milwaukee receipts by vessel were representative of Lake Michigan port activities for that city, printed on another page of this issue, show that the port took 149,642 tons more hard coal than in 1920 and 198,095 tons soft coal. Receipts there were heavy through the whole Lake season but marketing was difficult because of soft weather and the general depression of business. The end of the Lake season found Milwaukee yards and docks full of coal. Dock men hadn't sold as much as they had hoped.

The dock carry-over at the beginning of the 1921 season was well in excess of the 1920 figure at the Head-of-the-Lakes. Hard-coal tonnage was just under 100,000 and there were approximately 1,000,000 tons of soft coal on hand from the 1920 season. Owing to the poor movement off the docks it was impossible to receive as much tonnage as was thought advisable. The same factors which reduced consumption elsewhere, however, rendered the season's receipts entirely adequate for all demands made upon dock men. Inland movement totaled 7,883 cars in May (10,401 cars in May, 1920), 9,557 cars in June and 13,448 during July (15,052 in July, 1920). While the movement increased throughout the year, the aggregate amount shipped was far less than normal and permitted but little turnover of dock supplies.

At the present rate of movement to the interior there will be a considerable tonnage of coal left on the docks on April 1, 1922, the disposition of which may prove profitable. A protracted miners' strike at that time would clear this surplus tonnage, but a short one which would reduce production costs thereafter, would mean further slashes in prices to move this coal, which would be in a perilous situation because of the cheaper replacements by Lake and the sharper all-rail competition.

LAKE ANTHRACITE MOVEMENT HEAVY

Anthracite movement up the Lakes was heavy, being 3,814,487 tons, as compared with 3,584,286 tons in 1920 and 4,156,218 in 1919. The light movement toward the end of the season, the advance over 1920 being reduced from 600,000 tons to 230,000, was caused by congestion at the upper docks. The bulk of the vessel shipments went forward in July, the volume dwindling steadily from that month.

The season officially closed Dec. 1, when insurance rates on cargoes doubled. Open weather permitted total dumpings of 69,557 tons after that, however. The last cargo of the season reaching the Head-of-the-Lakes was unloaded at Duluth-Superior harbor Dec. 8, completing a season total of 10,164,849 tons for that port. When the last vessel was light, the Lakes ended a season whose volume approached within half a million tons of 1920 and fell about 6,000,000 tons short of that "bumper" of all years, 1918. The season closed with many winter cargoes alongside docks. Thus the 1921 Lake coal trade, harassed though it was by industrial stagnation, goes down as the third largest in history.

Bituminous Coal Loaded Into Vessels at Lake Ports as Dumped by Docks, Seasons 1921, 1920 and 1919

Ports	Railroads	1921			1920			1919		
		Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo	Hocking Valley	4,426,687	116,157	4,542,884	3,930,269	93,095	4,023,364	4,276,148	119,024	4,395,172
	Toledo & Ohio Central	1,106,251	32,319	1,138,570	1,729,894	65,695	1,795,589	1,159,908	33,925	1,193,833
	Baltimore & Ohio	2,561,015	78,085	2,639,100	1,619,875	44,804	1,664,679	2,293,513	53,888	2,347,401
Sandusky	Pennsylvania	1,853,148	52,138	1,905,286	1,604,305	26,542	1,630,847	1,407,263	34,765	1,442,020
Huron	Wheeling & Lake Erie	1,577,500	45,468	1,622,968	1,864,527	93,919	1,958,446	1,437,640	50,876	1,488,516
Lorain	Baltimore & Ohio	2,546,216	103,113	2,649,329	3,276,539	211,643	3,488,182	2,720,541	150,909	2,871,450
Cleveland	Pennsylvania	2,062,722	91,910	2,154,632	1,221,955	180,335	1,402,290	2,234,951	249,693	2,484,644
	Erie	359,981	12,782	372,763	437,653	19,234	456,887	305,977	9,904	315,881
Fairport	Baltimore & Ohio	....	....	....	....	....	....	16,692	12,954	29,646
Ashtabula	New York Central	1,125,792	62,214	1,188,006	1,641,732	274,396	1,916,128	1,657,048	149,965	1,817,013
	Pennsylvania	2,300,210	78,097	2,378,307	1,942,021	101,706	2,043,727	1,955,796	100,982	2,056,778
Conneaut	Bessemer & Lake Erie	1,474,202	20,603	1,494,805	2,405,884	41,076	2,446,960	1,372,321	10,398	1,382,719
Erie	Pennsylvania—West	770,091	27,030	797,121	284,860	27,850	312,710	702,242	43,322	745,564
	Pennsylvania—East	248,565	39,153	287,718	448,841	78,488	527,329	163,301	16,446	179,747
Totals		22,412,380	759,069	23,171,449	22,408,355	1,258,783	23,667,138	21,713,341	1,037,051	22,750,392

* Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, Manager.

Who Consumes All This American Coal?

Geological Survey Charts Show 93.9 Per Cent Stays At Home—Seven-Tenths of This Is Subject to Every Business Fluctuation—1921 Consumption Drops 24 Per Cent, Indicating Worst Year in History

By F. G. Tryon and W. F. McKenney*

PROPHECY always has its pitfalls, and about nothing have more false prophecies been made than about bituminous coal. What observer a year ago foresaw the full depth of the depression which 1921 was to reveal? Many attempting to forecast requirements at that time looked upon the depression as temporary and predicted an early revival of business, the first signs of which were expected not later than the beginning of the coal year. In retrospect how blind we seem, not to have been able to visualize the canyon-like depth of the valley of tribulation that lay before us!

And yet the coal trade cannot escape the necessity of forecasting demand as best it can. The absorbing question which all who buy and sell must try to answer is "What will be the requirements for domestic consumption and export in 1922?"

Forecast Needs from the Past

The best way to forecast requirements is to study the past. It is a subject in which hindsight is as necessary as foresight, and where progress depends on the accumulation of accurate records of how coal is burned from season to season and year to year. This article attempts to summarize the available facts as to consumption in 1921, particularly the rate of consumption at the close of the year, for that rate also is to control the demand in the opening days of 1922. For the sake of brevity only bituminous coal will be discussed.

In a year when industry is going at full speed it now requires about 550,000,000 tons to care for our domestic users of bituminous and to meet present demands for exports. How this total is divided among the principal items of the country's budget is shown in the table below, illustrated graphically in Diagram I:

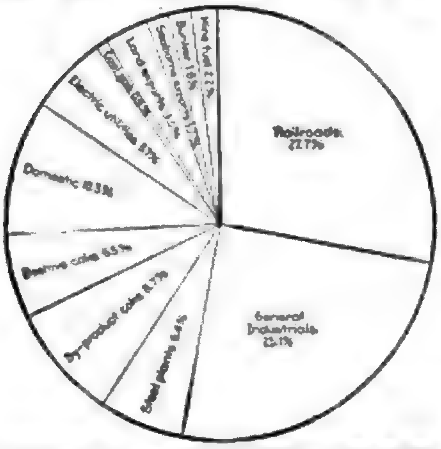


DIAGRAM I.—CONSUMPTION OF SOFT COAL BY USES

The diagram shows the principal items in a year of active business. The figures are for 1917, adapted, however, to allow for an increase in sea-borne exports and a shift from beehive to byproduct coke.

The first thing to note is that the market for American coal is overwhelmingly a domestic market, and that conditions abroad can have only a subsidiary influence upon the demand for our coal. The land exports (3 per cent of the total), the seaborne exports (1.7 per cent), and bunker coal for ships in foreign trade (1.4 per cent) represent the coal that leaves the country. In the aggregate this amounts to but 6.1 per cent of the total demand. Indeed the largest element in our foreign trade—the exports to Canada—parallels closely the domestic demand, since business conditions in the two countries are similar.

Out of the 93.9 per cent of the production which is consumed at home and therefore subject to the cycles of boom and depression in the United States itself, fully seven-tenths goes to three major classes of consumers, the railroads, the general industries and the steel industry with its satellites, beehive and byproduct coke.

Roads Best Bituminous Customers

The railroads are still the largest customers served by the bituminous producer, absorbing 27 to 28 per cent of his total product with surprising regularity. Next to the railroads comes the group of industrials other than steel and byproduct plants, which includes the 340-odd manufacturing industries and the forest and mineral industries, excepting only coal mining. This group of general industrials normally absorbs a fourth of the total output—in 1917, 25.1 per cent.

What is not so generally realized is that including coal that is used as such, and the coal equivalent of the coke which finds its way into blast furnaces, the steel industry uses almost as much coal as all other manufacturing enterprises combined. Its total annual requirements, when business is active, approximate 100,000,000 tons.

Now the demands of these three principal customers of the soft-coal producer all contract sharply at times of depression. In other words, 71 per cent of the soft-coal demand is an elastic, unstable demand, varying markedly with the business cycle. Small wonder, then that coal is quick to feel any change in the general tone of business, for there can be no slackening of activity in any line of industry that is not reflected in the demand for coal. A fifth of the demand is concentrated in the steel industry alone, which of all major activities is most affected by industrial depression.

Turning now to the stabler items, domestic cooking and heating, and gas and electric utilities, we find they take barely a fifth of the normal output, a share so small that their balance-wheel influence is not sufficient to steady the demand for soft coal from one year to the next.

There is no question but that the business depression is the cause—practically the only cause—of the 150,000,000-ton decrease in output which marked 1921. The total production was 73 per cent of that in 1920; the total exports, 60 per cent of 1920; the total domestic consumption, 76 per cent of 1920. We now know that there was no significant change in the quantity in

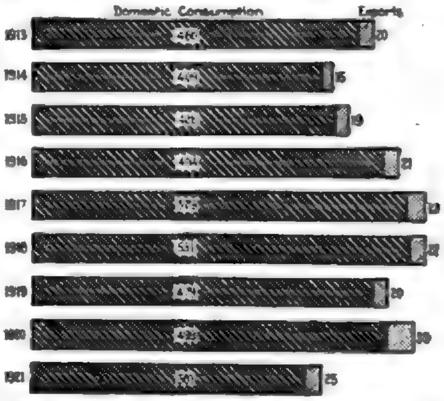


DIAGRAM II.—DOMESTIC CONSUMPTION AND EXPORTS OF BITUMINOUS COAL FOR 9 YEARS

Figures represent million net tons. Domestic consumption allows for movement of coal in and out of storage during the years for which storage records are available.

SOFT COAL CONSUMED IN UNITED STATES AND EXPORTED IN A YEAR OF ACTIVE BUSINESS (a)

	Net tons	Per cent
Railroads	153,700,000	27.7
Industrials, other than steel and coke	139,100,000	25.1
Steel plants	35,500,000	6.4
Coke:		
Beehive	36,000,000	6.5
By-product	47,740,000	8.7
Public Utilities:		
Electric	31,700,000	5.7
Coal gas (b)	4,960,000	0.9
Domestic consumers	57,100,000	10.3
Coal mine fuel	12,100,000	2.2
Exports:		
Canada and Mexico	16,500,000	3.0
Seaborne	9,500,000	1.7
Bunkers:		
Foreign trade	6,700,000	1.2
Coastwise and Lake trade	3,600,000	0.6
Total	554,200,000	100.0

(a) The figures are for the year 1917, except that the exports are the preliminary figures for 1921, and that the proportions between beehive and byproduct coke are those which obtained in 1920.

(b) Excludes coal consumed in byproduct coke ovens supplying gas for city use, which is included under byproduct coke.

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*Coal and Coke Section, U. S. Geological Survey. Published by permission of the Director of the Survey.

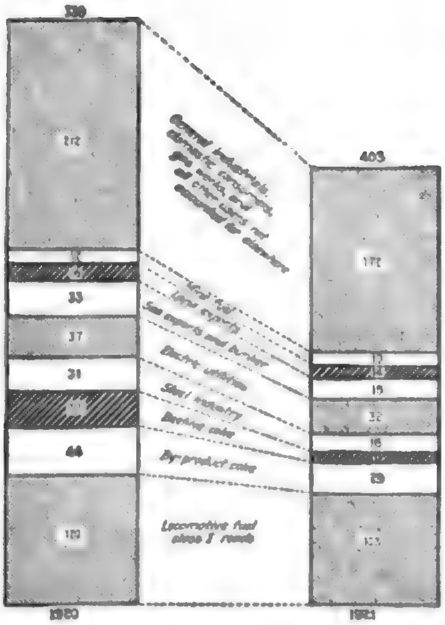

DIAGRAM III.—HOW BITUMINOUS CONSUMPTION IN 1921 COMPARED WITH 1920

The total domestic consumption and exports in 1921 were about 403,000,000 net tons, or 135,000,000 less than in 1920. In what departments of the trade this 25 per cent shrinkage occurred is suggested by the diagram. The figures represent million net tons. They are necessarily approximate, as the available information is still incomplete.

storage from the beginning to the end of the year. In fact, counting the coal on the Upper Lake docks, it is probable that the above-ground reserves on Jan. 1, 1922, were slightly larger than on the corresponding day a year ago. The significant fact to remember is that domestic consumption in 1921 fell off 24 per cent.

Other Industries Hard Hit

It has been remarked that the bituminous industry was lucky to get off with a decrease of only 24 per cent when other industries showed a more precipitate drop. But the fact is that a decrease in coal *consumption* of 24 per cent is unprecedented in the United States. For example, after the disastrous panic of 1873 it dropped but 11.6 per cent. After 1893 it fell off still less, while in 1907 it slumped 15.8 per cent. In the dull year of 1914 it was less than in the active year of 1913 by only 11.6 per cent. In 1919 (speaking always of consumption, not production, it was but 9.8 per cent behind 1918. A drop of 24 per cent therefore means that so far as measured by the demand for coal, the business depression of 1921 is the most serious on record.*

How the total domestic consumption and the total exports have varied from year to year is pictured in the second of the diagrams. It will be noted that while exports showed a sharp decrease with respect to 1920, this was more because 1920 was abnormally high than because 1921 was abnormally low. In fact, our exports last year exceeded the pre-war level.

Wherein lay this great shrinkage in demand? As near as it can be determined it is shown in the proportions indicated in Diagram III. The most spectacular drop was in the quantity used for beehive coke, which fell off 73 per cent. This extraordinary slump was in part accounted for by the transfer of business from beehive to byproduct ovens, whose consumption fell off 34 per cent. The cut in total coal used for coke manufacture approximated 51 per cent.

Foreign Business Drops Off

Offshore exports and foreign bunker fell to little more than half the 1920 rate. From the production of ingot steel it is estimated that the consumption of the steel industry likewise was only about half that in 1920. Locomotive fuel consumption dropped at least 17,000,000 tons, and the general industrial consumption perhaps 39,000,000 tons, or 30 per cent. Even the electric utilities, steadiest of all the consumers of coal, seemed to have taken 13 per cent less in 1921 than in 1920, a decrease in part attributable to the substitution of fuel oil for coal.

The big tonnage cut came, as was to have been expected, in the items of steel, general industries and railroad fuel. Striking as was the drop in seaborne exports, it accounted for but 11,000,000 out of the total decrease of 135,000,000 tons.

Plotting the scattered information at hand concerning the current rate of consumption, Diagram IV is obtained. The diagram shows clearly that the year closed without any recovery sufficient to bring the amount of coal burned weekly up to the rate prevailing on New Year's Day, 1921. The consumption for locomotive fuel showed a marked recovery in October, the latest date for which figures have been received, but this recovery was due more to the coincidence of the crop-moving season and a sudden increase of business in anticipation of a possible railroad strike than to a permanent recovery in the volume of traffic.

Steel and Coke Move Upward

The curves of steel and of coke have definitely started upward from the low point touched in July. Advance information on the production of coke in December, received since the diagram was sent to the engraver, indicates a further slight increase. The most that can be expected, however, will not raise the output of coke for that month above 55 per cent of the 1920 average. In other words, the coke industry entered 1922 consuming coal at a monthly rate 3,000,000 tons below the 1920 standard.

What has happened to the current rate of consumption at industrial establishments no one knows, but the Geological Survey has received no information to indicate a recovery greater than might be expected with the approach of colder weather.

This year opened with the total weekly consumption and net exports at not much over 8,000,000 tons a week. A normal year at this season would show probably not less than 11,500,000 tons a week.

Since the prospects of the coal producer for 1922 are so interwoven with the general trend of business, it is time to consult the professional economist to

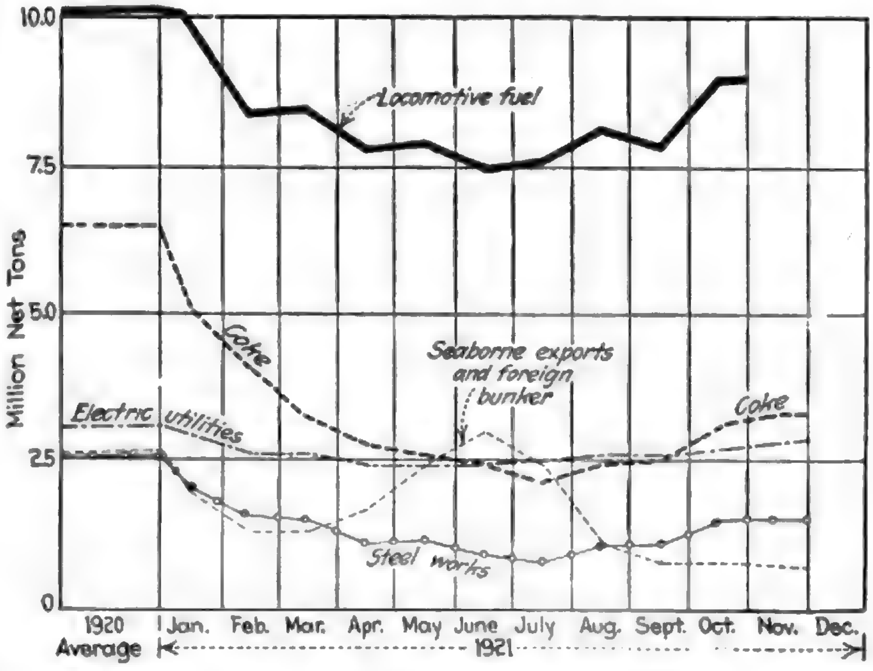

DIAGRAM IV.—THE TREND OF COAL CONSUMPTION

We now know from month to month the quantity of coal consumed by certain of the largest users. This diagram shows the amount used by the locomotives on Class I roads, by coke ovens (beehive as well as byproduct), by electric utilities and by steel works (estimated from ingot production). Note the rise in offshore exports and foreign bunker during the months of May and June, when the British miners' strike was on. For comparison, the monthly average in 1920 is shown.

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*The compete record of the years since 1860 in which production of soft coal has shown a decrease is as follows:

Pair of years	Per cent decrease	Pair of years	Per cent decrease
1868–9	2.4	1907–8	15.8
1873–4	11.6	1910–11	2.7
1884–5	12.3	1913–14	11.6
1888–9	6.2	1918–19	9.8a
1893–4	7.5	1920–21	23.7a
1903–4	1.4		

(a) Allows for changes in stocks

see what light he can throw upon the chances of a business revival. Those learned societies, the American Statistical Association and the American Economic Association, meeting in Pittsburgh during the holidays, devoted much thought to the business cycle, discussing its causes, its effects, and possible remedies. The discussion revealed a wholesome respect for the intricacy of the problem, and a minute and painstaking analysis of the course of the present depression up to the end of 1921. While the speakers refrained from prophecy, there was some approach to agreement in the opinions expressed in the cloak rooms and over the luncheon table. The collective mind of the economists of the country looks for no boom, no prompt return to normal activity. Recognizing that the low point of the present cycle probably has been reached, these disinterested observers see a tedious convalescence.

Tidewater Tonnage Gains Over 1919 and War Years

Dumpings, 37,000,000 Tons, Are 30 Per Cent Under Peak Year 1920—British Strike Makes June a Record Breaker But Exports for Year Slump from 22,000,000 to 9,600,000 Tons—Coastwise Freight Rates Drop

By J. S. Burrows*

THE bituminous tidewater business of 1921 is not seen in its proper perspective if compared, in the customary manner, with the preceding year. In fact, owing to a complete reversal of conditions at the beginning of 1921, the year is as unique in its way as was the preceding twelvemonth. If the statistics for the two years tell any story, it is simply that "what goes up must come down."

On the whole, however, the volume of tonnage dumped—approximately 37,000,000 net tons—is not so bad, in the light of our pre-war experience. On the other hand the pessimists may take comfort from the fact that this 37,000,000 tons represents a falling off of about 30 per cent from the peak set last year. However, when the complete figures for the five separate north Atlantic ports are examined, it will be found that, going back to 1919 and the war years, there has been a gain in tonnage, except, perhaps at New York.

The glare and glitter of 1920 as a background blinds one to the progress that has been made throughout the past year, towards a normal, healthy position in the industry. As the tidewater market was, rightfully or wrongfully, blamed for the "jamboree" of 1920 it would be well to examine this background for a moment.

In 1920 there was the unprecedented dumping at tidewater of 53,000,000 net tons. As a result of a world shortage of fuel there was a greatly expanded export trade of 22,000,000 net tons.

A shortage of coal was the cry in New England and along the Atlantic coast, as well as inland. Nearly all steamships bunkered for the round trip or for greater steaming distances. There was a tremendous demand everywhere. Prices were unstable and rose rapidly. "Big production," "big prices," "big profits" was the "big" program of the industry. In short, it was a sellers' market, and a runaway market at that.

But! There was the operator whose oft-expressed ambition in life was "to get a cent a pound for *my* coal." There were the newly and quickly formed export firms composed of the dollar a ton men who carried contracts for "millions of tons" around in their pockets. There were broken contracts and litigation, unheeded complaints about coal, mounting costs of operation, and a lot of other things. And at the end of this hectic year there was the income tax.

These are all worth thinking about in considering 1921. Were they constructive factors or destructive?

Along in the early autumn of 1920 the Eastern Gold Coast, as seen from afar in the Appalachians, began to lose some of its glitter. The ports began to fill up with coal. Prices began to shade off, soften and finally tumble. It was known as 1921 opened that the turn had come.

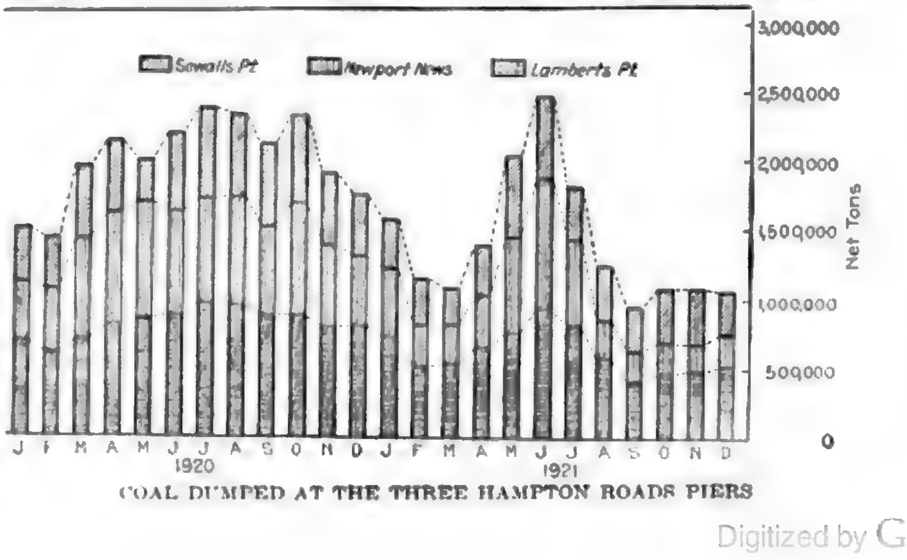
The extent of the decline in prices throughout 1921 is well represented by the curves of spot prices of Pocahontas (p. 131), W. Va. high-volatile (p. 143), Pool 9 Pennsylvania coal (p. 117), and others in this issue of COAL AGE. Pocahontas is taken as the standard for Hampton Roads, while Pool 9 is representative of the better grades of coal at the Northern ports.

As will be seen from the diagrams representing the monthly distribution of coal from each port, as well as the corresponding tables, the decline in shipments which had already set in during the fall of 1920 continued with slight fluctuations until April, 1921. In April there was some improvement, the total dumpings reaching 3,000,000 tons. In May the total monthly dumping had increased to 3,800,000 tons and it began to look like another 1920 at tidewater in so far as tonnage was concerned. This increase was coincident with the cessation of work by the British coal miners.

The prolonged British strike and the

COAL DUMPED AT HAMPTON ROADS, BY MONTHS AND PIERS, 1921.
(In Gross Tons)

Months	Lamberts Pt.	Newport News	Sewalls Point	Total
January	654,383	440,157	330,069	1,424,609
February	475,099	260,297	291,517	1,026,913
March	486,172	250,952	225,790	962,914
April	585,991	343,935	323,490	1,253,416
May	680,226	631,737	518,662	1,830,625
June	844,139	833,480	533,206	2,210,825
July	731,708	561,682	334,828	1,628,218
August	534,487	222,964	357,938	1,115,389
September	372,901	195,271	286,826	854,998
October	420,852	208,199	351,230	980,281
November	444,946	160,940	366,715	972,601
December	469,169	207,642	278,280	955,091
Total	6,700,073	4,317,256	4,198,551	15,215,880



COAL DUMPED AT THE THREE HAMPTON ROADS PIERS resulting scarcity of coal abroad made June a record breaker in tidewater annals. A total of about 4,500,000 tons was dumped. The largest tonnage in the history of Hampton Roads was loaded in June owing to the Chesapeake & Ohio Ry. dumping the largest tonnage in its history while Lamberts Point and Sewalls Point each contributed large tonnages to the total. The Newport News pools were well stocked with high-volatile steam and gas coals and a brisk demand from abroad developed for prompt shipment of these grades. Baltimore and Philadelphia doubled their exports during this record month.

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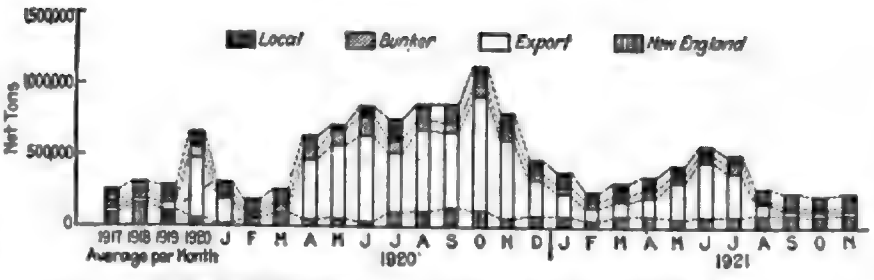
*Of Castner, Curran & Bullitt, Inc., New York City.

The "carrying of coals to Newcastle" ran well into July, which showed a total dumping of 3,600,000 tons, the decrease being in exports. An interesting point about this phase of the year's business was the comparatively small effect that this sudden demand had upon prices which continued to decline.

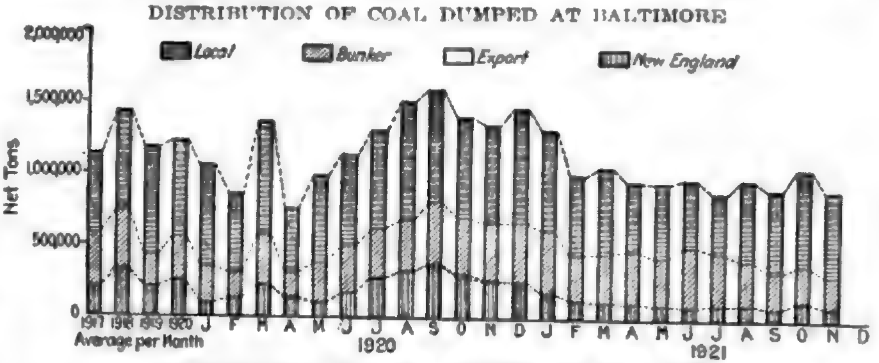
In August the total tonnage dumped at all ports slumped back near the 3,000,000 ton mark established during the early months of the year with a dumping of 2,500,000 tons in September, 2,800,000 in October, and again 2,500,000 tons in November, which set the pace for the close of the year.

Of the total tonnage dumped during the year at all North Atlantic ports—approximately 37,000,000 tons—the largest amount, or about 10,500,000 tons, was delivered to local harbor points and inside the Capes mostly at New York. About 9,000,000 tons were shipped to New England as compared with nearly 10,500,000 tons in the previous year and 8,500,000 in 1919. Total bunker requirements were approximately 8,000,000 net tons as compared with 9,000,000 in 1919. The great loss was, of course, in exports, which dropped from 22,000,000 tons in 1920 to about 9,600,000 tons in 1921. Of this, 3,000,000 tons, taken mostly from Hampton Roads, may be attributed directly to the British strike.

Coincident with the increase in export dumping during the strike period, there was quite a sharp increase, lasting from May until August, in the amount of bunker coal taken. In addition to the extra shipping employed in transporting the export coal, other steamers were taking extra bunker supplies mostly for the round trip. The tables accompanying this article will disclose in detail how each of the ports fared during the year.



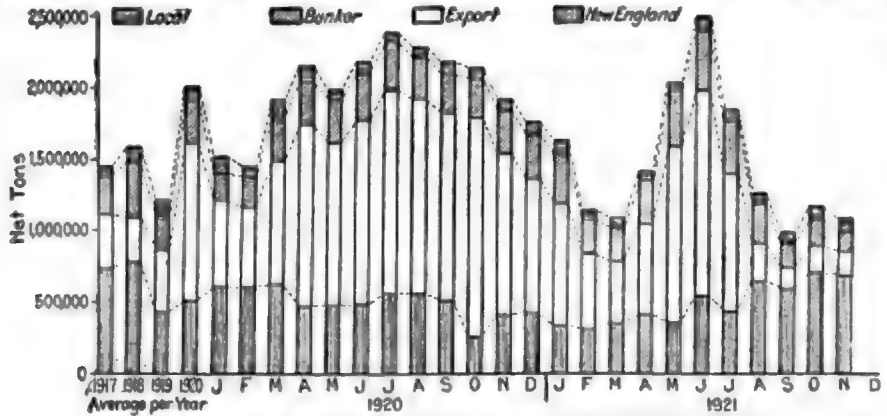
DISTRIBUTION OF COAL DUMPED AT BALTIMORE



DISTRIBUTION OF COAL DUMPED AT NEW YORK

Summary of Tidewater Bituminous Coal Business for Four Years, in Net Tons

By Ports:	1918	1919	1920	1921
New York	17,091,000	14,234,000	14,825,000	11,912,000
Philadelphia	3,121,000	4,411,000	6,191,000	3,641,000
Baltimore	3,641,000	3,467,000	7,831,000	4,136,000
Hampton Roads	18,977,000	14,630,000	24,026,000	17,242,000
Charleston	79,000	320,000	911,000	392,000
All ports	42,909,000	37,062,000	53,784,000	37,323,000
By Destinations:				
Coastwise to New England	15,248,000	8,386,000	10,457,000	8,859,000
Exports	3,741,000	8,292,000	21,778,000	9,633,000
Bunker	6,063,000	6,874,000	9,171,000	8,135,000
Inside capes	4,476,000	3,438,000	3,410,000	3,251,000
Other tonnage	13,381,000	10,072,000	8,968,000	7,445,000
All destinations	42,909,000	37,062,000	53,784,000	37,323,000



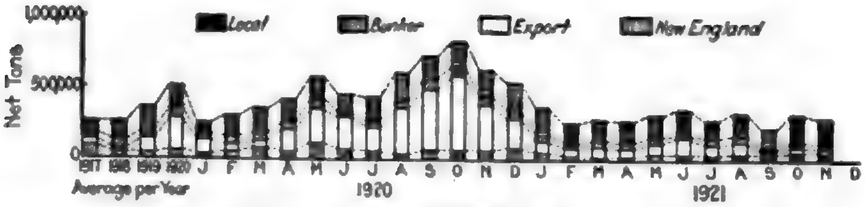
DISTRIBUTION OF COAL DUMPED AT HAMPTON ROADS

The pooling arrangements at the north Atlantic ports which were adopted during the war and continued over 1920 went through many changes during the year. The Tidewater Exchange which operated at New York, Philadelphia and Baltimore was dissolved after several attempts at reorganization. Heavy demurrage, due to the lack of business, and many withdrawals from its membership early in the year pointed out the uselessness of its continuation.

At Hampton Roads the three separate exchanges, for the three terminals, which were organized in the spring of 1920 continued to the close of 1921, but lost membership toward the latter part of the year to an extent that now makes their continuation problematical.

In January, 1921, the Sewalls Point Coal Exchange, which, in co-operation with the U. S. Bureau of Mines, had been making a thorough investigation of the coals shipped through it, adopted chemical standards, putting these new standards into effect with new rules and classifications shortly thereafter. Later in the year this exchange completed its elaborate mechanical sampling plant for obtaining adequate samples of coal from cars shipped to its pools. The sampling plant has been in operation throughout the year and the quality of shipments to the Sewalls Point pools controlled in accordance with the results found by the Bureau of Mines.

During the year the demand for quality in coal has reasserted itself strongly, with the result that mines producing the poorer grades of coal have had to close down. In the main the tonnage dumped at tidewater has been shipped from the highest-grade mines. At Hampton Roads, for instance, the last half of the year witnessed a business almost entirely in Pool 1 coal, there being little or no demand for the other grades of low-volatile coal. The same may be said of the business done in the high-volatile coals at tidewater—only the better grades found any demand.



DISTRIBUTION OF COAL DUMPED AT PHILADELPHIA

As the price declined during the year, the question of mine operating costs became of paramount importance and much tonnage was shut off from tidewater through inability to meet competition.

The combination of lower costs and better quality resulted in some unusual destinations for Southern coal. Hampton Roads smokeless coal was shipped to New York as well as up the Delaware to Philadelphia against the long-established freight differentials in favor of Pennsylvania coal. A byproduct plant in New Jersey is running on a gas coal from the South that is best known in such cities as Atlanta and Charleston, S. C. As one coal man commented, "You have to do something that has not been done before."

In foreign markets the competition of British coal, notwithstanding the British strike and higher costs, was too keen for America. Since the resumption of mining the price of British coal at loading ports has steadily declined and apparently regardless of cost British exporters are determined to hold their old markets and gain new ones.

British coal is being laid down on the Pacific Coast via the Canal at a dollar less than American coal from the Eastern seaboard and cargoes have been reported for sale on our own North Atlantic coast. Great Britain's low ocean freights explain her advantageous position at the present time, in many cases coal going out as ballast.

American coastwise freights, which were high at the beginning of 1921—around $2.50 to $2.75 from Hampton Roads to Boston, for instance—reached pre-war levels of 90c. to $1 during the late months. The situation of American bottoms in overseas trade is too well known to warrant discussion here.

It is generally believed that in order to put American coal in favorable competition with British coal abroad the rate to tidewater on export coal should be reduced $1 per ton, but the railroads have declined to do this.

As in all other business in this country during 1921, the tidewater branch of the coal trade has been adjusting itself to a new and more stable basis. Throughout the year constructive forces were relentlessly at work which, in the long run, will make for the good of the industry. Competition is again putting a premium on efficiency in mining and selling and is eliminating the economically unfit.

We have still some distance to go, particularly in the matter of mining costs and transportation charges, but at the end of the year the tidewater coal trade found itself a long way over the road to that much discussed destination—Normalcy.

Destination of Bituminous Coal Shipped to Tidewater In 1921, by Months, in Net Tons

HAMPTON ROADS

	New England	Export	Bunkers	Inside Capes	Other Tonnages	Total
January	332,000	867,000	305,000	31,000	90,000	1,625,000
February	310,000	527,000	234,000	31,000	44,000	1,146,000
March	364,000	421,000	228,000	27,000	59,000	1,099,000
April	408,000	640,000	319,000	17,000	27,000	1,411,000
May	360,000	1,217,000	408,000	21,000	25,000	2,031,000
June	505,000	1,480,000	406,000	27,000	77,000	2,495,000
July	445,000	954,000	368,000	28,000	48,000	1,843,000
August	650,000	252,000	280,000	21,000	58,000	1,261,000
September	590,000	153,000	171,000	26,000	51,000	991,000
October	702,000	190,000	190,000	28,000	65,000	1,175,000
November	685,000	165,000	145,000	16,000	81,000	1,092,000
December	667,000	121,000	185,000	18,000	83,000	1,074,000
Total	6,015,000	6,989,000	3,238,000	291,000	709,000	17,242,000

NEW YORK

	New England	Export	Bunkers	Inside Capes	Other Tonnages	Total
January	183,000	....	439,000	......	706,000	1,328,000
February	130,000	....	318,000	......	561,000	1,009,000
March	114,000	....	350,000	......	601,000	1,065,000
April	112,000	....	381,000	......	484,000	977,000
May	103,000	....	339,000	......	514,000	956,000
June	99,000	....	408,000	......	485,000	992,000
July	103,000	....	377,000		413,000	893,000
August	117,000	....	313,000		563,000	993,000
September	85,000	....	263,000		569,000	917,000
October	142,000		255,000		658,000	1,055,000
November	97,000		222,000		582,000	901,000
December	63,000	1,000	218,000		545,000	827,000
Total	1,349,000	1,000	3,882,000	....	6,680,000	11,912,000

PHILADELPHIA

	New England	Export	Bunkers	Inside Capes	Other Tonnages	Total
January	51,000	77,000	44,000	199,000		371,000
February	28,000	60,000	29,000	136,000	1,000	254,000
March	20,000	73,000	47,000	158,000		298,000
April	26,000	54,000	53,000	142,000	1,000	276,000
May	46,000	62,000	55,000	164,000		327,000
June	44,000	108,000	36,000	170,000	1,000	359,000
July	46,000	62,000	43,000	139,000	......	290,000
August	49,000	81,000	51,000	157,000	......	338,000
September	43,000	12,000	24,000	157,000	......	236,000
October	58,000	35,000	37,000	196,000	2,000	328,000
November	62,000	25,000	32,000	183,000	1,000	303,000
December	46,000	21,000	28,000	164,000	......	259,000
Total	520,000	670,000	480,000	1,965,000	6,000	3,641,000

BALTIMORE

	New England	Export	Bunkers	Inside Capes	Other Tonnages	Total
January	73,000	170,000	55,000	82,000	3,000	383,000
February	50,000	92,000	42,000	67,000	1,000	252,000
March	86,000	95,000	41,000	91,000	3,000	316,000
April	87,000	116,000	51,000	101,000	1,000	356,000
May	69,000	253,000	59,000	62,000	....	443,000
June	72,000	388,000	60,000	54,000	....	574,000
July	79,000	316,000	65,000	52,000	1,000	513,000
August	82,000	82,000	30,000	91,000		285,000
September	91,000	37,000	31,000	96,000	......	255,000
October	85,000	28,000	19,000	96,000	7,000	235,000
November	97,000	39,000	25,000	87,000		248,000
December	100,000	31,000	31,000	113,000		275,000
Total	972,000	1,646,000	509,000	992,000	16,000	4,136,000

CHARLESTON

	New England	Export	Bunkers	Inside Capes	Other Tonnages	Total
January	....	24,000	4,000		10,000	38,000
February	....	33,000	3,000	1,000	4,000	41,000
March	....	43,000	2,000	1,000	4,000	50,000
April	....	15,000	1,000	1,000	4,000	21,000
May	3,000	27,000	......	......	......	30,000
June		64,000	4,000	......	4,000	72,000
July		55,000	4,000	......	3,000	62,000
August	....	23,000	1,000	......	......	24,000
September	....	8,000	3,000	......	3,000	14,000
October	....	18,000	1,000	......	......	19,000
November	....	9,000	1,000	......	......	10,000
December	....	7,000	3,000	......	......	10,000
Total	3,000	327,000	26,000	3,000	33,000	392,000

High Freights Handicap Utah's Coal Trade on Pacific Coast

By F. L. W. Bennett

Salt Lake City

High freight rates combined with foreign competition are proving a great stumbling block to the Utah coal trade on the Pacific Coast. Bunker coal shipments are down to zero, while other shipments are, roughly, only 50 per cent of what they were a year ago. The coal producers have appealed to the railroads to put the Portland rates into effect for shipments to Seattle, San Francisco and Los Angeles and there are hopes that this will be done. These rates range from $6.50 for lump to $5.50 for the inferior grades. The rates at present, except for bunker coal to San Francisco Bay which have been recently reduced to $6, are $7.25 a ton. When it is considered that coal can be sent from other parts of the world, and from the Southern States at $4 or $5 less per ton it readily will be seen that the Utah shippers have a hard struggle in meeting competition.

French Coal Trade Has an Uncertain Year; Feels Optimism "Based on Nothing at All"

Prices Hit Bottom During Fall but Demand Fails to Respond —British and Reparation Coals Glut Market Most of the Time—Some Mines Close Rather Than Try to Compete

By E. Cornand*

FROM the coal trade's point of view the year just ended was one which brought the most unexpected and, for the supplies of the country, the most unpleasant events.

American coal, which at the beginning of 1921 was still arriving in fairly important quantities, is gradually disappearing from the French market, and at present it does not look as if this trade had any reasonable chances of revival.

France opened 1921 with such huge surpluses of various kinds of coal that the government considered fixing the maximum price for American coal at $9 in order to check the influx. United States coal had declined rapidly in price from the flush and hectic days of the preceding fall when $39 a ton at French-Atlantic ports was common. On Jan. 1, 1921, the French stocks on hand totaled 4,500,000 metric tons[a]. On that date French coal was quoted at 124f. per ton, Sarre coal 110f.; German, 125f.; Belgian, 134f.; English, 196f. and American 195f. With a surplus of 4,500,000 tons, as compared to a surplus of only one-third that on Jan. 1, 1920, France began to look for a place to export some of its own production. Prices started down rather steeply. In May American coal in pools 5 and 7 reached Paris in small quantities at $10.50@$11.75. In the last few months British prices have been so low as to be positively dangerous to the French industry.

Reparation coal was coming into France steadily during the winter at a rate which astonished the French, whose chief worry was how to dispose of the flood. In February French railroad stocks were piled high, but in September they were higher. The February total of 1,121,272 tons came 445,508 tons from French mines, 192,207 English and American, 1,075 Belgian and 479,582 German. The railroad stocks on Feb. 1, and Sept. 1, were:

	February	September
State	139,400	272,500
North	159,488	168,265
East	138,824	151,246
P.-L.-M.	171,808	390,920
P. O.	221,325	272,895
Middle	62,046	55,900

In spite of the bulk on hand, imports into France in March were still high. The figure for that month was 1,348,132 tons as against 2,116,527 for January. In April it had dropped to 1,156,000 tons and in May to 775,000, of which 443,000 came from Germany, 127,000 from Belgium, 102,000 from Great Britain, and only 39,000 from the United States. In June imports bent upward to 957,000 tons and by August had reached 1,906,427 tons, but at lowering prices. By October imports were heavy again from Great Britain. The totals for that month were:

	Tons
Great Britain	777,645
Belgium	176,167
United States	20,745
Germany	393,170
Saar	115,147
October total	1,492,874

British coals, which at the beginning of the year were quoted around 60s. per ton f.o.b. can hardly be sold now at 25s. per ton for best Cardiff large. It must be added that the most unfavorable industrial conditions which prevailed throughout the year, and entailed a formidable decrease in the consumption of imported as well as home-produced coals, are largely responsible for the collapse of prices. To depict the situation exactly, however, it must be added that the French consumers had set their minds on buying only at their own conditions.

It had been hoped in England that subsidies to the miners could be recouped on the export trade. That was exactly what the French buyer did not want. Knowing that their English competitors were favored by a special inland price and that the unfortunate manufacturer dependent on imported coals would have to make this good by paying a special export price, the French industry simply decided to close down and wait for better times. Experience has proved that a holding off policy is the best means to bring the price of a commodity down to reasonable limits.

Home-produced coal has in many cases had a very hard time on account of the sharp competition with Belgian and especially with British coals. The effects have been bitterly felt for the last few months, especially by the northern French coal districts, whose markets are the most easily accessible to the competing foreign coals. Even now the owners are having a very hard time. On the one hand they have to reduce their prices to face the harsh competition of the British producing centres, and on the other hand is the special situation in the Nord, where cost of living is still much higher than in other parts of the country. This does not permit of reducing the miners' wages. Furthermore, the miners have a good trump in their hands—i.e., the certainty, if they leave the mines, of being at once taken up by reconstruction enterprises, which, it appears, are paying even higher salaries than those the miners get at present.

In other parts of France wages have been reasonably adjusted without too much trouble, except in the Southern fields, where the men threaten to go out on strike if there is any further talk about reducing wages.

But in spite of these vexations, home production has been strong almost all year, never falling below 2,000,000 tons a month during the first nine months of 1921. Production of French coal mines exclusive of the Saar and imports by months were as follows:

	Production	Imports
Jan.	2,427,588	2,116,627
Feb.	2,204,211	1,383,144
March	2,320,318	1,348,132
April	2,316,250	1,156,000
May	2,162,307	775,000
June	2,408,381	957,000
July	2,327,725	1,414,364
August	2,036,906	1,906,427
September	2,039,000	
October	———	1,492,874

Whereas France's production for 1920 was 20,348,020 tons, that total was exceeded in 1921 at the beginning of October. Rehabilitation of mining properties in the devastated areas had a marked effect upon production. In 1920 these collieries produced 8,449,665 tons, which was an increase of 19 per cent over 1919. During 1921 that percentage was increased. In six months ending last July twelve companies in the Nord raised 3,263,000 tons, which was more than four times their output during the corresponding months of 1920. The total production for September of the mines that had been nearly destroyed was 564,243 tons, which is between 55 and 60 per cent of their normal pre-war output. By the end of October the Drocourt mine had been opened again, though it had yielded but 82 tons. The Anzin mines now prouce 62 per cent of their normal yield. The Flines and Vimy mines remain unopened.

All in all business has been as low as possible; for the better part of the year the mines have worked only part time. It had been expected that after the exceptional summer there would be a particularly hard winter. Unfortunately, perhaps, for the mines, but fortunately for the numerous unemployed, the winter so far has been mild, and this, of course, also contributes to keep trade dormant.

German coals due under reparation

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*Manager, Office Commercial de Combustibles, Paris.

[a] The metric ton of 2,204 lb. is the unit of weight throughout this article.

agreements have arrived in smaller quantities lately. At one time they were encumbering the yards of the railways and other public works, but the small quantities now arriving are easily dealt with. Owing to the poor demand for coals, this reparation coal probably is something of a nightmare to the officials who have to attend to its disposal, as wherever they turn they find that consumers are not in the least anxious to take delivery.

In the Saar district the position, as far as output and improvements at the mines are concerned, has been unexpectedly good, but the difficulty now is to dispose of the coal. Stocks at the mines have increased constantly for the last few months. Desperate efforts are being made to insure the working of the mines. If the mines had to close down even partly for lack of outlet, this would be considered a political disaster. It should not be forgotten that this district will under normal circumstances be of the highest interest to France, and the government has realized that the best preparation for the plebiscite s to materialize the local natural wealth and create an atmosphere of satisfaction and welfare among the people.

With regard to this a French engineer, after several months of diligent research, has found a special process permitting the manufacture of first-class metallurgical coke from the coals of the Saar district, which hitherto have been practically valueless in metallurgy. The experiments are now being conducted on a big scale under government supervision. If the results are good this process will ensure a permanent and unlimited use of these coals to supply coke to the important French metallurgical industry in Lorraine. This will be a real godsend to that industry.

At this writing it is difficult to make any forecast for 1922. So much depends nowadays on so many unexpected events. The French industry is suffering from the same causes as the American and English. On account of the adverse rate of exchange, raw materials are high. So are foodstuffs. This entails high wages and an inevitably high price of the manufactured product. At the end of 1920 it had been hoped for various reasons which did not materialize that the year 1921 would see the end of all our evils, and at present France is in a position which again permits of the wildest optimism, based upon nothing at all except desire for improvement.

Vancouver Coal Output Drops

The coal mining industry of Vancouver, probably produced less in 1921 than in 1920, according to the observations of William M. Brewer, resident mining engineer. After a study of the mining situation and its recent developments he has this to say:

"The great importance of the coal-mining industry on Vancouver Island can be appreciated when it is considered that between 4,000 and 5,000 employees find continuous employment underground and on the surface, under normal conditions, the year through. Conditions during 1921 can hardly be considered to have been normal because the demand for coal has been quite irregular; so much so that the Harewood Mine at Nanaimo, of the Western Fuel Corporation of Canada, was closed down from the end of February until July, and the Pacific Coast Coal Co., which had a total of 286 employees during 1920, has been idle during the year 1921.

"The relationship between employer and employee in the Vancouver Island coal fields has been quite harmonious during 1921. In October the Canadian Collieries (Dunsmuir), Limited, renewed the working agreement with their employees for two years from that month. As compared with other industries the world over the conditions of coal mining on Vancouver Island have ben quite satisfactory, there has ben no unemployment to cause agitation and the balance between supply and demand with regard to labor has been well adjusted.

"During the past year the first really serious efforts were made to improve the method of washing coal so as to save a large proportion of the slack coal which has in the past been wasted. Successful experiments were made by P. E. Peterson, an acknowledged authority on the oil flotation method for concentrating metalliferous ores, in an attempt to apply that process to coal. The first experiments were made at the Granby No. 1 colliery at Cassiday, but later Mr. Peterson became connected with the Western Fuel Corporation of Canada, where he is now engaged in reconstructing the washery.

"The importation of fuel oil for locomotives and steam vessels, of course, has had a serious effect on the market for steam coal. The effect has been not only the direct one of reducing the demand for coal but the indirect one of sending hundreds of thousands of dollars out of Canada in payment for oil and exchange. In order to offset these undesirable conditions experts are working to determine the possibility of substituting powdered coal for oil.

Illinois Miners Exceptionally Well Paid

ILLINOIS mine workers make more than anthracite mine workers and more than the railroad men received under the decisions of the U. S. Railroad Labor Board. Even when the unsteadiness of the working opportunity is considered and allowed the average mine worker in Illinois makes more than the average railroad worker—$7.14 as against $5.78 for anthracite workers and $4.53 for railroad employees. It will be interesting to note that the railroad men expect an even further wage decrease. The attached table has been afforded us by a prominent Illinois operator. It will be recalled that the wage in the anthracite mines was purposely placed at a lower figure than in the soft-coal region because the work there was steadier than in the bituminous fields.

COMPARISON OF WAGES PAID IN BITUMINOUS MINES OF ILLINOIS WITH THOSE PAID IN ANTHRACITE MINES AND TO RAILROAD EMPLOYEES

Mine wage scale in Illinois as fixed Aug. 16, 1920 To expire March 31, 1922 Mine Employees	
Motormen (9 hrs.)	$9.04
(For 8 hrs. $8.04)	
Trip riders (9 hrs.)	8.43
(For 8 hrs. $7.50)	
Machinists	8.50
Blacksmiths	7 65
Blacksmiths' Helpers	6.86
Electricians	8 04
Electricians' Helpers	7 50
Carpenters	7.25
Track men	7.50
Track men's Helpers	7.25
Laborers, inside	7.25
Laborers, outside	6 86
Stationary Firemen	7 25
First Hoisting Engineers	8 04
Second Hoisting Engineers	7 65
Third Hoisting Engineers	7 45
See Note for averages	

Anthracite wage scale commission award April 1, 1920 To expire March 31, 1922 Relative Mine Service	
Motormen (8 hrs.)	$5.22
Trip riders (8 hrs.)	3 87
Machinists	5 32
Blacksmiths	5 35
No related scale shown	
Carpenters	5 24
Track men	5.34
Laborers, inside	4 86
Laborers, outside	4 20
Firemen	4 71
Engineers	4.98
Average earnings 16,175 men, compiled by Dept. of Labor	5 78

Wage scale fixed by U. S. Railroad Labor Board	July 20, 1920	July 1, 1921
Passenger Loco. Engineers	$6.48	$6.00
Through Freight Engineers	7.69	7.05
Local Freight Engineers	8.08	7.44
Passenger Loco. Firemen	4.98	4.50
Through Freight Firemen	5.89	5.25
Local Freight Firemen	6.02	5.38
Machinists	6.82	6.16
Blacksmiths	6.92	6.16
Blacksmiths' Helpers	5.68	4.32
Signal maintenance men	6.38	5.84
Signal maintenance assistants	5.34	5.44
Carpenters	5.83	5.76
Section men	3.70	2.72
Unskilled labor	3.95	2.72 to 3.44
Stationary Firemen	4.77	3.53 to 4.53
Stationary Engineers	5.55	3.97 to 4.75
Weighted average earnings of all employees	5.18	4.53

Note: Compilation for period Oct. 16 to 31 inclusive, 1921, for State of Illinois, covering 38,461 men shows the following earnings by classes:

	Machine Runners	Loaders	Day Men	Total All Men
Per day for 9.5 days actually worked	$11 55	$9 54	$9 81	$9 76
Per day for 13 potential working days	8 44	6 97	7 17	7 14

Per cent of voluntary absenteeism	10 7
Average union check-off, 2-week period	$2 23
Average union check-off per ton of coal	.0514

Despite Business Depression and Adverse Legislation 1921 Anthracite Output Approached That of 1920

Suspension of Washery and Dredge Operations Reflects Greater Improvement Than Figures Seem to Indicate—Total Decrease About 1,115,000 Gross Tons—Prepared Sizes Exceed 1920—Readjustment of Wages and Practice Indicated

BY EDWARD W. PARKER*

TOTAL PRODUCTION of anthracite in 1921 fell approximately 1,115,000 tons short of the 1920 total, because of a warm and industrially depressed December. But there was a difference in favor of 1921 that this statement does not show. In 1920, owing to the shortage of bituminous coal at consuming centers during a considerable portion of the year, the demand for steam sizes of anthracite was considerably in excess of normal, as a result of which washeries and dredges were actively engaged in the recovery of steam sizes from culm banks and river channels. The business depression of 1921, which has resulted in a notable decrease in the production of bituminous coal, has also been reflected in the partial or entire suspension of washery and dredge operations. Hence it is that while the total production of anthracite in 1921 was less than in 1920, the production of prepared or domestic sizes will show a gain.

The production of anthracite for the calendar year 1921 was about 78,917,000 gross tons against 80,032,175 gross tons in 1920 and an average for the ten years from 1911 to 1920, inclusive, of 81,227,010 gross tons. Of the total production of anthracite a little less than 90 per cent is shipped or sold locally, as approximately 11 per cent is consumed annually in the operation of the collieries. The following table shows the annual production, the colliery consumption, and the commercial or marketed product for the last decade. It will be noted that in addition to the two war years there were two others, 1918 and 1914, in which the output exceeded that of 1921:

TOTAL PRODUCTION, COLLIERY CONSUMPTION AND COMMERCIAL PRODUCTION OF ANTHRACITE FOR TEN YEARS, 1912-1921
(In Gross Tons)

	Total Production	Colliery Consumption	Commercial Production
1912.......	75,322,855	7,979,696	67,343,159
1913.......	81,718,680	8,581,694	73,136,986
1914.......	81,090,631	8,707,052	72,383,579
1915.......	79,459,876	8,925,486	70,534,390
1916.......	78,195,083	8,715,071	69,480,012
1917.......	88,939,117	9,321,965	79,617,152
1918.......	88,237,575	9,128,526	79,109,049
1919.......	78,501,931	8,576,850	69,925,081
1920.......	80,032,175	8,843,502	71,188,673
1921.......	78,917,000	8,800,000	70,117,000

The difference, economically, between anthracite and bituminous coal could hardly be more clearly set forth than by comparison of the statistics of production of these commodities in the year just closed. Bituminous coal is primarily an industrial fuel. In 1921 it showed a decrease in production, as compared with 1920, of one hundred and fifty million net tons, or practically 27 per cent. Anthracite, on the other hand, is primarily a domestic fuel, with relatively small percentage used strictly for industrial purposes. Its total production in 1921, for this reason, was nearer the normal mark than was the soft coal total.

The production of steam sizes will show a decrease of some 3,000,000 tons, all of which may be assigned to the shutting down of the washeries and dredges.

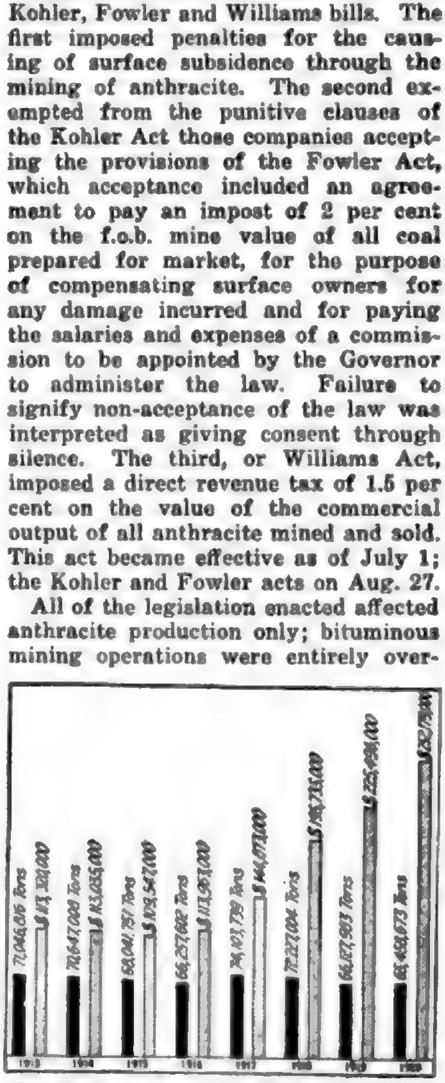
One of the interesting features of the anthracite industry during the greater part of 1921 was that the domestic sizes most in demand were stove and chestnut, the two most costly sizes, while egg coal, next highest in price, was in fair demand, and pea coal, the cheapest of the domestic grades, was at all times difficult to move and many thousands of tons were stocked in the storage yards. The steam sizes, in sympathy with bituminous coal, were in light demand throughout the year.

SPOTTY YEAR FOR ANTHRACITE TRADE

Taken as a whole the anthracite trade may be said to have been "spotty" during the entire year. The coal year, beginning April 1, found most of the domestic consumers with some supplies on hand, as the winter of 1920-21 had been one of exceptional mildness—a typical "open winter." There was not, in consequence, any late winter or early spring buying to speak of in order to eke out the winter supply. During the late spring and early summer egg coal was in good demand from relatively large consumers, who desired to lay in their requirements before closing their houses for the summer season. When this demand had been satisfied or the houses closed, stove coal became the only size in active requisition, due chiefly to the requirements of New England and the Northwest, both of which specialize on this size and both of which want their deliveries largely in summer, when water transportation is available. As summer drew to a close chestnut coal began to share the popularity of stove and by Nov. 1 most of this size that had found its way to the storage yards had been picked up and sent to market, egg coal in the meantime having fallen out of favor, and being like pea coal and the buckwheat sizes, decidedly draggy. The late arrival of real coal consuming weather added to the unsatisfactory character of the year's business as viewed from the standpoint of producers and distributors.

Market conditions were not the only difficulties with which the industry had to contend and which made the year 1921 one to be remembered. Politics played no inconsequential part among the disturbing elements, and there was an exceptionally plentiful crop of legislation, state and federal, proposed and enacted. The Governor of Pennsylvania was on the stage early in the game, and in January in his message to the Legislature recommended legislation imposing a tax of 8c. a ton on anthracite and 4c. a ton on bituminous coal. This eventuated in April in the passage of what are known as the Kohler, Fowler and Williams bills. The first imposed penalties for the causing of surface subsidence through the mining of anthracite. The second exempted from the punitive clauses of the Kohler Act those companies accepting the provisions of the Fowler Act, which acceptance included an agreement to pay an impost of 2 per cent on the f.o.b. mine value of all coal prepared for market, for the purpose of compensating surface owners for any damage incurred and for paying the salaries and expenses of a commission to be appointed by the Governor to administer the law. Failure to signify non-acceptance of the law was interpreted as giving consent through silence. The third, or Williams Act, imposed a direct revenue tax of 1.5 per cent on the value of the commercial output of all anthracite mined and sold. This act became effective as of July 1; the Kohler and Fowler acts on Aug. 27.

All of the legislation enacted affected anthracite production only; bituminous mining operations were entirely over-



PRODUCTION AND LABOR COST OF ANTHRACITE, 1913-1920 looked by the law makers. So far as known to the writer, the provisions of the Fowler Act were not accepted by a single anthracite operating company, and rather than incur the risk of being penalized under the Kohler law a number of mines whose workings extended under the City of Scranton were closed down on the day the law became effective, such action being strongly opposed by the mine workers and by the citizens of Scranton, who had been persistently active in procuring the legislation which produced that result.

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*Director, Anthracite Bureau of Information.

In October Judge Henry A. Fuller, of Wilkes-Barre, rendered a decision in a case coming before him in which he held the Kohler Act unconstitutional, the Fowler Act naturally falling with it. The matter has been appealed to the Supreme Court, but pending final adjudication by that tribunal, operations at the Scranton collieries were resumed on Nov. 2. An amicable suit to determine the constitutionality or unconstitutionality of the Williams Act was entered in the Common Pleas Court of Dauphin County at Harrisburg on Nov. 9. However the case may be decided in the trial court, this also will be appealed to the Supreme Court, and it is hoped that final decision in both cases will be had early in 1922. A law similar in essentials to the Williams Act passed in 1913 was declared by the Supreme Court to be in violation of the State Constitution.

No Advance Because of Mine Laws

No advance in price was made by the operators to cover the additional cost that would accrue if the acts should be held by the Supreme Court as not in violation of the State Constitution.

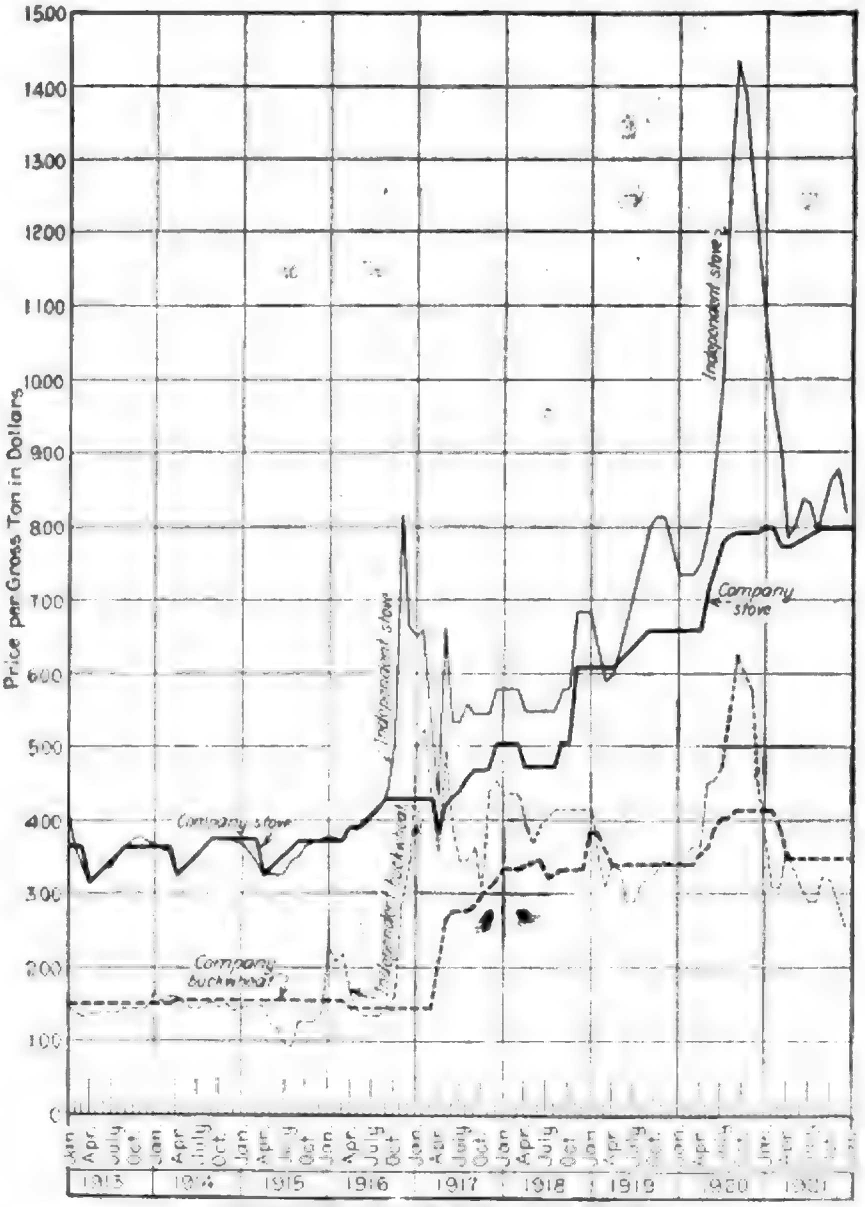
Attempts at Federal legislation, which may be numbered at something more than "several," have been less discriminating in their scope than the state laws and included both anthracite and bituminous coal in their beneficent intentions. The year 1921 had scarcely dawned before Senator Calder, of New York, whose personal interests and experience are in the building trades, introduced a bill (S. 4828) calling for drastic regulation of the coal-mining industry. Liberally amended in committee it was favorably reported to the Senate in February, but failed of enactment by the adjournment of Congress. But the extra session of the new Congress had hardly gotten well under way before Senator Frelinghuysen, of New Jersey, whose primary interests in private life are in the insurance business, introduced two bills, one providing for seasonal freight rates in order to encourage the more regular distribution of coal throughout the year, and the other for scarcely less drastic regulation than that originally provided by the deceased Calder bill. Senator Frelinghuysen endeavored strenuously to obtain favorable action on these bills, but opposition, led mainly by Senator Reed, of Missouri, developed and a resolution to recommit was carried. The testimony taken in the hearings on the Calder bill alone covered 2,235 printed pages.

Undismayed and undeterred by the fate that had befallen the offspring of his colleagues, Senator Kenyon, of Iowa, in October introduced a bill of even more radical and drastic character than its predecessors. No further action than its reference to the Committee on Manufactures has been taken on this bill. Other bills of similar import have been introduced in the lower house of Congress, but these are sufficient to indicate the ambition that seems to exist in the minds of some of the members of Congress to have their claims to fame based up the authorship of legislation having for its ultimate design governmental control of the coal-mining industry. The majority sentiment in Congress, however, appears to be in sympathy with the President's plea for less, not more, government in business.

Of prime interest and importance to the future of the anthracite industry were the decrees of the Supreme Court of the United States ordering definite separation of the railroad and coal-mining interests in the "Reading" and "Lehigh Valley" cases. In accordance with these decrees plans for the segregation of the properties have been submitted, but in the case of the "Reading" properties appeal has been taken because of disagreement between the preferred and common stock owners as to the manner in which they shall participate in the division.

The "Reading" decree ordered also that the Central Railroad of New Jersey, controlled by the Reading Company, dispose of its holdings of stock in the Lehigh & Wilkes-Barre Coal Co., of which the Central owned 92 per cent. This sale was effected in November, a syndicate composed chiefly of First National Bank (N. Y.) interests, and Burns Brothers, being the purchaser. In line with these transactions was the sale in September of the coal-mining properties of the Delaware, Lackawanna & Western Railroad Co. to the Glen Alden Coal Mining Co.

Although no labor disturbance of a



ANTHRACITE PRICES FOR NINE YEARS

This diagram shows in dollars per gross ton the average company circular prices and average spot quotations on "independent" stove and buckwheat sizes of Pennsylvania anthracite at the mines. The prices shown are averages of the range on the New York market as recorded weekly in COAL AGE.

sufficiently general character to affect materially the production for the year has occurred, advantage has been taken in a number of cases of somewhat flimsy pretexts to cease work. Probably the most flagrant instance of this character was a suspension of work for a period of three weeks by some 7,000 employees of the Lehigh Coal & Navigation Co. in the Panther Creek district in protest against the employment of certain laborers on the ground that they were Spanish and Portuguese and could not speak the English language though precaution had already been taken by the union to see that they had joined the organization and were provided with cards and buttons. The laborers were not discharged and after a "vacation" of three weeks and a sacrifice of some $750,000 in wages, the men returned to work.

Internal union politics was responsible for several occurrences of idleness among the employees of the Pennsylvania Coal Co. in the vicinity of Pittston, but the shutdowns were not of long duration.

PROPAGANDA A DISTURBING FACTOR

The most disturbing factor in the labor situation has been the dissemination throughout the entire anthracite region of inflammatory literature and propaganda by the I. W. W. and kindred influences, though to what extent the seed so sown has taken root it is not possible as yet to determine. Preaching the gospel of discontent is a comparatively easy matter when times are hard and labor unemployed or underpaid, but when labor is prosperous, as it is in the anthracite region at the present time; when it is overpaid as compared with and at the expense of like employment in other industries and other communities, and when it is given regular and steady employment throughout the year such as is enjoyed by workers in few occupations, the lamentations and exhortations of the preachers of the spirit of incendiarism are apt to fall on inattentive, if not entirely deaf, ears.

With the foregoing exceptions most of the troubles with labor were of a minor character, resulting in idleness of but from one to three or four days, the grievances on which they were based being amicably adjusted with the mine officials, or referred, after the disaffected employees had returned to work, to the Anthracite Board of Conciliation.[*]

As to the future—what may be the outcome of the necessary readjustment at the termination of the present agreement, March 31, 1922, of the inflated labor cost, in response to the insistent and justifiable demand on the part of the anthracite-consuming public for a reduction in the cost of its fuel supply, no one is prepared to say. When it is considered that in 1913 71,046,816 gross tons of fresh-mined commercial anthracite were produced at a labor cost of $113,320,000, and that 65,458,673 gross tons in 1920 were produced at a labor cost of $252,129,000; when it is considered that the index number of the cost of living in November, 1921, shows a decrease of 40.7 points from the peak cost in 1920,[†] on which the anthracite wage scale of the existing contract was predicated; when it is considered that the farm prices of food products have fallen in some instances to practically pre-war levels; when it is considered that common, unskilled labor in the anthracite industry is being paid 52.5c. an hour, and similar labor in other industries, in the same locality, is receiving from 25 to 35c. an hour (that is, anthracite labor is getting from 50 to 100 per cent more than other workers who must buy the product of anthracite labor); when all of these are considered, it is apparent that deflation in the labor cost of anthracite is absolutely necessary.

LABOR COST IN PRODUCING ANTHRACITE

The report of the Federal Trade Commission (June 30, 1919) on anthracite shows that the labor cost for fresh-mined anthracite in 1913 was $1.595 a gross ton for companies producing about 50 per cent of the total output, while in November and December, 1918, the labor cost for companies producing about 99 per cent of the total was $3.41. The labor rates for the entire year 1919 and for the first three months of 1920 were the same as for the last two months in 1918, and from April 1 to Dec. 31, 1920, the increase (17.4 per cent average) granted by the award of the Anthracite Coal Commission was in effect. Assuming that the efficiency of labor remained about the same, the average labor cost in 1920 would have been at the rate of $3.85 per ton, or a little above the mine price for chestnut coal (the highest price grade) in 1914 and 1915. The accompanying diagram shows graphically the rather startling manner in which the labor cost increased from 1913 to 1920, while the production has declined, the output of fresh-mined anthracite in 1920 being the smallest of the eight years covered by the diagram. It is to be noted that only fresh-mined commercial anthracite is considered in this illustration. Colliery consumption and coal recovered from culm banks and stream beds by washeries and dredges are not included.

CHEAP MINING OF ANTHRACITE PAST

The most serious problem concerning the future of anthracite, however, though not a problem of so instant a character as that of cost and price deflation, to be considered in the spring of 1922 is that of providing for a constantly increasing population from a limited, and from what must become in a few decades at most, a diminishing supply. Cheaply mined anthracite is rapidly passing into history. It has in fact passed. In order to maintain production at its present rate attack has to be made, and will continue to be made, on the thinner and deeper beds, operations even at the present time being carried on in beds which under conditions that obtained at the time of the Anthracite Coal Waste Commission report (1893) were not considered among the available reserves, while other operations are being conducted on properties that were then considered as worked out and abandoned.

BONANZA BEDS NEARLY EXHAUSTED

The bonanza beds that produced the cheap coal of the last century are approaching exhaustion. As the workings extend to the deeper beds, more support has to be given to the gangways and working places, more water has to be hoisted and to greater heights, more ventilation has to be provided, and more labor and mechanical equipment per unit of output has to be employed. The thinner beds will not yield the same tonnage for the labor employed upon them as have the thick beds that produced the cheap tonnage of the past. So whatever may be the base level arrived at in regard to labor rates and cost, Nature has ordained that the mining of anthracite in the future must be, for the region as a whole, at a steadily increasing cost per ton of output. To regard the rate of increase and to maintain the expense of production at an irreducible minimum, in order that the cost to the consumer may not become prohibitive, every energy that managerial ability and engineering skill can command is being devoted.

The shipments of anthracite by months in 1920 and to the end of November, 1921, are shown in the following table:

	1920	1921
January	5,713,319	5,740,438
February	4,913,664	5,966,101
March	6,077,821	5,737,771
April	4,814,211	5,967,465
May	6,155,878	5,793,895
June	6,319,957	6,031,937
July	6,389,100	5,462,768
August	6,207,653	5,575,115
September	3,592,954	5,519,412
October	6,240,901	5,872,783
November	5,765,347	5,314,014
December	6,436,320	4,635,922
	68,627,125	67,617,713

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[*] Since this machinery for the adjustment of labor disputes in the anthracite region was set in motion by the Anthracite Coal Strike Commission of 1902-3, more than one thousand grievances (1078 to be exact), have been adjusted and no general strike has occurred, the outlaw "vacation" strike in September, 1920, for the purpose of registering dissatisfaction with the award of the Anthracite Coal Commission of that year being, as indicated, unauthorized by the union officials and not participated in by as much as 50 per cent of the mine workers. The Board of Conciliation will not consider a grievance while the men or mines are idle because of it.

[†] In July, 1920, the cost of living was 104.5 per cent above that of July, 1914; in November, 1921, it was 63.8 per cent.

New England Bituminous Receipts During Recent Coal Years[*]

(In Thousands of Net Tons)

Year.	Tide and Rail.	Tide.	Rail.	Per Cent. Tide.	Per Cent. Rail.
1916-'17	23,313	13,707	9,606	59	41
1917-'18	23,376	12,253	11,123	52	48
1918-'19	25,293	15,085	10,208	60	40
1919-'20	19,089	9,092	9,997	48	52
1920-'21	22,142	9,673	12,469	44	56
1921-'22[†]	11,397	6,050	5,347	53	47

[*] Courtesy Massachusetts Fuel Administration.

[†] Eight months.

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BANCROFT WASHERY, ASHLAND, PA., SHOWING CULM AWAITING RECOVERY*

Despite Irregular Operation of Union Bituminous Mines Coal-Mining Technique Progressed Greatly in 1921

Activity of Non-Union, Anthracite and Consumer-Owned Mines Compensated for Inactivity of Union Soft-Coal Operations—Increased Use of Belt Conveyors —Advances in Anthracite Preparation—Air Washers—Timber Preservation

BY R. DAWSON HALL

IN most of the great national industries the year just past has not been by any means a year of progress. Retrenchment and stagnation have been the beggarly orders of the day. Unfortunately this has been true also of a large part of the bituminous coal industry. One section of that industry, however, gained marvelously in 1921 over 1920. Some plants did 100 per cent more business; others 200 per cent. The mines ran almost without let-up. Men were hired, machinery was purchased and installed and profits were made enabling the firms to make preparations for further development.

These more fortunate plants had in 1918 produced 150,000,000 tons. The output in 1921 is not yet a matter of record, but they doubtless produced far more than in that bonanza year; they are the non-union mines of the country. Men were leaving the union mines and flocking to the non-union. The prospect of a strike in April of the coming year has made the non-union operators confident that they face a continuance and even an increase of prosperity in the coming year. Consequently they are preparing to back their good fortune with adequate resources. They do not want to meet opportunity with too small a basket.

The anthracite region also has been working steadily and the year 1921 was doubtless every bit as good as the year that preceded it. An independent company or so was forced out of operation, but with this unimportant exception all the companies kept steadily at work. Only in the early spring and the latter part of the year was there any weakening in the market.

The technical development of 1921 was aided not only by the peculiarly favorable condition of the non-union mines but by the general tendency of large coal consumers to open up-to-date operations, thus themselves becoming large producers. No mines are more up to the minute than those of this character. Among these may be mentioned the Lynch mine in Kentucky completed by the United States Coal & Coke Co., the Springdale mine of the West Penn Power Co., and the Schoper mine of the Standard Oil Co. of Indiana. On these big plants it is somewhat perilous to set a specific date, for in these days a year or years may elapse between their initiation and completion.

In the Connellsville region, which is a non-union section and largely owned by big consuming interests, changes are expected to take place involving some millions of dollars, owing to the fact that whereas no one plant found it profitable under the old conditions to produce more than its ovens could turn into coke, now the coke, being made at the consumers' steel plants, may be derived from coal from any of the mines in the region. In consequence it is possible to consolidate producing units and thus gain the advantage of large operation.

The anthracite region was for many years in the hands of interests which were disposed to follow the lines of operation and preparation laid down by earlier practice. In recent years a change has taken place and great expenditures have been made toward electrification, and though that progress is continuing and will continue, the principal trend today is toward utilization of new methods of preparation, especially in regard to fine sizes, some of which are scarcely salable but must be impounded if the streams are to be kept free of pollution. Significant among experiments in this direction are those made at the Old Forge plant of the Pennsylvania Coal Co., where the

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*Without careful cleaning these fine sizes cannot hope to sell year in and year out in competition with anthracite. Cleaned, however, an immense increase in sale will be possible, for with self-feeding furnaces the coarser of the buckwheats can be used and with suitable draft the finest of sizes if clean can be burned satisfactorily under steam boilers. Anthracite is the only truly smokeless fuel and even when fine should command a good price.

STRIPPING PLANT OF A LARGE ANTHRACITE CORPORATION

This scene is somewhat typical of anthracite strippings, where the difficulties are so great that it would naturally be thought that the largest machinery would be used. The overburden has to be entirely removed, yet for this work large equipment has rarely been purchased and put in use.

clarifying of washery waters by electro-precipitation has been tested with excellent results.

More important are the means being adopted by the Hudson Coal Co. and the Philadelphia & Reading Coal & Iron Co. to prepare on tables the finer sizes of anthracite, which must be cleaned if they are to become more readily salable. Some will hold, however, that the method of the Chances installed at the breaker of the West End Coal Co., in Wilkes-Barre, is the most important development of the year. It greatly simplifies preparation by the washing of the whole mine product without preliminary sizing. The large and the small are separated satisfactorily by gravimetric methods in a fluid having a specific gravity equal to that of coal of the required quality, the water being made dense by the admixture of fine sand which is kept in suspension.

It is by no means certain that such fine sizing of anthracite as is practiced is demanded by the market except indirectly as a means of fitting the coal for jig washing. With the washing in jigs eliminated it may not continue to be customary to make so many sizes, for in the screening no little degradation takes place. However, if the screening is to be conducted with the purpose of producing the same number of sizes as at present, it is a gain to have the slate removed first because the presence of that material makes longer screens necessary and causes more degradation, not only by reason of the greater screen length but because its weight tends to break the coal, which, small enough to pass partly through the perforations in the screen, fails to clear the openings entirely or with sufficient rapidity.

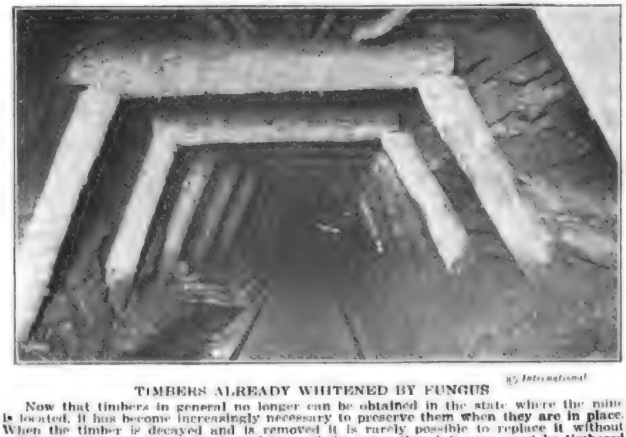
Experiments have been made by the Hudson Coal Co. with the Conklin washer, which operates, as does the Chance separator, by gravity, the densifying medium being finely comminuted iron ore. One company is investigating an English washer which has been quite successful in reducing the ash in a certain Welsh anthracite to less than 2 per cent. That particular anthracite is known to be exceptionally pure, however. An American metallurgist has a process which promises well, but as the foreign patents are not yet filed nothing specific may be said as to this development. It is clear from what has been said that the progress of invention in the anthracite field is by no means at a standstill. The year 1922 will certainly see some changes in practice, though they may not be generally adopted for several years.

Details of Donald Markle's process of coking anthracite fines with pitch have been given to the public during the year. The product, which is known as anthracoal, has been put into domestic use on a small scale. The commercial value of the process has yet to be proved by large-scale production.

Strange to say, stripping in the anthracite region does not show a disposition to advance in its methods as rapidly as has bituminous-coal stripping in the United States and in the Siberian concessions of Japan. Lignite stripping in Germany also has shown more aggressiveness than anthracite stripping in this country. There are a few exceptions, it is true, but the dinkey engine, the small-size steam shovel, the light dump car and the mine wagon are still putting up a vigorous resistance owing to the anthracite practice of letting out stripping work to contractors of relatively small means.

Though many appliances are just as well suited to the anthracite field as to the bituminous and it is merely the hand of fate that makes the anthracite field develop one device and the bituminous another, it is so customary to adopt this segregation that I fall as have others under its baleful influence. There is, for instance, a method of separating mineral from gangue, or heavy seeds from light seeds, that has found its entire application as regards coal in the bituminous fields, yet it has no less applicability in every probability to the preparation of anthracite. I refer to the air washer. It is just as important to bring fine anthracite to the boiler furnace free of water as it is to bring slack to the bituminous-coal stoker in the same condition. It is just as essential to transport anthracite in the winter without possibility of freezing as it is to ship bituminous coal under conditions such that it cannot be frozen. Thus the air washer described by General O'Toole in a paper before the Iron and Steel Institute is just as well suited to all parts of the coal field as to the bituminous, recognition of that fact being accorded by D. C. Ashmead in his communication to the American Institute of Mining and Metallurgical Engineers entitled "The Preparation of Anthracite."

It will be remembered in this connection that the washing table found its first application to coal mining in the bituminous fields, being adopted by the Colorado Fuel & Iron Co., the Stag Canon Fuel Co., the United States Fuel Co., and possibly the Renton Coal Co., before it received consideration in the anthracite field. The same is true of



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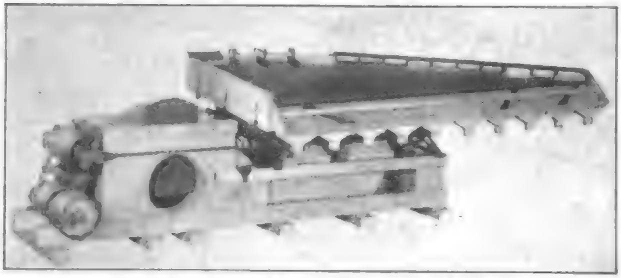
TIMBERS ALREADY WHITENED BY FUNGUS

Now that timbers in general no longer can be obtained in the state where the mine is located, it has become increasingly necessary to preserve them when they are in place. When the timber is decayed and is removed it is rarely possible to replace it without a fall of roof which has to be cleaned up, and the space thus left open must be timbered by additional material; hence the cost increases from year to year. For this reason the timber should be treated or steel, gunite or concrete posts substituted.



THE AIR-WASHING TABLE IS A DRY CLEANER

Two companies are now manufacturing tables which use air for the purification of mineral substances from what mineralogists call "gangue." Adding water to coal is an unintended, but no less real, adulteration of fuel with a material that is not merely inert but actually deleterious for it has to be driven off by heat and is liable to freeze in the cars and make trouble.

pulverized coal, roller bearings and the self-dumping cage.

Following precedent, however, I turn to the bituminous fields as to a different department of development. In those fields the rotary or revolving dump, the skip and the picking of coal before weighing are receiving renewed attention and acceptance. The long rotary dumps for many cars, it is true, may not be installed in increasing numbers. They had their main applicability where large quantities of coal had to be stored for use in coke ovens of the beehive or rectangular types. They are of less advantage and may well be undesirable where the coal has to be loaded into railroad cars.

The long rotary dump arrived contemporaneously with the byproduct coke oven and if it survives the old-style coke ovens it will be for uses to which it has not been adapted at present. However, one may be permitted to wonder whether it would not have found application at the Schoper plant with its 360-ft. two-track bin had the bin been fed by slope or drift instead of by shaft.

But the rotary dump, both as an ordinary tip and on self-dumping cages, continues to have its development. The Twin Boy Automatic Dump of the Anniston Electric Steel Corporation is a new development in which the loaded car in revolving on its carriage brings up another carriage on which is a car just dumped. This empty car runs off the dump, to be replaced by a load which tips over, bringing up the first car mentioned which has by this time discharged its load. Thus the loads furnish the power by which the dump is operated.

As to the use of the skip, a recent development is the two-compartment hoist, which makes it possible to bring up the coal from each mine car in a separate receptacle so that after separate picking the coal can be weighed and each man credited with the clean part of the coal he has loaded. A further refinement may be introduced by which the slack will be weighed separately from the large coal and the miner paid at a different rate for each class of fuel.

At the mines of the West Penn Power Co., or rather of its subsidiary, the Allegheny Pittsburgh Coal Co., where the separate weighing of each man's coal is provided, all the coal goes to stokers and no reason for separate weighing of large and small coal exists. Moreover at present there is no scale which differentiates between sizes. When it is established, if it ever should be, one reason for the overtopped coal with its disadvantages (and advantages also) will be removed and perhaps it will disappear. It certainly is the cause of the distribution of much dangerous coal dust along the roadways.

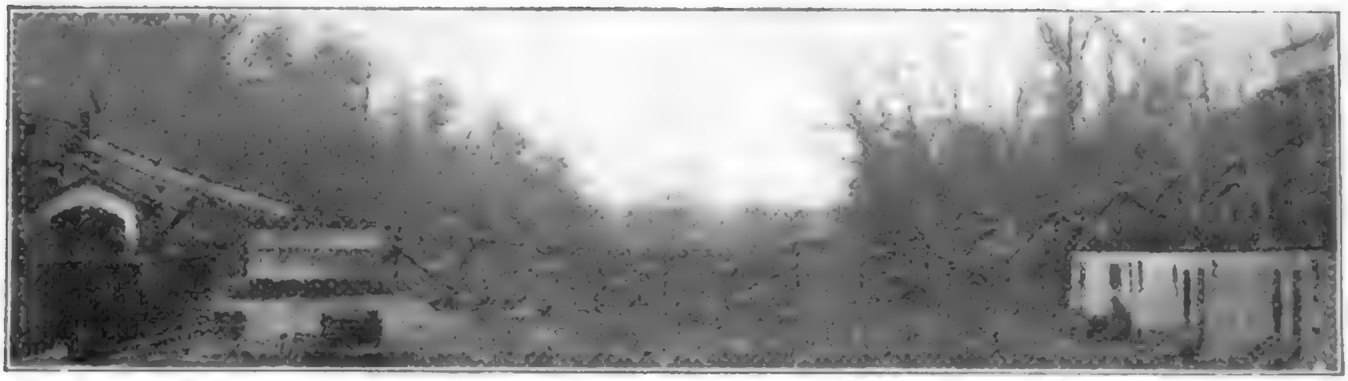
One interesting development is the increase of the use of belt conveyors. They labor indeed under the disadvantage of being of limited length, but some improvement in this direction may be made when roller bearings are used and friction accordingly reduced, decreasing thereby the pull on the belt. Metallurgical practice the world over has favored the use of belting for conveying purposes. British coal equipment has made much use of such belts. Why the coal regions of the United States have questioned the utility of such means of conveyance has long been inexplicable. During the year past many evidences of a tendency to recognize the merits of belting for transportation have made themselves apparent. Imitation has done what argument failed to accomplish or, rather, imitation has completed what reasoning and experience first put into practice.

This development is a further exemplification of the fact that American coal men borrow from American coal men and refuse to heed the experience of the metal industry and the practice of coal men of other nations. At one mine a belt has obviated the necessity for a short plane. At the Marvine colliery two belts carry the whole product of a colliery a distance of 1,100 ft. from a crusher house to the Marvine preparator. At Prestonsburg, Ky., a belt carries the entire output of a mine across the Big Sandy River. Belting is being used on a loading boom for river boats. It is carrying coal from bins to railroad cars and it is somewhat generally used to take coal from tipple to bins.

The many uses cannot here be amplified, but well-substantiated rumors are

BITUMINOUS STRIPPING EQUIPMENT

When equipment of this size is used in the anthracite region large locomotives and big cars will be necessary, but when they are installed there will doubtless be such a revision of standards as will make the practice universal. The anthracite region suffers from the fact that it already has equipment and long experience, and the bituminous region is to be congratulated that it was possessed of neither at the time when it started stripping.



LONG RUBBER BELT, GOULD MINE OF BERTHA COAL CO. ON PETERS CREEK BRANCH OF PENNSYLVANIA R.R.

The whole output of the little 35-acre mine, the head house of which is seen on the right, is delivered by a belt which rests on the light trestle also shown in the illustration. The length is about 224 ft. and the fall from mine tipple to railroad tipple is about 20 ft. The steepest grade on the conveyor belt is 18 deg.

that a conveyor system 7⅛ miles in length will connect Colonial No. 1 mine at Smock, Pa., with Colonial Nos. 3 and 4 and with the Alice mine on the Monongahela River at Brownsville, Pa. All these are properties of the H. C. Frick Coke Co. The grades will average about 3 per cent. The units will be arranged so as to have a slight drop from one to the other in the direction of progress as the shingles on a roof, yet without overlap. The belts probably will be 4 ft. wide.

Curves will be negotiated, it is said, by short belts 100 ft. long or less. Troughing idlers will be used on the upper side and flat bearers on the under or return side. To reduce the peak load the conveyor will be started after a shutdown by an arrangement that will provide for the switching on of the units progressively, beginning at the unit furthest from the mine. The coal will come from at least four mines and will find ultimate lodgment in barges on the river.

Such developments in the use of belting will be quite a strain on the rubber market should they become common, and it is cheering to know that other types of belting are available. Other industries have been using balatta belts and now appears a new belt, the Lion's Paw, which seems to have the merit that some substitutes do not have of being as good as, or better than, the materials for which it is substituted.

The development of the coal cutter during the year has not been remarkable. The new Oldroyd machine should, however, receive recognition as part of the year's development, and it should further be added that the cutter bit is now being improved, thus shortening the cutting time and, what is more important, at least to the operator, the power consumed in the operation. The time lost in moving from room to room is so considerable that the cutting time has lost some of its significance. The power losses are less easily overlooked. The Sullivan bit sharpener has been designed to make perfect bits at minimum expense. Too much muscle and too much intelligent artisanship are wasted in bit sharpening. It is a repetitive job well suited to a machine and therefore ill-suited to manual labor.

The loading machine has developed new forms, and the number now on the market is legion. Among the machines chronicled this year in *Coal Age* are the Brown, the Hunt, the Automotor and that being built by the American Loading Machine Corporation. Among little-known machines now in use in the metal field are the Horr and the Keystone, the John Mayne, the Cole Goudie, the Conweigh digger belt loader and the Conweigh shovel loader. The Shoveloder seems to have found considerable favor at such work as is suited to its operation. A readily portable, strong machine of low cost, it has merits that make it peculiarly fitted to narrow work, to which function it is by no means restricted.

Attempts are being made to fit the mines to the loading machine. One of the drawbacks to machine cutters and loaders is that, as they have to destroy the walls of the factory in which they work, they cannot be operated as continuously and successfully as can a machine to which the material to be worked is brought or as farm machinery, which operates in the open air.

Tractor plows and like equipment have never been suited to countries with small farms. In like manner coal-cutting and loading machinery is ill-adapted to narrow places such as entry, room and pillar work afford. Longwall and sidewall workings are the only correctives and they are not without drawbacks, which must, however, be overcome if the best results are to be attained. The Strange scoop shovel, which gets under the coal with a blade that lifts when the shovel has been loaded and acts as a tail gate to hold the load in place, has advantages that will recommend it to the public. It is a new development that may be credited without much qualification to the year just past.

As the year 1921 grew old it became increasingly doubtful how large an area of the bituminous coal field would still acknowledge the aegis of the labor union. If a large break in the union ranks should occur it will certainly favor the introduction of machinery. The union has compelled the operators who provided mechanical devices for the mining of coal to accept such small differentials as to leave in many cases little or no profit in the use of such equipment.

Moreover, where machinery has been employed the union has not been willing to rearrange the piece rate whenever improved machinery was provided. It is the readjustment of the piece rate with each increased possibility of output that has caused the rapid cheapening in the manufacture of articles for public consumption. This progress has been denied to the coal industry. Operators have at times bought antiquated second-hand machines simply because under the schedules of the union the scale for work done with such machines was as low as that achieved by the use of better equipment.

In the union fields miners have expended the most heart-breaking toil drilling coal with a hand auger rather than concede to the operator a few cents for performing that work with a suitable and more adequate power driven tool. Progress is halted also in face conveying and shovel loading in the same manner until some have felt that if the union is to prevent the formation of a reasonable piece-work scale for lightened labor it will be necessary to do the work by daymen with all the disadvantages the day-work system involves.

If in the coming year the non-union area enlarges, or the union becomes less arrogant and unreasonable, the year may see a great advance in machinery such as will make the work of miner and loader easier, more remunerative and more effective. It is too early to prognosticate just to what extent the change will come. All we know is that 1922 will see the union lose much of the hold it gained during the war, and the result inevitably will be the extensive introduction of better equipment by firms that can finance such an undertaking.

The year 1922, [illegible] think, will show a somewhat different attitude toward electrical apparatus than those which preceded it. Engineers and operators will not be so much disposed as in the past to use large units for power production. They will feel that such units are not suited to an industry that has long periods of irregular production when the machinery must be run for pumping and ventilating and some minor purposes but run on extremely light load. They will want units so small and so numerous that they can let some of them stand when demand declines, and they will want also more and more to save their charges for current by making their machines automatically close down when not doing useful work or by so fitting them that they can be closed down from some distant point. More starting and other protective devices such an automatic reclosing circuit breakers, tie breakers, bearing thermostats and relays will be installed. It is being realized that the mines and the electric apparatus need protection both for economy and safety.

During the past year two storage-battery locomotives have been fitted with such a degree of protection against gas that they have been declared permissible by the U. S. Bureau of Mines. One of these locomotives is manufactured by the George D. Whitcomb Co. and the other by the Jeffrey Manufacturing Co. A locomotive equipped both for trolley and battery operation has been developed by the Ironton Engine Co. Separate motors of characteristics suited to each source of energy have been provided, thus both operate at maximum efficiency and the locomotive has a flexibility not available where either the trolley or the battery is exclusively relied on. Whichever motor is being used a worm drive provides that tractive effort shall be applied to both axles.

Timber preservation, of necessity, moves a little slowly. It serves no really useful purpose until it has been in use a year or more. Then the operator who has introduced it begins to realize its benefit. It increases the timber charges of one year to reduce those of the years that follow. But until the year or more years are past the operator cannot feel any practical assurance of results and is not able to testify to any advantages received.

Coal mining has been too much a hand-to-mouth proposition and operators have not looked far enough ahead. That and the proneness of mine owners to wait until a device has been tried and shown to be valuable have delayed the preservative industry, for nothing can be proved until the period of proving has elapsed. Yet, despite that fact, timber preservation has advanced steadily. Those who have tried it are enthusiastic. A new preservative has invaded the field—Aczol. Years of experience in Belgian mines are behind it, where it has been tested under trying conditions.

Aczol, being made of ammonia, copper oxide, zinc oxide and phenol, builds in the fibers of the wood non-putrescible compounds which strengthen the timber and lengthen its life.

Coal Industry Must Withstand Spotlight During 1922

Public Interest in Basic Commodities Increases—Rate Cut of 15 Per Cent Expected—April 1 Strike Now Doubtful—Union Would Accept Short-Time Wage Cut—Court Action Vital This Year

By Paul Wooton

Washington Correspondent of *Coal Age*

DESPITE the earnest wish of many engaged in the coal industry that their business be allowed to return to the obscurity that once surrounded it, it is evident as the year begins that the coal business must be conducted during 1922 in the full glare of the limelight. In the evolution of business conditions there is certain to be increasing public interest in the basic commodities, in the opinion of disinterested economists.

Two developments of far-reaching importance are expected early in the year. They are the reduction in freight rates and the writing of a new wage agreement. The coal industry is going before the Interstate Commerce Commission with carefully prepared comment. The operators, the wholesalers, the retailers and the consumers are to be heard. Relatively generous allotment of time has been given the coal industry due to the fact that it constitutes a large portion of the total tonnage carried by the railroads and because of the basic importance of this commodity to a large number of activities. It is known even before the conclusion of the hearing that a reduction of at least 15 per cent in freight rates is likely to be in effect by the beginning of the new coal year.

From this time forward there will be an increasing interest in the labor situation. While the chances of a strike have decreased somewhat during the past few weeks, everyone recognizes that a serious situation is faced and that it is pregnant with unfavorable possibilities. The mild winter and the continuance of the business depression are exerting powerful pressure in reducing the chance of success in case of a strike, thereby making a strike less likely. However, a slim reserve in the bituminous workers' union treasury may be no deterrent. The anthracite workers—never more prosperous in the history of the industry—have offered aid. This may offset the disadvantage of the financial situation among the bituminous workers.

PAUL WOOTON

It is recognized that a strike would be a boon to the non-union fields with all the chances favoring a deluge of highly organized territory with coal. Under present conditions the morale of many union miners would tend to wilt under strike conditions with the probabilities favoring a considerable exodus to non-union and outlying fields.

It is pointed out that the matter would be simplified greatly if the wage agreement were for a few months. As long as conditions remain as they are there is a general belief that the union would accept a material reduction in wage, but with the prospect of more prosperous times before the end of the two-year agreement there is certain to be a real fight against accepting any cut for the full period.

Considerable satisfaction is being evidenced by the prospects for the non-union fields. Regardless of the reduction that may be put into effect, a lower rate, which still would be attractive to the mine workers, can be fixed in the non-union fields because there is the compensating advantage of regular employment.

Legislators on Capitol Hill are discussing this situation and are fully alive to its importance. Now that the spell which labor exercised for so many years has been broken, politicians no longer fear to express their real convictions on labor matters. Prompted by the report soon to be submitted by the Senate committee that investigated the West Virginia disturbance, Senators and legislators are certain to have much to say in the near future concerning union activities. Further discussion will result as the date approaches when the existing wage agreement expires.

Members of Congress who are anxious to bring about a condition which is for the best interest of the entire public are wondering if all concerned would not be benefited if the unionization of mine workers took the same form as does the organization of most other trades. Among the building trades, for example, there is a type of local competition which many believe is in the public interest. In every community there are non-union contractors. The tendency is for the more skilled, and consequently better paid, workmen in any given trade to keep up a union affiliation, but the fact that there are non-union jobs going in the same community is thought to have a very wholesome effect for all concerned, particularly the public. Since each member of Congress is familiar with that situation, many are wondering if it would not be better if there were a few non-union mines in each coal-mining section throughout the now solidly unionized territory and a proportion of unionized mines in the territory now solidly non-union.

Contact with Senators and Representatives who have not given specialized attention to labor matters makes it clear that there has been no crystalization of thought as to just what the public should expect from labor and from employers, but during 1922 this matter is going to engage the thought of legislators more than ever before.

HARDWOOD CASE WILL AFFECT COAL

The opinion rendered by the Supreme Court of the United States in the Hardwood case will requre that the coal industry orient itself to a new situation. Justice Holmes, in his dissenting opinion, says the majority decision affects the collection of information as to production, prices and stocks. There is great difference of opinion among lawyers as to the scope of this ruling of the nation's highest court. It is certain that business will not be content, as it once was, to proceed without that definite and basic information necessary to its intelligent conduct.

The Hardwood opinion may pave the way for legislation defining the manner in which trade statistics may be gathered properly. Some are of the opinion that a coal exchange will meet the new conditions. Others think that the government will become the clearing house for information that must be gathered from individual operations.

The combined effect of the Supreme Court's ruling and the business depression is certain to encourage in a definite way the consolidation of coal mines under one management.

There is immediate prospect of a statement from the Attorney General intended to illuminate the twilight zone which surrounds the activities of many trade associations. Since the efforts of the Department of Justice to be helpful under similar circumstances have not been highly successful in the past, the general feeling is that business will have to grope its way unassisted.

The courts are expected to contribute importantly to the year's developments having a bearing on the coal industry. Much interest will center around the Borderland coal case. It may be said incidentally that members of Congress who have no particular interest in the matter, one way or the other, are surprised at the importance the United Mine Workers attach to the check-off. It is evident that they are not impressed with that method of collecting dues. The thought evidently entertained is that an independent and loyal membership would be glad to remit direct. Surprise is expressed that this policy is not repudiated by the membership itself. There will be important developments in the government's effort to prove conspiracy in the Indianapolis case, which is accompanied with the highly important ramification in the District of Columbia, where the National Coal Association has invoked a salient constitutional point in the matter of haling outsiders into a distant court. While assigned cars do not come in for much discussion during depressed times, it is recognized that this controversy must be threshed out, and there will be no flagging of interest in the Lambert's Run case.

There will be much investigating done during 1922. Plans are being perfected for a comprehensive study of intermittency in the coal industry. The Chamber of Commerce of the United States is starting an investigation of a variety of coal problems. Before the year is out much will be heard of John Brophy and his committee which is preparing a report on nationalization of coal mines.

While there is no immediate prospect of national legislation which will affect the coal industry, the Frelinghuysen bill will be kept on the Senate calendar in easy reach of any Senator who wishes to call it up for discussion. Of even greater concern to the coal industry is the Kenyon bill. Those acquainted with the junior Senator from Iowa know that he does not propose legislation as an idle pastime. He had a definite purpose in mind when he introduced his coal bill. He stored up more than a smattering of coal knowledge during the Calder investigation and formed some ideas that he believes will improve the relationships between the public and the coal industry. He may be expected to use good judgment as to the most propitious time to press his bill, but there is a well defined feeling that something is going to be heard in the Senate about the Kenyon bill while the year is still young.

More study will be devoted to the general subject of the export of American coal during 1922 than has been the case in the entire history of the industry in the United States, it is believed. The reduction in freight rates and in labor costs will make it more nearly possible to compete with the English. Moreover, there is a well accentuated determination on the part of the American people to develop foreign trade. The expansion of our manufacturing capacity means the importation of greater quantities of raw materials, and coal is the ideal return cargo. Definite plans are being discussed and it is not beyond the range of possibility that the long delayed merger under the Webb-Pomerene Act will become a reality during 1922.

Trouble in Indiana Mines All Year

Indiana is the one union bituminous area that was "raising trouble" steadily during the past year without any apparent cause for its special recalcitrance. Early in the year the mine workers struck because a train was not supplied to take them home after they had quit in deference to a fatality at one of the mines, to recover for coal lost in a premature rock fall and to discipline a company one of whose motormen refused to furnish immediate transportation on the motor trip to a man alleged to be sick. These troubles were all in Vigo County, but the mine workers for one cause and another continued in a state of unrest the year long, some one part or other of the state having a strike at all times.

The powder dispute occasioned much trouble in the early part of the year, but the most vigorous protest of all arose when foreigners were brought into Gibson and Pike counties, in the southern part of the state. Eight hundred mine worker vigilantes, some armed, expelled 150 or more aliens working at the Francisco mine on June 11 and 12. The superintendent of the Ayrshire District Collieries Co. was compelled to leave and told never to return. A hundred foreigners building track for the George A. Enos Coal Co.'s strip mines were compelled to vacate the state.

After remaining idle from June 2 until July 14 work was resumed at the Francisco mine and the Ayrshire superintendent returned. The grand jury made 119 indictments of rioters and in October one Serbian miner who had been forced to leave the state brought action for $50,000 damages.

Then the disorder apparently shifted northward to Sullivan County, the commissioners of that county being obliged to swear in forty deputies to keep the peace, one of the grievances being that the extra work at one of the mines was not equally shared. These difficulties were finally handed over to John Hessler and P. H. Penna, who were appointed a committee to make a "full and final settlement."

Then followed more trouble in the south. Marchers on Oct. 20 closed Oak Knob and Fox Hill mines at Lincoln City, Ind. These were co-operative mines, and the sentiment in Illinois and Indiana does not favor any such combinations, for they, under guise of paying the full scale, reduce the wage by making assessments for the losses incurred in operation.

How Freight Rates on Bituminous Coal Play Their Part in the Nation's Fuel Distribution

Other Factors Contribute, but Rate Level May Be Biggest Influence in Future Coal Sales—Inequalities in Rate Structure Handicap Crescent Groups on Westbound Shipments—Will 1922 See Change for the Better?

By Wayne P. Ellis[*]

At no period during the past twenty years has the matter of freight rates and their effect upon the movement of traffic been so much discussed as now. Particularly is this true of bituminous coal, which enters to such a large extent into the cost of manufactured goods. Bituminous freight rates still retain the heavy increases made during the past few years. Lack of definite advice as to the future position which the carriers will or can assume is prohibiting the inauguration of a policy on the part of the shipper and consumer and is having a restrictive effect upon the movement of coal.

The rate level as a factor in competition between coal operators for particular business has no serious effect upon the movement of coal, provided reasonable differentials or other rate differences of long standing have not been changed. But it has a marked effect upon the movement of the vast quantity of coal bought by industrial consumers because they must be able to absorb freight rates in the price of their finished product.

Freight Rates in Forefront

In both of these cases freight rates will play a leading part in the sale and distribution of bituminous coal during the coming year, but this part will not be determined alone by the rate level. There are other contributing factors which have gradually imbedded themselves in the industry, principally during the past few years.

Chief among these factors is a proper fixing of coal-production cost. With respect to this the producer has received a beneficial education during the past few years. Previously this cost was a matter of small concern to the average operator so long as he was making more than his expense outlay. He has learned that present receipts must not only pay present expense but must assist in wiping out his capital investment when the product which he is selling becomes exhausted, and at the same time give him a profit. The result will be a higher average price at the mine than obtained prior to 1914, even with mine cost the same. The producer is rightfully entitled to this price and he will no doubt insist upon getting it.

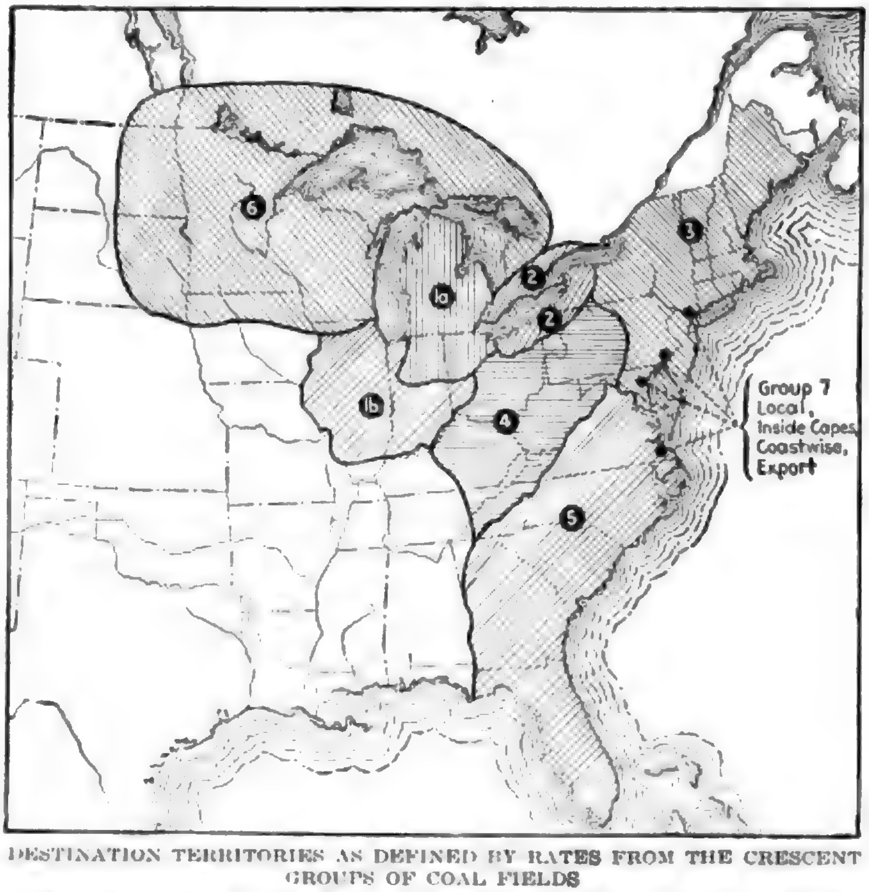
Second is the education which the consumer has received in the matter of coal quality and the kind of coal that is best adapted for his particular requirements. Better preparation of coal at the mine is resulting from this education and more scientific salesmanship will be required to sell this coal. Both elements add to the mine cost but will give the consumer more value for his money than he received in days past, when anything that was black could be sold as coal.

Right there the freight bill enters into the question because the user will require smaller tonnage of this better prepared and adapted product. The effect of this sort of thing is obvious already. A large mine operation of a prominent company today produces 10 per cent to 15 per cent less tonnage on full time with the same number of men and the same equipment than was produced during the period when demand exceeded supply. The result is a bigger slate pile at the mine and less tonnage and more heat units transported and sold to the consumer.

Third, we may hope during the coming year to see mine costs and freight rates lowered.

With these radical changes from the order of the past four years the mine operator will perhaps have to shrink his margin of profit below the point of safety in order to continue business and retain his customers. Severe competition will result and close margins of profit will obtain. As one experienced operator in the business expresses it: "We are moving from the regal days of 50c. a ton and up as profit to a nickel-nursing period during which the selling of coal will remind you of the grab-bag rush at the annual church frolic." The freight rate becomes of prime importance in this "frolic." Its influence may make the precise difference betwen getting and losing the business.

The fields in the Appalachian group located in the States of Pennsylvania, Maryland, West Virginia, eastern Ken-



DESTINATION TERRITORIES AS DEFINED BY RATES FROM THE CRESCENT GROUPS OF COAL FIELDS

The rate structure on coal from the Appalachian coal fields both east and west divides the market territory in the division outlined in this map and described in this article. Divisions 1a and 1b are the most hotly contested by competitive coals from Ohio in the east and the Illinois, Indiana and Western Kentucky fields in the west.

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TABLE I—AVERAGE RATE IN EFFECT AT PERIOD SHOWN FROM ORIGIN TERRITORY TO AFFECTED TERRITORY DESTINATIONS.

(In Cents per Net Ton)

Origin Groups	Rates in Effect During 1900	Rates in Effect on Aug. 29, 1917	I. & S. 774 Rates 1917	Ex Parte 57 Rates Effective Aug. 30, 1917	G. O. 28 Rates Effective June 25, 1918	Ex Parte 74 Rates Effective Aug. 26, 1920	Per Cent Increase Since 1900 or 1917
Inner Crescent	171	170	183	198	237	332	95
Outer Crescent	190	189	202	217	256	351	85

tucky, Virginia and Tennessee, which have been aptly termed the "Inner and Outer Crescents," will enter into this new order of things to a greater degree than other territories because of the large consuming markets they supply, the varied classes and grades of coal they produce and the favorable mining conditions prevailing within them.

In considering the effect of freight rates upon the distribution of coal from this region it is best to divide the consuming territory supplied into seven general groups, as follows:

1. General Western Commercial Region:
   (a) Affected territory, comprising northwestern Ohio, northern Indiana (except the western edge) and Southern Peninsula of Michigan.
   (b) Non-affected territory, comprising southwestern Ohio, southern Indiana (including western edge) and Illinois.
2. Lake and Canadian frontier region, comprising northeastern Ohio, northwestern Pennsylvania and western New York, west of the Genesee River (Rochester, N. Y., marking the eastern limit) and Canadian points taking delivery through the gateways thus included.
3. General Eastern Commercial region, comprising all territory east of a line drawn south from Lake Ontario through East Rochester, N. Y.; Williamsport and Harrisburg, Pa.; Hagerstown, Md.; Martinsburg, W. Va.; Winchester, Va., and Alexandria, Va.
4. Local Eastern region, comprising central Pennsylvania west of Harrisburg, southwestern Pennsylvania, southeastern Ohio, West Virginia, eastern Kentucky and western Maryland.
5. Southeastern Commercial region, comprising Virginia, North and South Carolina, Georgia and Florida.
6. Lake Cargo Coal region.
7. Tidewater Coal region.

The selection of these groups is prompted for the most part by the different freight rate basis which applies to each. It can therefore be more readily discussed from the standpoint of the effect of the rate upon the movement of traffic. It must be understood that the groups are general in outline and that the rates now in effect from the several crescent districts overlap in many instances, the details of which will not be here described. In what follows, each of these groups as outlined will be taken up in the order shown.

1. *General Western Commercial Region: (a) Affected Territory* — To this territory the freight rates from the Inner Crescent or high-volatile fields of Pittsburgh, Connellsville, Fairmont, Kanawha, Kenova-Thacker, eastern Kentucky and Tennessee are the same. This has been the rule for a long period of years, the grouped origin territory being gradually molded into its present form as time and circumstances required. The Connellsville region has been the latest addition under order of the Interstate Commerce Commission, this having been brought about by changed conditions which are forcing operators in that section to ship their coal from the mine instead of first putting it through the beehive oven process and shipping it as coke. The Outer Crescent or low-volatile fields of Altoona on the Pennsylvania R.R., Meyersdale, Georges Creek, Upper Potomac, New River, Pocahontas, Tug River and Clinch Valley take a rate higher by 20c. per net ton than the Inner Crescent fields to practically all of this territory.

The level of rates to this territory from the Crescent groups is indicated in Table I.

These rates are not weighted averages in accordance with volume of tonnage but are straight averages of rates to selected representative points. The I. & S. 774 rates as here shown were never published as such but were consolidated with the Ex Parte 57 increases and the resulting rates made effective on Aug. 30, 1917.

It will be noted that from 1900 to Aug. 29, 1917, there was practically no change in the level of the rate. Minor local adjustments were made at destinations and the same rates given to new mines and new territory in the Inner and Outer Crescents as it was developed, but the general range remained the same.

During this period the volume of coal moving to this territory increased enormously and it cannot be said that freight rates retarded the movement, nor were they the leading factor in accelerating it in any particular district. The rapid growth of the byproduct coke industry, the gradual substitution of artificial gas for natural gas and increased demand in other lines of manufacture for high grade low-sulphur and low-ash coal are the principal causes for the increases in tonnage westbound from the Crescent groups. Coal of this character cannot be supplied from any of the fields nearer to the points of consumption in this territory.

It will be noted that increases in rates from this territory have all occurred since August, 1917, and have amounted, on the average from all groups, to about 90 per cent. It can be safely stated that from 1917 to the present time we have had no normal competitive period where the effect of the freight rate upon the movement of coal could be tested. The war years of 1917 and 1918 will certainly be accepted as non-competitive in the coal business; 1919 was a year of large stock piles following the war and of a coal strike period. The first half of 1920 was a car-shortage period, not caused by an increased demand for coal but by the displacement of cars as a result of the coal strike in November and December, 1919, and of the railroad switchmen's and yardmen's sporadic "vacations" in April, May and June of 1920. The last half of 1920 was a period of heavy demand caused by a spurt in industrial activity and larger shipments of export coal through the Atlantic ports.

The year 1921 brought and kept with us the great depression in business. During the first few months of the year coal from the Crescent groups continued to move in steadily decreasing quantities under contracts with old-established trade connections. Few contracts were renewed at their expiration and what little coal was required by the consumer was purchased on the open market.

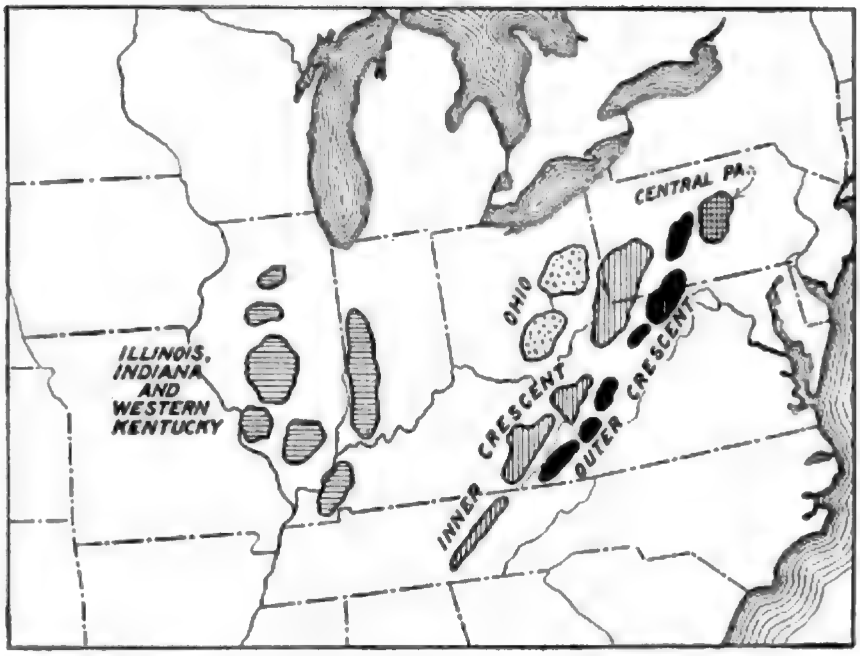
The spot price during the greater part of 1921 was dictated by the non-union fields, where reduced mine costs resulted from decreased miners' wages. Some union field operators have sold their coal at a book loss rather than shut down their properties and disrupt their organizations, but it can safely be said that the freight rate has not entered seriously into the sale of coal during this period, except to the extent that long-established differential groups continued to have the advantage of shorter distance to destination and a lower rate.

Abnormal movements of coal have occurred as a result of the condition described. The lower mine cost and consequent f.o.b. mine price from the non-union mines have enabled them to more than offset in the delivered price any freight-rate disadvantage which might handicap them under normal conditions. Eastern Kentucky and southern West Virginia non-union coal has continued to move in volume to territory normally supplied in the West and South and to new territory as far east as Buffalo and west to points in Iowa and Missouri. Mines in Somerset County, Pennsylvania, on the B. & O. R.R. since the reduction in wages took effect have operated, on the average, over 70 per cent of full time while union fields supplying the same consuming territory are practically closed down.

TABLE II.—AVERAGE RATE IN EFFECT AT PERIOD SHOWN FROM ORIGIN TERRITORY TO NON-AFFECTED TERRITORY DESTINATIONS

(In Cents per Net Ton)

Origin Group	In Effect During 1900	In Effect Aug. 29 1917	Ex Parte 57 Rates Effective Aug. 30, 1917	G.O. 28 Rates Effective June 25, 1918	Ex Parte 74 Rates Effective Aug. 26, 1920	Per Cent Increase 1920 over 1900 and 1917
Inner Crescent	188	188	203	241	338	80
Outer Crescent	202	202	217	255	352	74



COMPETITIVE COAL FIELDS TRIBUTARY TO THE INLAND WESTERN MARKET
This map shows the relative positions of the coal-producing fields described in this article to the several competitive market territories illustrated on the preceding map.

The freight rate, if continued at its present level, will encourage the short-hauling of coal, when the foregoing mining conditions adjust themselves, because of the large proportion it represents in the delivered price. Particularly will this be true on competitive coal sought to be moved to the same destination from different origin points or from groups having no direct freight-rate relationship. This can be illustrated by using Indiana and Illinois destinations.

The freight rates from the Crescent groups and from Illinois and Indiana fields have never been related by a fixed differential. The amount of the rate has been increased to a much greater extent from the Crescent groups than from Illinois and Indiana because of the large percentage advances in rates which have been made during the past three years and which applied in the case of the latter fields to a smaller base rate.

A good example of this was covered in an article appearing in the April 28, 1921, issue of Coal Age, page 763, wherein the subject of Lake cargo coal rates was discussed, and a comparison with the southern Illinois rates to the Twin Cities, Minnesota, was made at page 766. The southern Illinois rates from 1917 to date increased by $1.55 per ton, or from $2.30 to $3.85, while the total transportation cost of Pittsburgh district coal via Lake increased by $2.74½, or from $2.74 to $5.48½.

Methods of Reducing Coal Rates

This condition leads to the idea that, if general reductions in coal rates should be thought proper, they should be made by the same methods applied to the several general advances which have taken place in the past four years. This would restore, as far as may be possible, the freight rate differences at destination between the several competitive groups under which the business was developed and under which it thrived during normal periods prior to the war.

The same general remarks apply with equal force to the movement of coal from the Crescent groups to each of the destination territories heretofore outlined and in the following paragraphs under each of the destination headings only those conditions which peculiarly apply to that movement are discussed.

(*b*) *Non-Affected Territory* — The level of rates to this territory from the Crescent groups is indicated in Table II.

It will be noted here also that there was no change in the level of the rates from 1900 to Aug. 29, 1917. Since that date the advances made have approximated 77 per cent.

Comparing the rates from these origin groups to the Affected and Non-affected territory as shown in the foregoing tables, it will be noticed that the amount of the rate since Aug. 30, 1917, has been approximately the same from the Inner Crescent group and almost exactly the same from the Outer Crescent. No inference of consequence can be drawn from such a condition, as the result is perhaps more of a coincidence than a premeditated grouping.

No particular comment is required concerning this territory. The same general remarks made in connection with Affected territory apply.

2. *Lake and Canadian Frontier Region.*—Unfortunately there is not readily available information as to the level of rates to all of this territory for a period of years. It embraces one of the most dense coal-consuming centers in the country and enjoys, because of its proximity to a large coal-producing territory, most favorable freight rates. The fields in the Crescent regions are not grouped for rate-making purposes but each district carries a different rate, with the Pittsburgh district having the lowest rate because of the shorter haul.

Taking Cleveland as an example of destinations included, the rates from origin districts are shown in Table III.

The Pittsburgh district is the largest supplier of coal in this territory, particularly to the Mahoning and Shenango Valley steel and allied industries. The coal from districts in southern West Virginia and eastern Kentucky which moves there in normal times is for special purposes, such as by-product coke manufacture. The movement of coal from the latter-named districts to this consuming section was comparatively heavy during the year 1921 because of lower mine cost and consequent lower price compared with the union fields of Pittsburgh and Fairmont. Freight rates were not a material factor in this movement from Kentucky, as can be seen readily from a comparison of the rates.

3. *General Eastern Commercial Region.*—This territory, embracing as it does such a large area and having in it some of the greatest manufacturing industries, is the largest bituminous coal-consuming region in the United States. The coal fields which supply it also are large in extent and for rate-making purposes are grouped into large areas. All of the mines in Pennsylvania located east of Latrobe, on the Pennsylvania R.R., and east of Indian Creek, on the B. & O. R.R., all of the mines in Maryland and in the upper Potomac district in West Virginia take the same rate of freight to specific destinations in this consuming territory. Mines in the Greensburg district located between Latrobe and Radebaugh, on the Pennsylvania R.R., take a 10c. per gross ton differential over the central Pennsylvania or base group. The Westmoreland, Connellsville, Klondike and Fairmont districts and mines in the Pittsburgh district proper located on the W. S. B. R.R. and on the P. C. & Y. and Montour R.R. when routed via the P. & L. E. and N. Y. C. or Erie R.R. take a 25c. per

TABLE III.—RATES FROM ORIGIN TERRITORY TO DESTINATIONS IN CLEVELAND DISTRICT
(In Cents per Net Ton)

Origin District	Rate in Effect 1900	Rate in Effect Aug. 29, 1917	Present Rate Effective Aug. 26, 1920
Pittsburgh	90	100	205½
Connellsville	105	115	211½
Fairmont	105	115	220½
Cumberland-Piedmont	140	135	238
Kanawha, Kenova-Thacker, Logan	130	125	266
Eastern Kentucky and Tennessee		125	266
New River	140	145	286
Pocahontas	140	145	286

TABLE IV.—LAKE CARGO RATES FROM REPRESENTATIVE CRESCENT DISTRICTS
(In Cents per Net Ton)

Period in Effect	Pittsburgh	Fairmont	Kanawha	Pocahontas
1901—1902	73	81½	82	97
1903—1907	83	91½	92	107
1907—1911	88	96½	97	112
1912—1916	78	90	97	112
4/16/17-8/12/17	93	105	112	127
8/13/17-6/24/18	93	108	118	133
6/25/18-8/25/20	130	145	155	170
8/26/20 to date	186	201	211	226

gross ton differential over the base group. Mines west of Pittsburgh on the P. C. & Y. and Montour R.R. when routed via the P. & L. E. and Western Maryland R.R. and mines on the C., C., C. & St. L. Ry. take 40c. over the base group. Mines on the P. & W. V. R.R. take 10c. over rates from W. S. B. R.R. mines.

With the exception of the lower Connellsville district on the Pennsylvania and Monongahela R.R.'s and mines in the Fairmont district on the Monongahela R.R., which were added to the Westmoreland eastbound groups in 1917, these great groups of origin have been maintained for years. During the past four years, when freight rates from this territory have been greatly increased, there has been no retarding or increase in movement which could be attributed to the measure of the rate. In 1921 the large volume of tonnage came from the non-union mines, the union mines for the most part shipping to established customers on contracts made during the previous year.

In this connection it is noticeable that in the New England states, particularly those sections bordering on the Atlantic Coast, the water-borne coal from the Pocahontas and New River non-union mines has practically eliminated the all-rail coal. There are two reasons for this: first, the low water-freight rate and second, the lower f.o.b. mine price. Pocahontas coal has been sold on cars at the New England port for but little more than the all-rail freight rate to that point from the central Pennsylvania field.

It is well to mention here that in all of the rate advances which have taken place the differentials as between the origin groups have been maintained. All of the fields shipping all-rail being related in this manner, there has been no improvement in the relative advantage of one over another to this territory. The ex-water coal obtained an advantage in that the rail factors of the transportation haul were not advanced in as great an amount as that on the all-rail coal to New England tidewater points.

4. *Local Eastern Region*.—This consuming territory obtains its supply all-rail from the nearest adjacent mines. In the Pittsburgh district proper a large tonnage is handled by water, in most cases from mines which are owned by the consumer. It is needless to say that such movements will continue, as even with the very material increase in these short-haul rates, the adjacent mines maintain their advantage over further distant operations.

5. *Southeastern Commercial Region*.—Virginia and North Carolina are supplied from the fields in southern West Virginia, Virginia, Tennessee and southeastern Kentucky. In South Carolina, Georgia and Florida competition from the Alabama mines is encountered but the relative bases of rates from each of the sections have not materially changed. The differentials as between the nearer low-volatile fields of Pocahontas and New River and the high-volatile fields further west is but 10c. per ton, which compares with 25c. and 40c. between the low- and high-volatile fields of Pennsylvania, Maryland and northern West Virginia on eastbound traffic.

This low differential prompts the conclusion that the southern West Virginia high-volatile fields have a better chance to retain their Eastern markets than their neighbors on the north by not absorbing so much in their price for coal at the mine.

6. *Lake Cargo Coal Region*.—A different situation exists with reference to the level of the Lake cargo rates from Crescent origin districts than applied to all-rail coal. Table IV shows these rates in cents per net ton from 1900 to the present time but only from representative Crescent districts from which Lake coal is shipped.

On May 4, 1921, a 28c. reduction in all Lake cargo rates became effective, but it applied only on cargo coal transshipped to the upper Lake docks on Lakes Superior and Michigan (west bank, excluding Chicago). On Aug. 1, 1921, this reduction was made applicable to all Lake cargo coal transshipped to docks located on, north and northwest of the Detroit River. These reductions and destination applications were to have expired on Oct. 31, 1921, but in the case of most of the roads carrying Lake cargo coal they were extended to Nov. 30, 1921. The movement of Lake coal from all districts responded to this reduction to such an extent that the upper docks are stocked to capacity.

Considering the general trend of Lake cargo coal movement during the period covered by the foregoing statement of rates, the tonnage from the Pittsburgh and Fairmont districts, which have a rate advantage under the balance of the groups, has been decreasing proportionately. Increasing demands in other territory has been the principal reason for this change, the Pittsburgh district supplying the bulk of the tonnage to the short-haul Pittsburgh and Valley territories and the Fairmont district operators shipping most of their coal to the East. The level of the rate has not been a deciding factor in this decrease, as these two districts, particularly Pittsburgh, have enjoyed a material rate advantage over other Crescent districts.

Lake cargo coal from the higher-rated districts of Pocahontas and New River is shipped for the most part for byproduct purposes and from mines owned or controlled by the consumer. More keen competition is being met in the Northwestern States on high-volatile coal from the Crescent groups through increased movement from the Illinois and Indiana fields. The rate advances on Lake cargo coal to Northwestern destinations and from southern Illinois fields to the same points, which were referred to earlier in this article, indicate the advantage gained from a freight-rate standpoint by operators shipping coal to the Northwest from Illinois districts.

TABLE V. TIDEWATER RATES TO BALTIMORE FROM THE INSIDE OR LOWEST-RATED GROUP TERRITORY
(In Cents per Net Ton)

Period	Baltimore Proper	Inside Capes Rate	Outside Capes Rate
1915..........	160	135	118
1917..........	175	150	123
6/25/18.......	220	195	173
8/26/20.......	318	293	253

It will be proper to refer again to the article appearing in the April 28, 1921, issue of COAL AGE, as it covers the situation more fully from a rate standpoint and the tonnage figures given there show the changes in the movement of Lake cargo coal from the various districts.

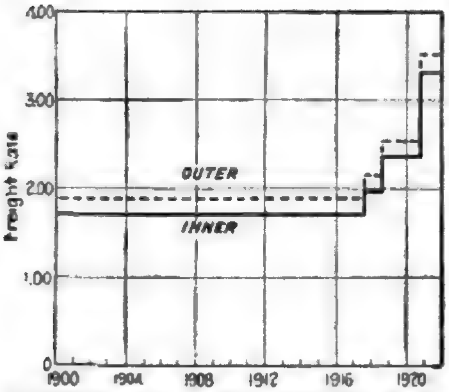
7. *Tidewater Coal Region*. — The Crescent fields supply practically all of the Tidewater coal moving through Atlantic coast ports. The same grouping of origin districts applies to this movement as that outlined under that to the general Eastern commercial region. Little export cargo coal moves through the port of New York, the bulk of it going to Hampton Roads, Baltimore and Philadelphia.

At these three ports two sets of rates are applicable on transshipped coal, one to points inside the Capes (most

TABLE VI.—ALL-RAIL AND WATER FREIGHT RATES ON CLEARFIELD COAL TO BOSTON AND PORTLAND

	To Boston, Mass.				To Portland, Maine			
From	1914	June 24, 1918	August 25, 1920	Present Rate	1914	June 24, 1918	August 25, 1920	Present Rate
Clearfield Region to Greenwich Piers*	$1.25	$1.30	$1.80	$2.60	$1.25	$1.30	$1.80	$2.60
Boat rate	0.75	2.50	2.75	1.25	0.75	2.65	2.90	1.40
Marine Insurance	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Handling charge boat to cars, including weighing	0.21	0.21	0.38	0.39	0.21	0.21	0.35	0.35
Totals	$2.26	$4.06	$4.98	$4.29	$2.26	$4.21	$5.10	$4.40
All-rail rate from Clearfield region	2.60	2.75	3.30	4.72	.....	.....	3.80	5.42

*Plus 50c. per car weighing. Marine insurance varies according to type of ship, but 5c. is about an average.



INCREASES IN BASE LEVEL OF COAL FREIGHT RATES FROM INNER AND OUTER CRESCENT GROUPS, 1900-1921. TO WESTERN COMMERCIAL MARKET REGION

of the coal moving to local points within the harbor at the port transshipped) and the other to outside Capes points. The general level of Tidewater rates and their relation to the rate to the port proper for track delivery are shown in Table V.

The outside Capes rate from Philadelphia and Hampton Roads is higher by 7c. and 27c., respectively than the same rate from Baltimore. It will be noted that the inside Capes rate at Baltimore is 25c. less than the track delivery rate and the same situation exists at Philadelphia and Hampton Roads. At New York harbor the transshipment rate is 30c. less from upper harbor piers and 35c. less from those in the lower harbor than the track delivery rates.

The same general situation prevails with reference to inside Capes and New York harbor rates as has been heretofore discussed with reference to all-rail commercial coal. On the outside Capes rate, however, a different condition obtains, first, on the movement to U. S. destinations in New England and elsewhere, and second, to export coal.

On the movement to New England, where the larger portion of outside Capes coal has gone in normal periods, the present rail rate to the port plus the port charges and present water transportation rate gives to the waterborne coal a decided advantage over the all-rail to eastern New England destinations. Table VI, showing this comparison, is self-explanatory.

In conclusion, the situation as to the movement from the Crescent groups may be summed up briefly as follows:

The westbound shipments encounter greater competition from outside coal fields with some of which there is no present differential relationship and which in most instances have lower rates to the competition destination points. To the extent that this difference remains unchanged the Crescent groups as a whole will continue to find it increasingly difficult to sell coal for general steam and domestic purposes, excluding special-purpose coal.

The eastbound movement is controlled by the Crescent groups and providing present differentials as between Crescent districts are maintained as they have been through all past general rate increases, the level of the rate should not have a material effect upon the movement of the coal from a competitive standpoint. This, of course, excepts the Tidewater coal transshipped to points outside the Capes, to which different elements apply, as previously pointed out.

What the consumers' intentions are, in case freight rates on the average continue to represent 50 per cent or more of the delivered price of coal, is the important part of the problem, which cannot be answered at the present time.

Where There Was No Work in 1921 There Could Be No Strike; Hence It Was a Year of Peace

By R. Dawson Hall

SPEAKING generally the year just past has seen few strikes in the bituminous regions. Had there been any such periods of unpleasantness in the union mines they would have passed unnoticed because those mines were idle much of the time for lack of orders. The non-union mines also were free from trouble though attempts were made in Mingo County, West Virginia, and in the Willis Run mines of the same state to terrorize the men who wanted to work and compel them to quit.

During the year Alabama operators confirmed their independence of the union, and the custom mines of Washington State became non-union, only the railroad mines continuing to run on a union basis. At the present writing in several parts of West Virginia the union is losing members, not singly but by locals. This is notably true in the New River district. Much disaffection exists in northeastern West Virginia. The mine workers want work and cannot get it at union wages, so they must leave home or induce the operator to cut the scale. As the union has declared against a wage reduction, it can be accepted by union men only at the cost of membership and by a local at the expense of its charter.

Meantime, Judge Anderson's decision that the check-off is a conspiracy in restraint of trade, though much modified by the Federal Court's decision, has caused coal men to wonder if it would be safe to make agreements of any kind with the union. Is a bargain with the union a conspiracy in restraint of trade? Perhaps not, but the bargains such as the union is willing to make with check-offs for gun purchases and violence are conspiracies not only against trade but against public order. This, with the fact that the union has maintained wages despite the loss of markets and especially of contracts to union mines, made the Ohio and the Pittsburgh operators refuse to meet with the international union and conclude an agreement in 1922. As a result the meeting was called off by President Lewis on Jan. 4.

The anthracite region, despite almost steady work, had less strikes than usual. One reason was that the completeness of unionization prevented "button strikes." Another doubtless was the fact that no one appeared who was able to tell the men about fabulous wages being paid elsewhere. Such stories as these were the cause of much trouble in the years of inflation. Wages have fallen considerably in the industries around the anthracite fields and doubtless the mine workers know it, though, undaunted, they are asking for 20-, 40- and 60-per cent wage increases for next April. Even the Pennsylvania Coal Co. found 1921 better than 1920, though there was almost continued trouble at its mines.

From Sept. 20 till Oct. 5 the United Mine Workers of America held its biennial meeting and in the course of the prolonged session, at the advice of President John L. Lewis, it decided not to prepare its demands for the scale to come into effect April 1, 1922. It did well. Much water has flowed under the bridge since that time.

The union, in the bituminous regions at least, now knows that wages must come down, not go up. Many of the union men of that date are working at a lower wage and are determined to make it even lower if work cannot be obtained otherwise. The scale committee is to bring in a report before Feb. 14.

At the biennial convention the secretary-treasurer's report showed that the union had 515,243 members out of the 750,000 mine employees. Thus about 69 per cent of the employees are unionized. The union would have had $486,820, or $0.94 per mine worker, had all debts been paid. It had in cash about $1,000,000. Herbert Hoover, Secretary of Commerce, suggested that the wage scale be reduced, but the proposition was quietly ignored. He also tried to get the union men to pledge themselves to arbitrate their issues with the operators this spring, but John L. Lewis declared it could not be arranged until after the report of the scale committee had been received, some time early in February. Soon after the biennial convention Mr. Lewis tried to induce the President

TABLE I—WAGE RATES IN EFFECT JAN. 1, 1922, IN COMPETITIVE FIELDS SHIPPING TO EASTERN MARKETS.

	Central —Pennsylvania—		Connellsville	Tug River, Winding Gulf & Pocahontas	New River 1917 Scale	Somerset County				Westmoreland County		Upper Potomac Non-Union
						Meyersdale		Northern				
	Union	Non-Union				Low	High	Low	High	Low	High	
Pick Mining, net ton	1.1431	0.9031	0.626	0.50 wide 0.55 narrow	0.5911	0.67	0.9031	0.75	0.98	0.55	0.75	0.67
Machine Loading, net ton	0.7729	0.625	0.395	0.35 wide 0.40 narrow	0.4732	.....	......	0.535	0.66	0.397	0.64	0.455
Cutting and Scraping, net ton	0.1600	0.127	0.10	0.08 wide 0.10 narrow	0.1071	.....	......	0.11	0.165	0.116	0.14	0.08
Skilled inside labor, hour	0.9375	0.625	0.625	0.47	0.585	0.60	0.67	0.58	0.625	0.50	0.6625	0.49
Other inside labor, hour	0.909	0.60	0.518	0.40	0.52	0.30	0.64	0.50	0.60	0.40	0.58	0.45
Dumpers, weighmen, trimmers, hour	0.8875	0.49	0.333	0.40	0.52	0.50	0.64	0.47	0.49	0.35	0.5437	0.43
Other outside labor, hour	0.825	0.45	0.222	0.30	0.50	0.50	0.64	0.31	0.45	0.30	0.50	0.40

to extend government credit to idle workingmen, but without avail.

Throughout the year the various non-union fields steadily cut wages until now the rate on pick mining is in some of them 56 per cent lower than in the central Pennsylvania field, with which they come in competition. Table I shows this difference between non-union and union wages quite plainly. It does not, however, afford a clear idea of the difference between mining where every detail of operation is regulated by rules made at the demand of the union and mining in a non-union field without such restrictions.

Year of Sporadic Strikes Troubled Anthracite Region

If any one common cause will connect the anthracite strikes together during 1921 as beads are strung on a cord it will be found that the cord is union politics. Where union politics are absent the anthracite region has gone on producing without hindrance. In the north there is a perpetual fight for supremacy between the regular and insurgent factions, and trouble is bound to occur.

Jurisdictional strikes divide the building trades, but it is political strife that divides the mine workers' union. Perhaps the absence of jurisdictional strikes to bind each union into a compact whole is the cause for the dissensions within the United Mine Workers of America which tend to split it but never succeed. It is difficult to get anywhere, however, with a team that is continually fighting. So, at least, the anthracite operators have found it.

The Pennsylvania Coal Co. and the Hillside Coal & Iron Co., both Erie R.R. affiliations, commenced the year with two main difficulties, the demand of $10,000,000 back pay on the part of the men (arising out of the practice of requiring 2,700 lb. of coal per ton in order that the company might realize therefrom a ton of salable coal) and the desire of the men to drive out of the industry the "hustlers" who had been employed by the subcontractors when the work of mining had been farmed out instead of being handled directly by the company itself.

The difference of opinion as to the unit of weight, however, did not result in a strike, as the men were too anxious to earn a living and straighten up the debts contracted during the strike of the previous year. Two dates were set for a strike, Jan. 2 and Jan. 15, but in neither case did the men actually suspend work. Struggles arose about a union charter and about local wage rates. Rinaldo Capallini favored a strike; James A. Joyce opposed it. A strike was called at one mine, but the men failed to go out.

Joyce's store and residence were dynamited in revenge for his desertion of the malcontents. Men deserted the insurgents for the United Mine Workers of America, realizing that it was no time for a strike. For a while nearly everyone wanted peace, and Capallini's influence was unable to change the almost universal decision. He wanted a strike also to compel the discharge of the hustlers, but when these men joined the union, all Capallini could say or do could not prevent the settling of this controversy. A lull in business coming shortly after made the Pennsylvania employees more disposed than ever to continue at work.

At about the same period of time the anthracite mine workers were still trying to obtain a wage increase based on the request of President Woodrow Wilson (after a conference held between the Secretary of Labor and mine workers' leaders, Oct. 6, 1920) that the wage committee be reconvened for the "adjustment of inequalities" in the wage contract. The miners' leaders for a long time hoped that they could obtain a new scale or at least the eight-hour day for tenders of machinery and other easy-going workers, but the operators stood by the contract and while willing to discuss inequalities would not permit a meeting for the discussion of the relative wages in the anthracite and bituminous regions.

A time of peace intervened, the outcome of somewhat slower work in the anthracite region. The mine of the Jermyn Coal Co. shut down, asking a reduction of wages. The Suffolk Coal Co., another independent, closed down. The men became worried lest there be no work and so lost all desire to strike. It was not until June 20 that the turbulent workers of the Pennsylvania Coal Co., finding work steady, decided to strike. The suspension lasted only a week, however. Nominally a demand for the equalization of pay between collieries, it was really an outcome of party politics, a quarrel between the locals and the district union.

Early in August strikes began to trouble the Lehigh Valley Coal Co. Eight collieries were idle, but on Aug. 10 they went back to work. This fight really was one between the grievance committee and the district union. The miners were working steadily and strikes accordingly became frequent, involving the Hudson Coal Co., the Pennsylvania Coal Co., the Glen Alden Coal Co., the Hillside Coal & Iron Co. and the Temple Coal Co. These strikes were short, however. They evidenced chiefly the unhealthful influences of steady work and union politics.

The Pennsylvania Coal Co. had a strike of 8,000 men on Nov. 14, and the Lehigh Valley Coal Co. on Dec. 13 had one involving eight collieries. This latter strike was brought in order to force the hand of the district union. The men were insistent on a new scale: $8 per day for such miners and $7 for such laborers as were working in abnormal places, lower prices for coal delivered to miners and more pay for mining coal. The Lehigh strike had not ended when the year closed, but bad times had fallen on the anthracite industry, and it seems likely that there will be peace now for some months, as work is scarce and money must be laid by for the test of strength April 1 of this year.

It will be noted that all the strikes mentioned are in the Northern field. The Middle and Southern fields seemed to enjoy almost undisturbed peace throughout the year.

Washington Custom Mines Cut Wage and Leave Union

Nearly all the western Washington coal mines closed down March 16, when, in accordance with their circular of Feb. 28, the operators endeavored to put in force a wage reduction of approximately 23 per cent, which would restore the scale of Oct. 31, 1919. The Northwestern Improvement Co., operating ten railroad mines in the Roslyn Cle Elum field, was not affected nor were the commercial mines located in the vicinity. No reduction in wage was attempted in that district.

On April 26, at the behest of Ed Clifford, director of the State Department of Labor and Industries, a meeting was arranged between the operators and mine workers. Finally on May 21 an agreement was reached to submit the matter to a commission consisting of J. H. Allport, of Barnesboro, Pa., independent arbitrator; Robert Harlin and Ernest Newsham, representing the mine workers, and N. D. Moore and D. F. Buckingham, the operators.

The commission recommended a reduction in wage. Its scale was accepted by the operators, but the mine workers did nothing further for five weeks and at the end of that time refused to accept the reduction. In consequence the Washington commercial-coal operators determined to run open shop, paying underground daymen $6 per day; underground common labor, $5.25; surface daymen, $6, and common labor on the surface, $4.50. On Aug. 22 the mines were reopened under the conditions outlined, and work has been proceeding satisfactorily since that time.

Colorado Coking-Coal Men, Long Idle, Accept Wage Cut

It will be remembered that the Colorado industrial law prohibits strikes, lockouts and wage reductions until a month's warning has been given and provides an industrial commission to hear both sides to a controversy and to decide which party is right as to the points of issue. In April of last year Justice Dennison decided that the law was constitutional, working no industrial servitude, and that it applied to coal mining. In 1921, owing to the condition of the market, especially for coking coal, the law as it related to coal mines came into prominence by reason of an attempt of the operators, led by the Colorado Fuel & Iron Co., to reduce wages in those mines where the workmen favored such a reduction as preferable to idleness.

It will be recalled that under the Rockefeller plan of industrial representation the Colorado Fuel & Iron Co. held frequent councils of its workmen and officials to decide on operating conditions. On Aug. 1 the company notified the commission that it intended to reduce wages. It did not act, however, without taking a ballot of the men in order to ascertain how they would regard such a reduction. The ballot showed several mines in favor of the cut, believing that lower wages were preferable to idleness. At these mines the wage was reduced Sept. 1. It may be noted that the aim was to make a wage cut to offset that in the Connellsville field, that cut having put the Colorado Fuel & Iron Co. out of the steel trade.

The union, being here, as elsewhere, opposed to a reduction, called out the men and 12,000 responded. The State Industrial Commission immediately held hearings and prohibited the company, Sept. 10, from action till thirty days had expired, re-establishing the wage scale. The wage which the company sought to establish was that in force Nov. 30, 1919. The union asserted that by asking them to accept a reduction the company violated its promise to its men to the effect that the wage changes in its mines would always reflect those in the country as a whole.

As soon as the strike commenced Governor Shoup ordered a number of State Rangers to patrol the region. Later the Victor-American Fuel Co. and two operations at Colorado Springs, the Keystone Mining Co. and the Pikes Peak Consolidated Fuel Co., declared their intention to seek a reduction. The steel workers of the Colorado Fuel & Iron Co., idle by reason of the high price of coke and having agreed to wage reductions, asked the coal miners to accept a cut, which would enable both steel and mine workers to return to work.

The commission did not suspend its order of Sept. 10 till Nov. 5, thus far exceeding the time within which it should have completed its investigation. It found that the company had submitted the matter to a fair vote and that there could be no exception taken to a wage reduction in the several mines that had favored it.

It did not enter into the question as to the fairness of the wage set. The members of the court said that the men who wanted to strike were at liberty to do so, and the union immediately called a strike. The company put the new scale in operation at thirteen of its mines on Nov. 16, and, as violence immediately broke out which the sheriff declared himself unable to quell, the militia was ordered out.

Many of the Colorado Fuel & Iron Co.'s men continued at work, but dynamite outrages occurred at the Oakdale Coal Co.'s mines, probably out of the general spirit of lawlessness that the strike engendered. Order was eventually restored but on Dec. 2 five large companies of Huerfano County filed with the Industrial Commission reductions in wages of 32½ per cent to take effect Jan. 1, urging that the cut at the mines of the Colorado Fuel & Iron Co. made that action necessary.

Howat and Industrial Court Law Keep Kansas at Fever Heat

So long as Alexander Howat, president of the Kansas branch of the union, was in prison, Kansas was quiet. When he left jail his first act was to order a strike at two mines about a boy named Karl Mishmash, who by agreement between the joint board of miners and operators was to have a certain wage on arriving at the age of nineteen.

This was a small matter, but in calling the strike the Industrial Court was flouted, and the presiding judge ordered Howat's arrest, which took place Feb. 7. On Feb. 16 he was found guilty of contempt of court and sentenced to a year in jail, as was also August Dorchy, the vice-president, and the executive board members. An appeal with payment of bail restored Howat to liberty. Thomas Harvey, secretary-treasurer of the United Mine Workers in the Kansas district, broke with Howat on this occasion. On Feb. 20 the Industrial Relations Court ordered that Mishmash be paid $187 in back pay, and the strike ended.

On April 8 Howat was ordered to pay a fine of $200 for having called a strike of mine workers two weeks previously and to give bond in $5,000 that he would not again disobey the court by calling a strike. Given a jury trial on July 8 and found guilty, Howat and Dorchy were sentenced to six months in jail and a fine of $500, the jury declaring that if it had not been for the instructions of the court they would not have found them guilty of "any wrong."

A strike of the Dean Milling Co. and the Reliance Coal Co., both of which companies operate mines, again called Howat and Dorchy under the censure of the court and the International Board of the United Mine Workers tried to have Howat end the strike. He was called to Indianapolis Aug. 16 and ordered Aug. 22 to return to Kansas and call the strike off. This he would not do. Howat was under sentence to go to jail Sept. 8 and he declared in a statement issued Aug. 25 that he would go rather than obey the court and give bond thereto. He and Dorchy rather than give bail in $2,000 went to jail Sept. 30.

On Oct. 1 the biennial convention of the union met in Indianapolis. After a big contest of wits the convention ordered Howat to obey the international board and tell the Dean and Reliance men to go back to work. Howat, however, succeeded in being elected as one delegate of two to represent the American mine workers at the International Mining Congress that meets this year in England.

As the strike continued and became general throughout the state, John L. Lewis, president of the mine workers' union, on Oct. 13 suspended Howat and replaced him by George L. Peck, a member of Kansas executive board, whom Howat had suspended. Thomas Harvey, always ready to obey the union officials at Indianapolis, continued as secretary-treasurer. John Fleming was appointed interim president by Howat, and on Oct. 15 he announced the formation of an insurgent union. The Kansas Federation of Labor through W. E. Freeman on Oct. 14 came out in support of Howat. The Indianapolis group, while opposed to the industrial court law and ready to fight it legally, tried in every way to cause the men to return to work. Fifteen hundred did so on Oct. 17.

The Illinois branch of the union under Frank Farrington, always openly insurgent, refused to leave in union hands the balance of the $100,000 lent to the Kansas mine workers to fight the industrial court law and demanded the $43,000 still remaining, much of the $57,000 having been spent opposing Governor Allen's re-election. This was followed on Nov. 11 by a vote to assess $1 per month per man on all the mine workers in the Illinois district union, the purpose being to raise $90,000 a month to help the striking Kansas miners.

On Nov. 17 the International Board expelled Howat from the union and appointed Van A. Bittner as special representative in the Kansas fields. By Nov. 28 half the Kansas mine workers were said to have returned to work, 1,500 disgusted men had left the state and 2,500 had been expelled from the union. The men by returning to work angered the women, and on Dec. 12 they proceeded to march and ride in automobiles from mine to mine threatening and using violence on the men who were at work and compelling other women to join them. Their husbands and brothers followed behind, loudly declaring that they would lay violent hands on all who would oppose the women. Most of the men in the mines and strip pits laid down their tools. The Governor called on the Kansas National Guard and order was restored, work being resumed immediately thereafter at all the mines.

Early in November the International Board of the United Mine Workers engaged a former Iowa State Senator, John T. Clarkson, to test the constitutionality of the industrial court law. The Supreme Court has set Feb. 27 for the hearing of the argument in this case.

Amid Tumult Mingo County Mines Work Steadily

Early in the year the coal mines of Mingo County, West Virginia, were being operated by non-union men, peace being maintained more or less successfully by the military forces. The strike, which had commenced in May of the previous year, was still being supported by the union, which to date has never wavered in its determination to pour in money till it wins its contest. On April 5, after the withdrawal of the military forces and at the conclusion of the Matewan trial, violence broke out, a fusillade being opened on Merrimac. On May 12 and a few following days drumfire became quite generally prevalent in the Mingo region.

In July Keeney addressed a proposal to Governor Morgan in which he sought to have the strike ended by requiring the operators to accede to the re-employment of all strikers without discrimination, an eight-hour day, semi-monthly pay, check weighmen, payment by the ton, a wage adjusted by a board of five representing operators and men, with a board of three to decide should a settlement not be reached, the board to have a representative of the operators, one of the men, and a third, a non-resident of the state, selected by the other two. The offer was not accepted.

Toward the end of July the Senate sub-committee of the Committee on Education and Labor held hearings regarding the strike. Other hearings were held after the Marmet insurrection toward the end of October. David Robb, international financial agent for the United Mine Workers in the Mingo district, was ordered by the authorities to leave the state. Two international organizers also were told to leave, but none of the three left, and on July 8 they were arrested with nine others for having unlawfully assembled in contravention of the orders issued under martial law.

On Aug. 20 miners began to assemble at Marmet to march on Mingo County and drive out the men who were mining coal. By Aug. 25 there were from 4,000 to 6,000 armed men assembled, and the march was started. The immediate goal was Williamson, which lies 80 miles by the road from Marmet. The men passed through Boone County and were halted only when Logan County was reached. The federal government, when appealed to, waited to investigate, and Brigadier General Bandholz, who was sent to look the ground over, called into conference C. F. Keeney and Fred Mooney, president and vice-president, respectively, of the district, and told them that they would be held responsible for the march if martial law was declared. They then induced many of the marchers to return home. On Aug. 30 President Harding issued a proclamation ordering the marchers to disperse. The fighting became more severe than ever, but at midnight of Sept. 1 General Bandholz sent for troops, and on their arrival the men surrendered and were sent back to their homes.

A Logan County jury indicted 1,217 men, charging them with murder, and Keeney and Mooney were arrested Sept. 18 at Charleston. Boone County juries on Oct. 1 indicted 300 men.

On Sept. 23 the Borderland Coal Co., a Mingo County corporation, applied to Judge Anderson for an injunction preventing the Central Competitive operators from collecting the "check-off," declaring it was used to support the union in its attacks on the operators in the Mingo field. Judge Anderson granted the injunction requested on Oct. 31. On Nov. 4 the federal Court of Appeals, at Chicago, suspended the decision, and on Dec. 15 that court sent the injunction back to Judge Anderson to be recast because it did not confine the grant of relief to the Borderland Coal Co., did not enjoin solely the interfering acts shown in the bill and affidavits, did not limit the prohibition of sending money into West Virginia to the use thereof in interfering acts and because it enjoined existing check-off contracts.

During Past Year Connellsville Cut Wages Drastically

As early as March 8 wage reductions were made in the Connellsville region, W. J. Rainey Co. making a general cut of 18 per cent applicable to all classes of labor, thus breaking away from the tradition in the Connellsville region that the H. C. Frick Coke Co., the leading operator, shall lead in wage revisions. The cut affected the wages of 2,500 men at ten plants.

The next move was made by the other independents of the union, who on April 1 restored the Nov. 10, 1917, scale, thus giving a cut of 22 to 30 per cent on all grades of mine and oven labor. The W. J. Rainey Co. at the same time brought its wage down to accord with that of the other independents. The steady work resulting from these reductions brought many men to the Connellsville region from Scotts Run, Monongalia County, West Virginia, and other sections.

Early in May the United States Steel Corporation began to cut wages of all employees, and the H. C. Frick Coke Co., a subsidiary, on May 12 announced a cut of about 30 per cent to take effect May 16. About 25,000 men suffered from the cut. On July 1 the independent operators put another scale in operation which was 10 per cent lower than that which they were paying and 33⅓ per cent below that paid when the year opened. This also was accepted.

The Connellsville region had not had a strike since 1902 and did not break its record until, on Aug. 19, when the wage was reduced for the third time, the new scale allowing skilled miners slightly above $3 a day. The Allison plant struck first, and many others followed. Disorder broke out, the Rainey men marching from mine to mine and closing them down, yet without violence. The strike spread rapidly and in the upshot the independent companies granted the Frick scale, and since that time the wage has not been changed, and there have been no strikes or disorder.

Alabama Confirms Its Status As an Open Shop

When 1921 opened Alabama, according to reports of the operators and the tonnage reports, was working steadily but still had a general strike, according to the union reports. The mines had been filled up with non-union men and with seceders from the union. All that was lacking was recognition by the union of the facts as they were. On Feb. 22 an order of the United Mine Workers declared that the strike was at an end. This closed six months of disorder. The national guardsmen were immediately withdrawn.

However, Governor Thomas E. Kilby's decision as arbitrator had not been given. When he rendered it under the advice of his committee of three, March 19, it was unsparingly condemned by Van A. Bittner, acting for the striking mine workers and the union. The Governor declared that the method of adjusting grievances was fair and equitable and that the operators were justified in not taking back the strikers, but should do so as vacancies occurred. He called on the unions to continue to feed the men till they could find work.

Defending voluntary unionization he condemned the compulsory unionization methods of the strikers. He also refused to concede to the day workers a flat raise in wage equal to that given in the unionized fields. The men had received a percentage raise equal to that awarded elsewhere but had demanded the same increase in dollars as had been granted in fully unionized fields.

The 26,000 men thus left idle and deserted immediately after the award by the union were for some time in the greatest of destitution. They sought help of the state, and later the union appealed to Secretary of Labor Davis to interfere and modify the arbitrator's decision. Idleness of the men working in the mines followed soon after and early in June most of the commercial mines and some of the furnace companies had reduced wages 18 to 20 per cent in order to meet outside competition in the coal and steel trades.

Rail-and-Water Versus All-Rail to New England

Water Route Returning to Favor with Failure to Adjust Rail Freight Rates — Shipments from Central Pennsylvania Suffer Severely — Need Felt for Intelligent Revision — Canadian Points Also Affected

By G. G. Wolkins
Boston, Mass.

WATER-BORNE COAL is again strongly in favor with large areas in New England, thereby reversing traffic conditions that prevailed from 1915 until the spring of 1921. Receipts of coal transshipped at Newport News and Norfolk are counted upon to increase in proportion if present railroad rates remain unadjusted, and nothing but light business is likely to face distributors of other coals in this territory.

Inspection of comparative tonnage shows plainly the paralyzing effect of high tariffs all-rail on shipments here from central Pennsylvania. Eastern carriers who pro-rate with the New York Central and the Pennsylvania as well as with the anthracite roads have lost heavily in revenue because railroad rates have been kept on the extremely high after-war level, while coastwise bottoms have so nearly approached a 1914 basis that unless local conditions are unusual no consumer within 50 to 75 miles of tidewater rehandling piers such as those at Boston, Providence or Portland can afford to buy any but coal moving via Hampton Roads.

As basis for discussion it should be recalled that Pocahontas and New River have always had the advantage of relatively low operating cost and that only a few coals in central Pennsylvania can compete with the smokeless grades except at a broad differential. In normal seasons prior to 1915, nearly two-thirds of the supply for this territory came by water from Hampton Roads, Baltimore, Philadelphia and New York, the remaining third being received all-rail. Modern steam colliers, sometimes loading five cargoes per month, were freighting coal here for 45c. to 50c. per gross ton, making the combined transportation cost to Lowell, Mass., for instance, figure materially less than all-rail.

VIA HAMPTON ROADS

Tolls, mines to Tidewater	$1.40
Norfolk or Newport News to Boston	.45
Insurance, etc.	.02
Discharging, weighing, etc.	.21
Rail freight, Boston to Lowell	.85
	$2.93

VIA ALL-RAIL

Mines to Lowell	$3.25

This was the "equilibrium" that was practically undisturbed through the pre-war period. Steamers had been built so rapidly that coastwise shipping was actually in serious straits. Rates had ebbed so low that it was difficult to pay expenses, and charters were often unobtainable on any terms. The European War changed all that.

The revival of commerce came with a rush in 1916 and there were beginnings of a boom period for American shipping. Facing tremendous pressure for the movement of supplies the railroads, starved through inability to get increased rates, were caught not only with cars and motive power in poor shape but with trackage and terminal facilities far from adequate. Frequent embargoes threw a greater dependence upon water coal, but there, too, a shortage of bottoms tended much to restrict the volume coming forward.

Expansion in war industries, inequalities of car distribution, withdrawal of modern colliers for overseas transport all contributed to the tremendous push for coal that continued without abatement until the summer of 1918. Through this period, until June 25, 1918, tariffs all-rail were substantially unchanged, while water rates, Hampton Roads to Boston, rose to $3.50@$3.75. With heavy demurrage and other charges water coal often cost $3@$4 more than supplies all-rail, but to few consumers were the differentials of any moment.

The Fuel Administration budget for 1918 was to allow about one-third the total, or 10,000,000 net tons, for all-rail delivery that season. The 25 per cent advance in railroad rates, effective June 25, 1918, had practically no bearing on the general coal situation, for reasons already given. The advantage was still so much on the side of all-rail shipment that in the 1920 contract season, January to March, water rates being still on a relatively high level, Pennsylvania coals all-rail had the call. Consumers here who had patronized for a generation the smokeless districts were then asking to be excused, but the next horizontal rate advance, of 40 per cent, in August, 1920, making the new rates 75 per cent higher than before the 1918 increase, began gradually to lay its withering hand on shipments from central Pennsylvania and other districts which normally are a dependable source of supply for New England.

Meanwhile not only was the edge off the demand for coal but a great surplus of bottoms coastwise caused such a softening in water rates that the average on large vessels declined from $2 in November, 1920, to 85c.@$1 the second half-year of 1921. As might have been anticipated, the war emergency over, the rail-and-water route being economically less in cost, is gradually resuming its proper service to the large share of this territory that is easily accessible from tidewater rehandling plants. The danger lies not in restoring the old equilibrium but in creating a new state of unbalance that would have at least two objectionable features. Not alone does it tend to restrict all-rail service in large part to the narrow belt west of the Connecticut River and north of points like Springfield and Holyoke, Mass., which under present conditions can be reached both from New Haven, Conn., and from Boston; it also cripples the rail-and-water route from central Pennsylvania via Philadelphia and via New York.

It may be urged that a scaling down of operating costs, wages included, would in itself supply a corrective for central Pennsylvania and other districts, but it must be kept constantly in mind that the great bulk of these grades cannot compete with the smokeless coals on anything like an even basis at the tipple.

The current rate situation has so important a bearing on the diminishing receipts via the Hudson River gateways that emphasis should be given certain comparisons.

RELATIVE TRANSPORTATION COSTS TO SPRINGFIELD, MASS.

From Pocahontas and New River Districts

Tolls to Hampton Roads	$2.80
Marine freight to Boston	.85
Insurance, etc	.02
Rehandling Boston	.35*
Rail rate, Boston to Springfield	1.33
	$5.35

From Central Pennsylvania

Mines to Springfield	$4.72

*This is the railroad charge; private factors can discharge for much less.

Having regard for the $2 per gross ton figure f.o.b. mines on Pocahontas as against $3 per gross ton in central Pennsylvania for coals of navy acceptable grade it may easily be understood that the line of water competition is today much too far west to make for healthy conditions, whether for operators, railroads or manufacturers. There is no sound economic reason for enlarging the market for one producing region and restricting the outlet for another. Were it not for contracts entered into early in 1921 for comprehensive tonnages all-rail, largely on the part of New England railroads, receipts through the gateways would be far less than they are—as small, in fact, as they are likely to be, if rates are not corrected before the opening of another coal year.

At Lowell and Lawrence, Mass., the compariosn is even more impressive:

VIA HAMPTON ROADS

Tolls to Tidewater	$2.80
Marine freight to Boston	.85
Insurance, etc	.02
Rehandling, Boston	.35
Rail rate, Boston to Lowell-Lawrence	1.47
	$5.49
All-rail	$5.70

At Bangor, Maine, an important centre for the Northeastern section, the all-rail tariff figures $6.82, while vessels were discharged alongside at $1.10 from Hampton Roads, or a total transportation cost of $3.92 from mines in West Virginia via the rail-and-water route.

New England points are not the only ones affected; lines serving sections in Canada must also feel a loss in revenue. To Three Rivers, P. Q., the Clearfield rate is $5.55, while via Hampton Roads and the St. Lawrence River the combined rail-and-water freight has figured but $4.80.

The accompanying tables show, even in the dull year just ended, that all-rail coal traffic will recede to a marked degree under any such disparity in rates. The tariffs were advanced on a wholesale percentage basis broadcast without regard to local or sectional conditions, purely as an emergency expedient. From the effective date of the second advance, August 26, 1920, there has been only a sluggish demand for fuel. We need housecleaning, and a rectification of rates.

Persistent Efforts Made in Congress During 1921 To Pass Coal Legislation

Senators Calder and Frelinghuysen Sponsor Bills Framed to Regulate the Industry—One of the Measures Now Before Congress Aimed to Prevent Pollution of Streams Applies to Acid Water from Coal Mines

By J. D. A. Morrow
*Vice-president National Coal Association.

A BRIEF review of the legislative activities of the federal government in respect to coal in the past year properly begins with Senator Calder's bill for the regulation and control of the coal industry, introduced soon after Jan. 1. Its provisions are too well known to all coal men to require a restatement in brief form. It is sufficient here to say that they were impracticable and objectionable from many standpoints. The bill was referred to the Senate Committee on Manufactures, which was supposed to be favorable to the legislation proposed. That committee held hearings on the bill for more than a month, at which many well-known coal men testified. The evidence thus presented disclosed such fatal defects in the bill and revealed such objectionable features that the committee did not report the bill. Moreover, it was not possible for the committee to prepare a bill before the termination of Congress by constitutional limitation on March 4. That ended Senator Calder's bill for the year 1921.

Soon after the assembling of Congress in special session called by President Harding in April, Senator Frelinghuysen reintroduced his bill for regulation of the coal industry. This bill was referred to the Senate Committee on Interstate Commerce. The bill was ordered modified by that committee, which was done by Senator Frelinghuysen, and his bill was then reported favorably by the Committee on May 16 and put on the Senate calendar. He had also introduced a companion bill for seasonal coal rates. This bill also was reported favorably by the Interstate Commerce Committee on the same date. The National Coal Association took no action as an organization with respect to the seasonal freight bill, because our membership was divided on the merits of that legislation; some coal operators and districts were favorable to it, others opposed it. The bill was discussed in the Senate and on June 29 was recommitted to the Interstate Commerce Committee. This action was regarded as decisive in opposition to the bill and it has not since been taken up by the committee.

Senator Frelinghuysen's amended coal regulation bill which had been favorably reported to the Senate was considered by the National Coal Association at its annual convention in New York on May 19. A small committee, consisting of W. K. Field, E. E. White and Ralph Crews, was appointed to confer with Senator Frelinghuysen, Secretary Fall and Secretary Hoover, and to represent the association in further action on the bill. In Mr. Field's absence his place was taken by President Bradley. Conferences with the officials at Washington were unavailing in obtaining modification of the measure, so that it would not single out coal for special legislative action while still permitting the collection and publication of desirable statistical information. Opposition to the bill developed among producers, distributors and consumers of coal generally. The bill is still on the calendar. Senator Frelinghuysen in a speech on Dec. 22 gave notice of his determination to call it up for a vote before the end of the present session of Congress.

J. D. A. MORROW

One of the most significant subjects of legislative activity respecting the coal industry is stream pollution. In the present session of Congress several bills have been introduced to control the discharge of oils and oil sludges, acids and industrial wastes into harbors, navigable streams and their tributaries in the United States. One of these bills, introduced by Congressman Rosenbloom, of Wheeling, applies specifically to the discharge of acid water from coal mines. Hearings were held on this bill on Oct. 25 and on Dec. 6 and 7. The National Coal Association at both of these hearings explained the opposition of the coal industry to prohibitory legislation of this kind. S. A. Taylor, of Pittsburgh; W. D. Barrington, of the Consolidation Coal Co., and the writer appeared and gave information in detail regarding the composition of mine water, the quantity, the practical difficulties of complying with the requirements of Congressman Rosenbloom's bill, etc.

Secretary Hoover, who had been requested by the committee to present his views on the subject of stream pollution, recommended legislation to control immediately the discharge of oil and similar refuse, but advised against legislation at this time in respect to other industrial wastes. Instead, he urged that they should be investigated, particularly with a view to assisting industry to utilize these wastes in a profitable manner, if possible, and if not, to advise the cheapest means of rendering them harmless before enacting legislation to control the discharge of these wastes. The National Coal Association supported this recommendation of Secretary Hoover and was requested by the committee to assist it with information, especially from official sources, on the effect of mine water on streams. While the committee has not yet reported, there probably will be a serious study of stream pollution from industrial concerns of all kinds, including coal mines. Future legislation will depend upon the results disclosed by such investigations.

Coal Miner's Job Safe, but Accident Cost Grows Steadily

Injury Rate Per One Thousand Men Employed May Not Be Increasing but Total of Indemnities Paid by Operators Goes Up — Principal Recent Changes in Compensation Laws Benefit Mine Workers

BY E. W. DAVIDSON

IT IS exactly twice as dangerous to be a doctor as it is to be an American coal miner a mile from sunshine, attacking a working face with a drill. U. S. Census figures prove it. The miner, with a mortality percentage of barely 0.62, ranks twenty-sixth in a census list of thirty-five occupations. He is far below the sailor, who is at the top with a percentage of 2.26; the mason, who is fifth at 1.17, the merchant tenth at 1.06 and the clerk twentieth at 0.77. But in spite of his astonishingly safe position down between the stock raiser and the bookkeeper, he has accidents that are expensive to coal operation. For that reason, if for no other, the operator has a keen interest in the rather indeterminate trend of accidents during 1921 and in the few recent changes made in state workmen's compensation laws—changes mainly for the benefit of the miner.

Statistics on coal-mine fatalities for the whole country compiled by the U.S. Bureau of Mines show 1,794 deaths for the first 11 months of 1921 as against 2,077 for the same months the year before. This is a wholesome decrease of 14 per cent. But production slumped 127,382,000 tons. This brought up the 1921 average death rate per million tons from 3.55 to 3.92.

Figures from the same source covering only the anthracite fields show the same upward tendency in fatalities per million tons of output. During the first ten months of 1920 the rate was only 5.63, whereas during the same months of 1921 it reached 5.95. Anthracite production was up to standard too, though little coal was produced by dredges and washeries, which had a large output in 1920 with few fatalities.

Compensation for both ordinary injuries and fatalities the country over is paid by so many methods and through such varied agencies that complete statistics cannot be compiled. There are straws in the wind, however, that indicate the direction compensation is taking.

The accompanying table, covering all anthracite and bituminous coal mines in Pennsylvania, plainly shows that more money was going out in compensation payments in 1921 than was paid in 1920 because individual indemnities run larger.

In Illinois, on the other hand, the size of individual payments seems to be declining. Figures compiled by the Illinois Industrial Commission from such partial reports as reached that body show that during 1920 the individual average was $229, whereas the average for the first nine months of 1921 was but $198. The Illinois summaries record the number of accidental injuries for 1920 thus:

Deaths	171
Permanent total injuries	4
Specific loss	418
Partial loss of use	1,720
Disfigurement	1,238
Permanent partial	304
Temporary total	9,240
Temporary partial	154
Total	13,249

The total compensation paid and to be paid on these 13,249 cases is $3,032,253. For the year 1921 up to Sept. 1 there were 5,915 cases reported to the commission. When these cases are all indemnified, the commission estimates, the mine operators will have paid $1,171,161.

In Indiana accidents to coal miners increased during the fiscal year which ended Sept. 30, 1921. A total of 4,851 employees were hurt of whom 80 died, while during the previous twelve months 4,433 accidents occurred, causing 78 deaths.

State industrial insurance statistics reflect compensation activities interestingly. In Virginia for the year ended Oct. 31, 1921, the combined experience of all authorized coal-mine insurance carriers shows that the earned premiums totaled $199,021 and the incurred losses $106,675. These companies handled 391 cases. In addition to their losses the companies had an expense ratio of about 36 per cent of the earned premiums.

In the State of Washington the actual cost of insurance to the coal companies is 2¼ per cent. Under the law passed in 1921 the companies will pay about 10 per cent of their contributions into a fund for administering the act.

Ohio mine operators have paid $7,079,525 in insurance premiums between the time the coal-mine classification of state insurance became effective and Dec. 31, 1920. From this, $6,517,458 has been paid out in losses, leaving a reserve of $562,067.

Montana operators have the option of working under any one of three plans. Under Plan 1 they pay compensation direct to injured employees. Reports of all injuries and of all payments are made to the state Industrial Accident Board. Plan 2 is the insurance plan and Plan 3 the state plan. Plan 1, covering self-insurance, has proved the most popular. During the first eleven months of 1921 compensation payments under that plan totaled $51,762. Under Plan 2 the total was but $200 and under Plan 3, $31,000. The grand total for the state was $82,962. The board received reports in this period of 318 temporary total accidents, eight permanent partials and ten fatals.

In Alabama, where 80 per cent of the fatal accidents and 50 per cent of all accidents during the last two years occurred in mines, the State Compensation Commissioner estimates that mine operators are losing money by not adopting the state system of compensation. This system requires the payment of 50 per cent of a man's wages during temporary total disability due to accident. But some of the largest companies elect to settle with injured employees according to the companies' own scales, which often are higher than that of the state. Mrs. Marie B. Owen, Commissioner, says that during February and March, 1921, the Tennessee Coal, Iron & Railroad Co. alone overpaid compensation approximately $2,500.

Alterations in compensation laws recently have not been radical.

ILLINOIS AMENDMENTS HELP MINER

In Illinois four amendments in the Workingmen's Compensation Act took effect July 1, 1921, all benefiting the miner. The first raised the minimum indemnity rate on temporary total disability from $7 a week to $7 50 and the maximum from $12 a week to $14. The second increased the maximum payment for death from $3,500 to $3,750. Section 7, paragraph F, now provides that when an employee receives a pension award and later returns to work or becomes able to earn as much as before the injury, payments to him cease. The fourth change gives the Circuit Court power to review not only questions of law, as under the old plan, but questions of fact also.

Maryland has seen no changes in the compensation law since June 1, 1920, when four alterations were made. Disability payments after that date had to begin at the end of three days instead of two weeks. The amount of compensation for various injuries was increased from one-half to two-thirds of the employee's average earnings. The weekly minimum went up from $5 to $8 and the maximum from $12 to $18. Also personal representatives of deceased employees who were being paid compensation for permanent partial disability at the time of death, were given a vested right to the unpaid balance of the compensation.

The single change made in Kentucky reduced the basic coal rates from a maximum of $3.65 to $3.40 and fixed the minimum at $2.50 for each $100 of payroll.

Few and slight changes have been made in the Indiana compensation law since it took effect in 1915, but the original scale of amounts paid is maintained. The most radical change was the 1919 amendment making the act compulsory on all persons, partnerships and corporations engaged in mining coal and the employees thereof. Indiana probably is the only state in which one industry has been singled out for legislation of this character. The constitutionality of this provision has been tested in the courts. The U.S. Supreme Court finally passed on the matter last year, holding the act constitutional in this particular.

The rates charged by the stock casualty companies for workmen's compensation insurance on coal mines since 1915 have ranged from $4.75 down to $3.55. The bulk of the mines, however, have been insured in the Lynch Coal Operators Reciprocal Association at a very much lower rate because of a lower operating cost. It would be difficult to state the exact rates at which the business is being carried by either stock, mutual or reciprocal organizations, as varying rates are named by the stock companies on different risks and the costs under the mutual or reciprocal plan is the actual cost of compensation claims during any year plus the administration expense.

A Pennsylvania act passed at the last session of the Legislature made some minor changes in that state's compensation act. The principal change affected payments for disfigurements by striking out the words "a decreased earning capacity" and substituting "an unsightly appearance and such as is usually not incident to the employment." The period of compensation for disfigurement was cut from 215 weeks to 150. Another change increases the amount of compensation for the loss of a hand, arm, foot, leg, or eye from 50 per cent to 60 per cent of the employee's wages. The loss of two or more such members, if that loss does not cause total disability, requires a payment of 60 per cent instead of 50 per cent. Compensation rates were raised to a weekly maximum of $12 instead of $10 and a minimum of $6 instead of $5.

TENNESSEE PLAN UNPOPULAR

The Tennessee state compensation plan is unpopular with many of the large coal operators because some have found that they can operate under a self-insurance plan at a much lower cost. At present of eighty coal companies of the state forty-eight have elected to work under the provisions of the law, but the maximum annual production of the forty-eight does not exceed 1,500,000 tons. This is only 20 per cent of Tennessee's whole production, according to calculations made by J. E. McCoy, secretary of the South Appalachian Operators' Association.

Comments by coal companies on the Tennessee law show a variance of opinion. C. M. Gooch, of the C. M. Gooch Coal Co., of Nashville, while admitting that he finds the system expensive says: "We have found it to be very satisfactory. We have had two or three losses during our experience and have had no trouble whatever with settlements. Just as soon as an accident occurs in the mines, it is reported to our company, and with the exception of filling out a few papers, there is nothing for us to do, the insurance company making all adjustments with the insured's beneficiaries. This form is rather expensive, but we find that it carries perfect protection."

L. Clark, secretary-treasurer of the Highland Coal & Lumber Co., of Nashville, whose company elected to go under the compensation act, says the company is carrying insurance in an old line company at a cost of 2½ per cent. "The results," he sums up, "have been very satisfactory to us and to the men. We prefer the present conditions to those existing prior to the passage of the law in 1919."

On the other hand the Cross Mountain Coal Co., the Coal Creek Leasing Co., both of Knoxville, the La Follette Coal & Iron Co., of La Follette, Tenn., and other companies in the same region take a different attitude.

"We did not elect to come under the Workman's Compensation Act, and our experience has proven very beneficial," runs a letter from G. M. Camp, of the Coal Creek Leasing Co. "We estimated our cost under this act would have been something like $6,000 a year, and the amount paid for minor damages since this act was passed has not exceeded $500 per year. One of the neighboring mines did come under this act and the cost to them for the first year in which they carried it was approximately $8,000, and during this time they only had two minor accidents which I judge could have been settled out of court for not exceeding $500."

HERE'S A BIG BILL

The cost of coal-mining accidents in Illinois for twenty months is shown in this table, compiled from accident and compensation reports in the office of the Illinois Industrial Commission:

	1920	1921 to Sept. 1
Fatal	171	79
Non-fatal	13,078	8,836
Compensation paid	$1,534,057	$516,528
To be paid	1,370,521	654,633
Medical and funeral	127,675	....
Total paid and to be paid	$3,032,253	$1,171,161

H. W. Van Benchoten, secretary and treasurer of the Cross Mountain Coal Co., expresses himself thus: "This company did not elect to come under the Compensation Act, and does carry compensation insurance at the present time. Our annual average expense settling claims, after taking care of doctors' and hospital fees, amounts to $1,500. This average figure does not, of course, include the year of our explosion, which, if included in the average, would make a very material addition."

"This company is not operating under the workman's compensation law, because the cost of the insurance required by the law is unreasonably high," says L. C. Crew, president and general manager of the La Follette Company, "and the bond that the insurance department of the state insisted that we put up in case we carried our own insurance, was also, according to our judgment, unreasonably high.

"Besides, our policy is to deal with our men direct in case of accident instead of having an insurance adjuster trying to make settlements. Many of these adjusters haven't sufficient experience and leave the men and their families in a bad frame of mind, which, in the long run, makes trouble for the employer."

J. H. Bowling, general manager of the Sun Coal Co., of Lexington, Ky., operating in Caryville, Tenn., says the experience of his company indicates operation under the Tennessee law is "probably three times as expensive" as operation under the old system.

NO CHANGE IN LAWS IN SOUTHWEST

In the Southwestern coal fields efforts have been made to change the existing compensation laws but without material effect. In Kansas a bill to increase the compensation and put the administration of the act in the hands of the Kansas Court of Industrial Relations was killed in the State Senate. In Missouri a bill vesting the control of compensation matters in a new commission and providing competitive insurance for carrying such liabilities by the employer will be referred to the people next November.

The State of Washington has not altered the amounts paid under the workmen's compensation law but a change in the administration of that law has resulted from the consolidation of a number of state boards. Minor changes have been made, however, in both the industrial insurance law and the state safety law. For instance, the medical aid was combined with industrial insurance and all is under the direction of the Supervisor of Industrial Insurance. The section of the medical aid law permitting contracts between employers, employees and doctors or hospital associations was amended. It now places these contracts under the direct supervision and control of the Supervisor of Industrial Insurance and authorizes him to require bond on all such contracts for their faithful performance. Merit ratings and penalties for safe places and safety devices were abolished. Today all merit ratings and penalties are fixed according to the safety educational standards maintained by employers and on experience cost as shown by the cost of industrial insurance.

Changes and amendments have removed many of the imperfections of state laws on compensation and the experience of operators with these laws varies from pole to pole, but the general tendency of the cost of accidents is upward. Though injuries per thousand men employed may not be on the increase the total cost of them obviously is a growing factor in mine operation.

MARKET REVIEWS

Markets and Production in 1921 and Forecasts by Our Correspondents in Leading Cities and Coal Fields—Diagrams and Tables of Spot Prices of Coal and Operating Records of Producing Districts

New England Bituminous Conditions in 1921

Trend of Traffic Is Toward Water Routes—Pocahontas and New River Return to Favor Because of Lower Wages and Reasonable Marine Rates—Reduced Costs and Constructive Policies Needed

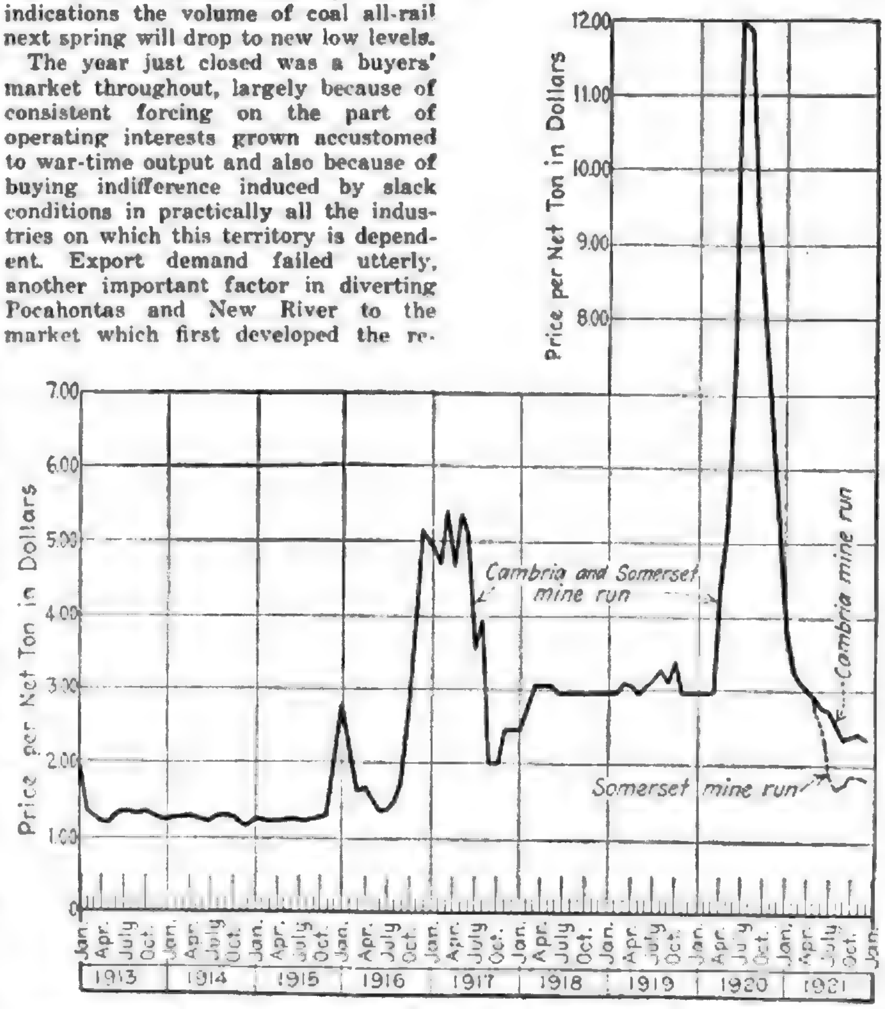
By G. G. Wolkins
Boston, Mass.

APATHETIC buying and the return of Hampton Roads coals to their pre-war market were the leading features of steam trade in New England during 1921. Overdevelopment in the bituminous districts was matched by overplanted industry here, and the record of the entire twelve-month period is one of hope too often deferred. Except in a few special lines the retail consumer of manufactured goods refused to buy more than minimum quantities and no favorable forecast proved of any value. Requisitions for steam grades went naturally in increasing measure to the West Virginia smokeless fields, where mining costs are lowest, and these regions were brought within easy reach by the continuing slump in shipping, a development that had already caused serious concern during the latter half of 1920.

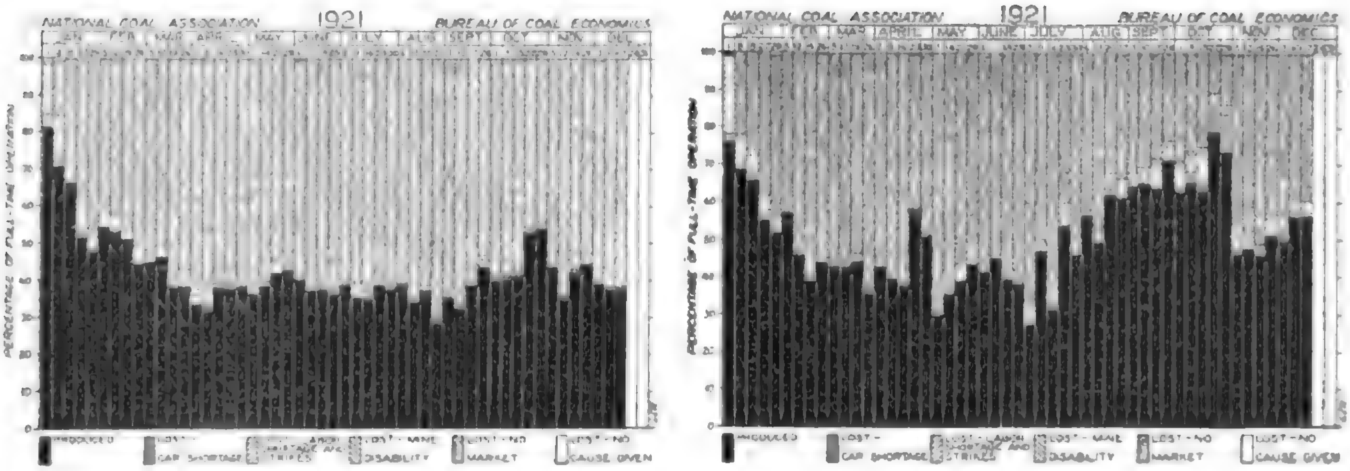
Stock piles on Nov. 1, 1921, were nearly on a parity with those in the corresponding month of 1918, a year when New England was glutted with fuel, and yet the total tonnage received was less even than in 1919. It all means that large reserves were carried over from the previous year and, further, that actual consumption was relatively light. There were multiplied instances where large users deliberately decided upon purchases but 40 per cent of the previous season's. A few, the railroads among them, bought liberally early in the year, only to regret the heavy quotas that came forward on contracts at times when the spot market had become almost demoralized.

The pendulum, which a year ago had swung so far toward the all-rail route, has now swung back toward water-borne coal to the extent shown in the illustrative tables. Taking 1921 as a whole the division will be nearly equal, but as the months go on there will be seen a steady recession in the tonnage received via the Hudson River gateways. Contracts for locomotive fuel placed during January-March tended to maintain the all-rail percentage to a higher point than might otherwise have been the case. As pointed out elsewhere in this number in an article on "Rail-and-Water vs. All-rail in New England" (p. 109) the ratio of commercial receipts to railroad-supply coal consistently diminished through the four months. Most of these railroad-fuel contracts will expire during the first three months of the new year, and unless we are much misled by current indications the volume of coal all-rail next spring will drop to new low levels.

The year just closed was a buyers' market throughout, largely because of consistent forcing on the part of operating interests grown accustomed to war-time output and also because of buying indifference induced by slack conditions in practically all the industries on which this territory is dependent. Export demand failed utterly, another important factor in diverting Pocahontas and New River to the market which first developed the resources of these rich fields. When the line trade west and southwest, as well as the trade south and offshore, stopped absorbing tonnage early in the autumn, New England was substantially the only outlet open to the Hampton Roads agencies. The extent to which this opening was worked is reflected in prices which established the smokeless grades as once more closely competitive, even in centers well inland from Tidewater. To see cargo after cargo divided up among the elect of Yankee cotton mills was convincing evidence that war conditions were being wiped out and that coal merchants had quit dabbling in the markets of the seven seas. With the manufacturer and coal operator both scratching to find a home



SPOT PRICES F.O.B. MINES ON THE BOSTON MARKET OF MINE-RUN COAL FROM CAMBRIA AND SOMERSET COUNTIES, PENNSYLVANIA



Central Pennsylvania

Somerset County, Pa.

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

outlet our "splendid isolation" had arrived with a vengeance!

Meanwhile reputable all-rail shippers were obliged grimly to witness the ground being cut from under their feet. For five years numbers of them had resisted highly lucrative off-shore business; they had delivered absolutely a full quota on each contract; and now when they were ready to realize on their decent, foresighted policies, low-cost coal from West Virginia pre-empted their "dependable" market. There are times when virtue is its own sole reward.

In 1921 coal was again the chief commodity carried by our railroads. Without it they would have been in sad straits. Lack of general traffic compelled lay-offs in increasing number from month to month. Only by most rigid economy is railway management now able to make any showing whatever. There still is far too much padding in our costs, for unless they are trimmed down in some drastic manner we shall find ourselves distanced by people elswhere who are less hampered in their daily employments. For those willing to heed, 1921 has its lesson, for not in years has there been such demand for constructive measures in distribution. All interests suffered from unintelligent, hit-or-miss methods, and if ever there was room for improvement it is right now, practically at the beginning of a new year, when there should be some interchange of counsel with an eye to some rational scheme of better co-ordinating output with consumption. Could the Appalachian region be dealt with as a whole the twelve months beginning April 1, 1922, might be spared some of the shadows of the coal year soon ending.

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM SOMERSET AND CAMBRIA COUNTIES, PA., BY MONTHS, 1919-1921 QUOTED ON BOSTON, MASS., MARKET

	Lump	Mine Run	Screenings
1919			
January	....	$2.95	....
February	....	3.00	....
March	....	3.10	....
April	....	3.00	....
May	....	2.94	....
June	....	3.05	....
July	....	3.14	....
August	....	3.28	....
September	....	3.22	....
October	....	3.38	....
November	....	2.95	....
December	....	2.95	....
1920			
January	....	2.95	....
February	....	2.95	....
March	....	2.95	....
April	....	4.38	....
May	....	5.28	....
June	....	7.35	....
July	....	11.97	....
August	....	11.88	....
September	....	9.38	....
October	....	8.02	....
November	....	6.72	....
December	....	5.32	....
1921			
January	....	3.80	....
February	....	3.26	....
March	....	3.05	
April	....	2.99	
May	....	2.90	
June	Cambria	2.72	Somerset
July	$2.81	....	$1.84
August	2.55	....	1.68
September	2.37	....	1.73
October	2.40	....	2.13
November	2.41	....	1.84
December	2.38	....	1.82

MARKET'S AIMLESS TREND

From the beginning the only reports that could be thought encouraging were those of operations shutting down. In January it was announced that certain groups of mines in Pocahontas would work but three days weekly; in December the same groups were operating only two days per week; and that embraces the year's record of one of the most important and productive bituminous districts. Conditions in central Pennsylvania varied only in degree. It was with great reluctance that operators granted concessions from prices they had felt in the spring were reasonable under the circumstances. They were most anxious, many of them, not to affect their strategic position with labor, and we have a long record of gradually softening quotations.

While it was still winter there was a feeling that the patient would get well, but no one wise enough came forward to fix a time for recovery. It was said to be "from sixty to ninety days ahead," but not only was there a steady recession during summer and autumn but the last days of December saw the lowest figures heard at any time during the year. It was nothing unusual for manufacturers to report five months' reserve, and as surely as they dipped into a "bargain" market just as surely would they be appraised of even lower offers later on. The steady scaling down of successive bids for government supply, navy and other requirements opened every argument for indecision and delay, an attitude that was characteristic of the buying public throughout the period. Such a spread between contract figures and those for spot shipment made by the same operators was bound to promote diffidence. No mill buyer could justify seasonal arrangements on any such differential when coal was palpably in supply far beyond wildest guesses at the tonnage to be consumed.

Through the summer general business dragged heavily; price was no inducement, and the few sales negotiated evidenced a policy of extremely spare and close-hauled buying. Besides the disposition on the part of many not to purchase, there was the retail buyers' strike to be reckoned with, and each week disclosed more pressure to move coal. Quotations were individual and the range quite wide; they seemed not so much dependent upon competitive offers as upon special situations at particular mines. B. & O. coal was early to be had at $1.50@$1.75 per net ton when in central Pennsylvania similar grades were being held $2.25@$2.50. By Sept. 1 it was plain to all there could be no life to the market the remainder of the year. Pennsylvania operators might leave no stone unturned to get business, but the time of recovery had been postponed indefinitely; the cards were stacked against them, and from one to two days was the best week's business they could hope to provide.

HAMPTON ROADS COALS IN FOREFRONT

The market continued during the autumn under the same extraordinary pressure. The average manufacturer was not warranted in producing more goods than the restricted market could readily absorb. There was nothing to imbue any faith in current coal prices, and the steady forcing that followed was clearly foreseen. It was throughout a heavy market, dragging along at minimum output and at the lowest prices in several years.

Settlement of the British strike made it certain the smokeless agencies would face a stagnant market, with New England almost the only debatable territory. There was progressive weakening in price from late January, but not until March, when coastwise freights and the f.o.b. mines basis had both been modified, did it appear that Pocahontas and New River would make such inroads on all-rail territory. Deliveries by both routes declined notably, Tidewater even more than rail, for the year as a whole in actual tonnage, but the percentage by water showed an increase, by far the largest part of which was transshipped at Norfolk and Newport News. The shippers of these coals were assiduous in their attentions to buyers in this market, and to a moderate degree they got results. New England became their main dependence, as appeared the seven-day period ending Dec. 3, when but two small cargoes represented the total Hampton Roads dumpings for export!

From $5.75@$6.25 per gross ton f.o.b. vessel at Hampton Roads in February the range wobbled through the dull summer and autumn until at length late in December $4.40 ($1.52 gross f.o.b. mines) became the open price for navy acceptable grade. Contracts had been underwritten at $3.50 per net ton f.o.b. mines, later to be scaled down to $2.10 @$2.25, but the significant move came early in the coal year, when the navy and the Panama R.R. were able to buy easily at $3, even though practically every bid had been made on a much higher basis. "Market cargoes" became a habit, and by November highest grade coals were sacrificed at an average return of less than $1 per gross ton at the mines. It was no surprise when Pocahontas and New River operations were closed down, many of them week by week, for no organization could tolerate indefinitely any such competitive campaigning.

The extent to which the smokeless coals drove out Pennsylvania grades through the peculiar rate differential and apparent disregard of costs is presented elsewhere in this number, but the fact remains that Worcester, Lowell, Lawrence and Fitchburg are again using Southern coking coals much as they did in years prior to 1914. The Pocahontas and New River agencies have taken possession of the largest share of New England consuming territory, and it is predicted that receipts next year from Hampton Roads will be nearer 70 per cent of the total than the bare 45 per cent that approximately records their performance the current year just ended.

Complaints of poor preparation have been almost the rule of late concerning the smokeless coals reaching this market. For a considerable time it looked as if operators in their eagerness to cut down costs had crowded output unduly the days the mines worked. In other words, if a mine was worked but one day a week the output was nearly as large as two normal days would have produced. The obsession of war-time production dies hard!

RAILROAD FUEL

The New England railroads are among the few steam users to whom all-rail shippers have reason to be grateful. Railroad purchasing agents placed contracts early in the year, and to a greater extent than any other one class of buyers they have accepted and even now continue to accept reasonable monthly quotas. Some purchases of locomotive coal were rather in excess of actual requirements, as traffic panned out, but with these adjustments there has been a broad-minded way of dealing, and operators and selling agents are pleased over the outcome of most of these commitments.

Accurate figures are not available covering receipts of railroad supply coal by water, but in the judgment of the trade the proportion has been materially less than via all-rail. The higher volatile coals pay higher rates to the transshipping piers, and except for supplies stored at or near Tidewater the tendency of the railroads through such a season would be to accept rail coal on yearly contracts.

Of late there has been an effort to check rather than increase the flow of supply coal, and while there has been an occasional slight increase in general traffic it has been so gradual that there has been no such appreciable effect on consumption as would be caused, for instance, by continuous cold weather. Railroad exchequers are for the most part in a depleted state and 90 to 120 days' supply is regarded as ample for all contingencies.

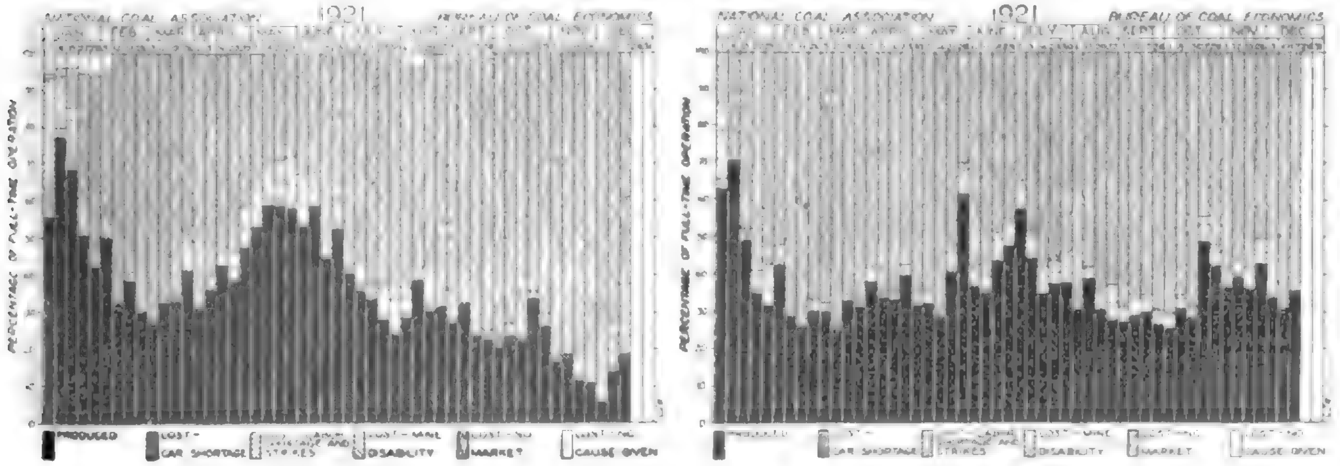
PENNSYLVANIA GRADES

For reasons already entered into the movement here of steam coals from the Cambria, Clearfield and Somerset districts was far less into New England in 1921 than during the previous year. After the contract-making period, prices sagged to the point where in each individual case the mine owner figured a cost level below which he could not afford to dig coal. In a measure this will account for the wide range of prices quoted on these grades during the season.

At the close of the year, it is safe to say, the percentage of spot coal crossing the Hudson River for that part of this territory east of the Connecticut River was very slim indeed. The great bulk of this coal was moving on contract, together with small tonnages on current sales to points out of reach from the Hampton Roads factors at New Haven and the ports north and east.

The water route was of no practical use to Pennsylvania shippers throughout the year. At New York and Philadelphia piers the tonnage dumped for New England was the lightest since pre-war times. Rates to some extent, but mostly the higher cost of mining, put these fuels by rail and water more than out of the running. In the autumn there were several charters at 80c.@ 82½c. from Norfolk and Newport News to New York harbor, where Pocahontas and New River came to be regularly received for bunkering purposes. The Pennsylvania contractors had to bow themselves out.

A further sidelight on bunker trade was furnished in August, when one of the transatlantic lines sent the S.S. "Winifredian" to Hampton Roads from Boston, light, for 2,700 tons bunker coal, only to return here to load general cargo. It was manifestly a demonstration against local prices, and the own-



New River Field

Fairmont Region

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

ers were said to have saved $3 per ton, but the diversion used up seven days, and the time of a ship that size must be a consideration.

A factor in decreased bituminous tonnage for New England is emphatically the gradually extended use of fuel oil in manufacturing plants of many kinds. Within ninety days it was stated officially by the Fuel Administrator for Massachusetts that an import duty of 25c. per barrel on fuel oil and 35c. per barrel on crude mineral oil will in one year add directly $5,000,000 to the fuel bill of this territory alone. While the entire Mexican output is said to have risen about 17 per cent from 1920 to 1921, the demands of all New England were greater by 47 per cent and those of Massachusetts by 91 per cent.

IMPORTATIONS OF CRUDE OIL.

[In Thousands of Gallons.]

	1918	1919	1920	1921
New England	113,779	154,371	448,317	*600,000
Massachusetts	35,616	48,552	235,703	*450,000

*Estimated.

Importations are almost all from Mexico.

Abstracted from a memorandum to the Committee on Finance of the United States Senate, October 25, 1921, by courtesy of E. C. Hultman, Fuel Administrator for Massachusetts. Analyses show that average fuel oil has 18,300 B.t.u. A careful test made in a Massachusetts mill showed 163 gallons of oil (approximately four barrels) the equivalent of one net ton of bituminous.

Otherwise expressed, we are told that "Mexican oil now constitutes 22 per cent of New England fuel" for steam purposes aside from steam railroads. Statements such as these are predicated upon a normal annual bituminous requirement of 24,000,000 net tons, a figure barely reached in the hectic year 1918. The trade also has in mind that Mexican oil wells will not for long be allowed to supply buyers with crude fuel oil exclusively. A time probably will arrive when refining processes will be put into practice on an increasing scale, and so long as bituminous coal is held on a reasonable price basis there is not so much to fear from the competition of oil as a fuel.

Late in December there had been no material change in trade conditions. While there was a disposition to hold Pocahontas and New River quotations on a less wobbly basis, consumers actually interested in the current market were easily able to cover their requirements still at bargain prices. Purchases that otherwise might have been made were withheld until January should come in. There were enough "market cargoes" to justify postponement on the part of any steam user not under compulsion to buy. The background, large reserves also considered, was anything but inspiring for the trade.

At the same time a fair degree of good merchandiznig was being carried on, particularly among those factors in Hampton Roads coals who were careful to buy and charter at close figures and took care also to sell the bulk of each cargo before arrival at this end for distribution. A few houses, specially competent, did a wholesome business on this basis during several months.

It is important that early in the new year consideration be given to the railroad rate problem. The threat of English coal exposes some of the rate absurdities and Mr. Hoover's recommendation of a reduction of $1 per ton on overseas coal from the mines to the Atlantic ports may fix attention in some quarters on a matter that demands intelligent study. There are signs among certain of our textile industries that the goods market is again slightly on the mend. It remains to be seen whether the coal industry — mine owners, mine workers, carriers and distributing agencies — will keep step. Something more than haphazard methods and stiff-necked insistence upon "rights" will be called for if the trade is to regain anything like the stability and good name that it deserves.

There have been whisperings of a low "opening price" on the smokeless coals. It is clear that the bulk of New England's consumption this year also will be supplied via Hampton Roads. Should $2.80, the present toll, remain in effect to Tidewater for coastwise shipment a price level f.o.b. mines will of necessity preserve about the range that now obtains on the spot market. Operators in the smokeless districts have seen their mines shut down much of the time since May 1, 1921; they also have seen their restricted output move in considerable volume to New England; and they know that if Pennsylvania mine labor adheres to a war-time scale they need have little anxiety over competition from that direction. These are elements to be taken under prudent advisement, and upon their wise handling will depend the character to be given the new coal year.

Pennsylvania Coals Undersold in New York by Pocahontas and New River Fuels

Stove in Constant Demand and Egg Easy to Procure Throughout the Year—Passing of Tidewater Coal Exchange and Wholesale Coal Trade Association Much Regretted—Bunkers Quoted Around $7 Alongside

EDITORIAL CORRESPONDENCE

ONE of the outstanding peculiarities of the anthracite trade in New York during 1921 was the constant demand for stove coal and the ease with which egg coal could be obtained. It was peculiar owing to the fact that a few years back the favored size of domestic coal was egg. The trade was fortunate with regard to weather conditions, which were just the reverse of those prevalent in the early part of the previous year. Demand was not strong and consumers kept their wants supplied without buying any more than they really needed.

There was considerable fluctuation in quotations in January. Independent quotations changed frequently. Washery stove and chestnut were quoted at around $7.60 per ton while fresh-mined independent product was nearly $3 higher. The situation both as regards supply and prices improved considerably during the next couple of weeks, but demand did not increase proportionately, because consumers apparently were determined not to be caught with considerable coal in their cellars on April 1, the beginning of the new coal year, when in previous years the usual spring discount of 50c. per ton for domestic coals went into effect.

No amount of salesmanship could induce buying in the early part of March and during the last half of the month the companies with one exception announced the usual spring discount on domestic sizes. If these cuts were made with the expectation that householders would buy fuel for the following winter, and there is no doubt that they were, they went astray. Buying did not increase to any great extent.

By the end of June retail dealers began to complain of slow buying. This was followed by easier demand, cancellation of orders with the operators and lower quotations for independent coals.

A line on what the dealers thought

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM CLEARFIELD DISTRICT, BY MONTHS, 1919-1921

QUOTED ON BOSTON, MASS., MARKET.

	Lump	Mine Run	Screenings
1919			
January	....	....	....
February	....	....	....
March	....	$2.43	....
April	....	2.45	....
May	....	2.45	....
June	....	2.45	....
July	....	2.50	....
August	....	2.83	....
September	....	2.75	....
October	....	3.10	....
November	....	....	....
December	....	....	....
1920			
January	....	2.95	....
February	....	....	....
March	....	....	....
April	....	4.55	....
May	....	5.25	....
June	....	6.69	....
July	....	11.32	....
August	....	11.07	....
September	....	8.75	....
October	....	8.54	....
November	....	6.13	....
December	....	4.31	....
1921			
January	....	3.00	....
February		2.64	....
March		2.53	....
April		2.34	....
May		2.38	....
June		2.25	....
July		2.01	....
August		2.12	....
September		1.90	....
October	....	1.95	....
November	....	1.91	....
December	....	1.80	....

of the future was obtained by the public when bids were opened late in July by the Board of Education for supplying domestic coals to the various school buildings in Greater New York. Bids ranged from $12.39 to $14.33, which in most instances were lower than the then existing retail prices, and it was announced by the Board of Education that a saving of at least $300,000 had been effected as compared with the previous year's prices.

The slow demand, however, did not prevent the companies, with one or two exceptions, from adding the usual 10c. per ton monthly advance to their regular price list. It was estimated Sept. 1 that only between 65 and 70 per cent of the coal usually placed in bins at that time by local retail dealers had been put away. Retail dealers, however, were optimistic and had their yards overstocked with all sizes except stove. Egg coal, which during the early months had been difficult to get in most quarters, was much easier and shippers began to notice that the demand was centering on chestnut together with stove.

Householders unable to put in more than a ton or two of coal at a time began to enter the market early in September and the retail trade became more active.

The market was extremely quiet in December. Independent quotations slumped and as far as steam coals were concerned it was a buyers' market. Shippers and sales agents at times were willing to accept offers for buckwheat, rice or barley coals, so anxious were they to move them in order to save demurrage charges. Egg coal became so plentiful that companies were storing it, and others, it was said, undertook to break it down. Railroad sidings were blocked with loaded cars of domestic coals, one company alone being reported to have had upward of 800 cars of egg coal on its hands.

A feature of the local bituminous situation was the bringing to New York harbor of considerable Pocahontas and New River coals at a delivered price little in excess of the mine price of good Pennsylvania coals. These coals, however, were for the most part distressed tonnage on the piers at Hampton Roads.

The discontinuance of the Tidewater Coal Exchange, Inc., was much regretted by many of the trade, as was the suspension of the functions of the Wholesale Coal Trade Association of New York, Inc.

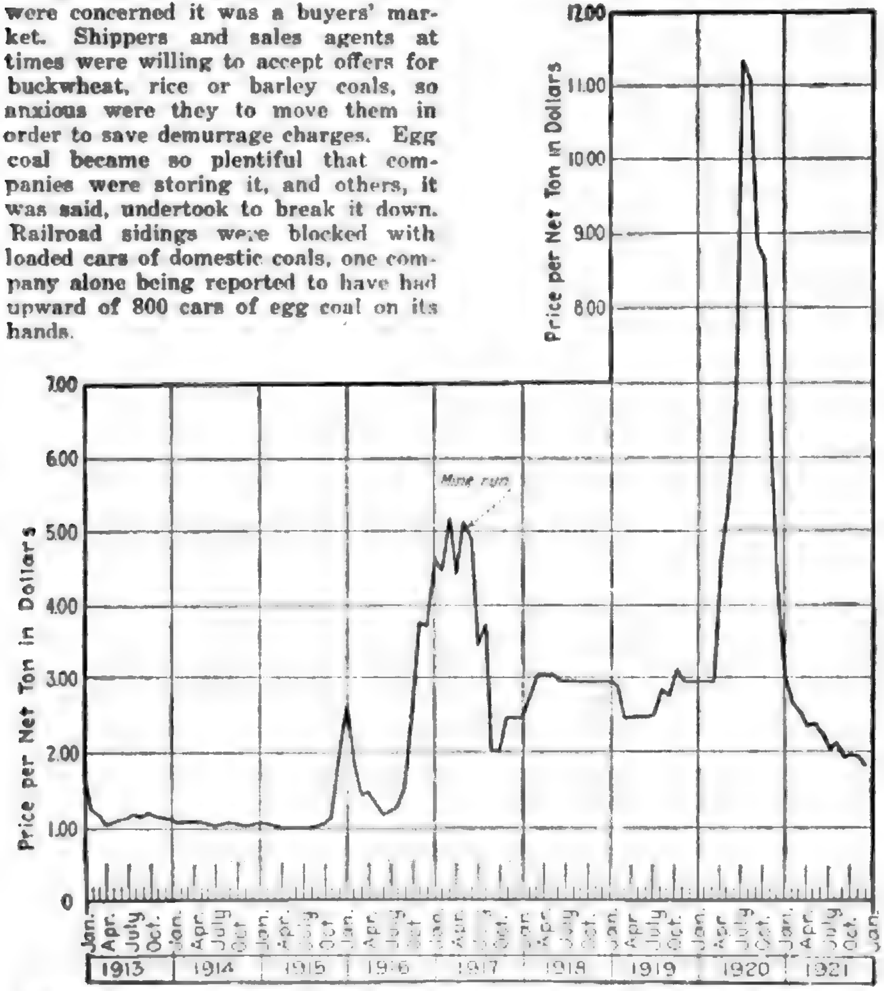
Some efforts were made early in the year to close contracts but operators in most instances stood "pat" at quotations ranging from $3.75 to $4.50, which at the time were higher than current quotations for spot coals of equal quality. Judging from the inquiries received at the time it was thought that large consumers were ready to sign up, but, as one operator expressed it, "That's about as far as they have gone." It was afterward said that most of the contracts were not closed. Quotations for long-time contracts were later reported as ranging from $3 to $4.50. The opening of bids for furnishing about 750,000 tons of the better grades of coal to the Panama Railroad Co., which took place early in the year in New York City, showed prices ranging from $3.50 to $4.39 per ton.

Early in April it was said that most operators would have to depend upon spot buying to keep their mines going, it being asserted that only about 5 per cent of the usual number of contracts had been closed. An effort was made at this time by the National Association of Purchasing Agents to induce contract signing—with little success.

Early in the autumn the low prices of Pocahontas and New River coals compared with the quotations for the better grades of Pennsylvania coals familiar to the local trade resulted in heavy shipments of the former coals to local industries and public utilities. The low prices at which these coals were said to have been obtained was due to the quantity of distressed coals at the Southern ports and the slump in water freights. Quotations for Pool 1, which contained these coals, ranged from $6 to $6.25 alongside.

The threatened strike of the railroad workers did not cause any flurry in this market. Consumers from the first did not expect any serious trouble, and for that reason did not rush orders calling for immediate delivery. Certain operators and shippers, however, believing there would be a tieup, rushed coal to tidewater, which resulted in another setback and caused the unloading of considerable coal at low prices.

Early in December the market was quiet. Buyers were not placing orders except when they needed coal. With the beginning of the new coal year three months off there was some talk of renewing contracts. It was reported that one house doing considerable bunkering of steamships was naming quotations around $6 alongside.



SPOT PRICES F.O.B. MINES ON THE BOSTON MARKET OF MINE-RUN COAL FROM THE CLEARFIELD DISTRICT OF PENNSYLVANIA

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM INDIANA 4th AND 5th VEIN DISTRICTS, BY MONTHS, 1919-1921

QUOTED ON CHICAGO, ILL., MARKET

	Lump	Mine Run	Screenings
1919			
January	$2.55	$2.35	$2.05
February	2.60	2.35	2.10
March	2.68	2.40	2.11
April	2.70	2.40	2.15
May	2.70	2.40	2.15
June	2.75	2.45	2.00
July	2.82	2.54	1.89
August	2.85	2.60	1.90
September	3.25	2.90	2.60
October	2.55	2.35	2.05
November	2.55	2.35	2.05
December	2.55	2.35	2.05
1920			
January	2.55	2.35	2.05
February	2.55	2.35	2.05
March	2.55	2.35	2.05
April	3.11	2.83	2.57
May	3.75	3.10	3.90
June	4.52	3.94	3.75
July	5.48	5.56	5.21
August	6.00	5.75	5.45
September	7.12	6.46	6.30
October	6.57	5.43	4.64
November	5.78	4.42	3.55
December	4.22	3.24	2.63
1921			
January	3.53	2.54	2.23
February	3.17	2.17	1.63
March	2.96	2.55	1.75
April	3.07	2.74	1.90
May	3.39	2.95	2.00
June	2.94	2.53	2.21
July	2.89	2.53	1.76
August	3.09	2.88	1.84
September	2.97	2.95	1.68
October	2.81	2.52	1.57
November	3.10	2.57	1.66
December	3.11	2.59	1.73

Baltimore Profits by British Mine Strike

Sends Surprising Amount of Coal to England and Ireland — Total Exports Drop Off Two-Thirds — Live Business Slumps and Gas and Steam Prices Go to Pieces

By W. R. Hough

THE YEAR 1921 was most depressing in the coal trade at Baltimore, but the new year already promises better things.

The depression of 1921 was the most marked at its close. The line demand, as well as bunker and export trading, was at exceptionally low ebb, and the hard-coal situation also was subnormal. The principal drop-off came in exports, which were only about one-third the total of 1920. Last year 260 ships carried 1,449,035 tons of cargo coal from Baltimore to ports in 29 different countries, and of these 182 took 161,611 tons of bunker here. The total amount shipped from Baltimore during 1920 was 4,396,772 tons of cargo coal.

A singular feature of the trade for 1921 was the shipment of 308,489 tons of coal in 47 ships to the United Kingdom during four months of the year beginning in April. This was caused by the shortage of fuel superinduced by the strike of the British coal miners. For the same reason 116,874 tons of coal in 21 vessels went to Ireland from Baltimore. Today, with British ships working, American coal cannot compete with English.

The shipments to the various other countries during the year and the number of vessels carrying these cargoes were:

Argentine, 16 ships, 92,843 tons; Bahama Islands, 1 ship, 149 tons; Brazil, 3 ships, 3,769 tons; British West Indies, 1 ship, 546 tons; Chile, 2 ships, 11,689 tons; Colombia, 1 ship, 1,050 tons; Costa Rica, 1 ship, 1,721 tons; Cuba, 6 ships, 17,093 tons; Denmark, 8 ships, 32,060; Dutch Guiana, 1 ship, 659 tons; Ecuador, 2 ships, 4,176 tons; Egypt, 19 ships, 123,270 tons; France, 19 ships, 110,182 tons; Germany, 2 ships, 11,149 tons; Gibraltar, 1 ship, 3,707 tons; Holland, 12 ships, 85,872 tons; Honolulu, 1 ship, 7,322 tons; Italy, 56 ships, 344,741 tons; Mexico, 1 ship, 799 tons; Norway, 4 ships, 25,673 tons; Peru, 3 ships, 8,613 tons; Porto Rico, 3 ships, 1,830 tons; Portugal, 7 ships, 39,142 tons; Russia, 2 ships, 10,865 tons; Spain, 3 ships, 13,911 tons; Sweden, 12 ships, 47,674 tons; Uruguay, 5 ships, 23,167 tons.

Line business reached new low levels in 1921. Starting off in January, prices for best gas and steam coals ranged between $3.75 and $4.25 per net ton f.o.b. mine basis. Then things grew worse both as to demand and prices until at the close of the year the coal trade found itself running at a low production point and still unable to sell its products in many cases even at actual cost of production and distribution. During the rush period of eighteen months or so ago the best steam coals sold up to $12 to $15 a net ton. Now they are procurable in this market at from $2 to $2.30 a net ton mine basis.

In the matter of prices the market reached its lowest level of the year in December, when best grade steam coals in pool 1 were obtainable as low as $2.35 per net ton f.o.b. mines; pool 9, $2.15; pool 10, $1.90@$2; pool 11, $1.70; and pool 34, $1.40@$1.50. At the same time best gas coals also were far from normal, excellent pool 61 being offered on this market at $2.10@$2.15, with Pennsylvania mine run around $2, and West Virginia lump about the same. West Virginia run-of-mine ranged all the way down to $1.60 during December. The high level for the year was in January, when pool 1 was worth $4.50 a net ton f.o.b. mine and pool 9 $4@$4.25. Such coals as pool 11 were at that time selling around $2.50.

Over-keen competition bore heavily on the trade toward the end of the year. This was especially true in the hustle for bunker business. In some cases the best steam coals, such as ran to pool 71, were contracted for at a gross ton price at piers of $4.40. This meant a sale on a net ton basis at the mines of considerably less than $2, and indeed ruinous price.

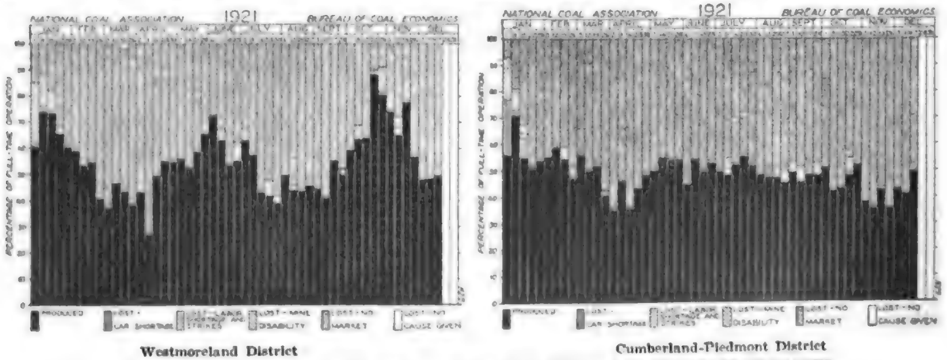
In the hard-coal trade overhead costs to retail dealers, especially yard rentals, have increased, but the trade has held down the cost as compared with that charged in 1920. The following table shows the price range:

Hard white ash—	Aug., 1920	Apr., 1921	Oct., 1921
No. 1 (broken)	$15.50	$14.50	$14.75
No. 2 (egg)	15.50	14.50	14.75
No. 3 (stove)	15.75	14.75	15.25
No. 4 (chestnut)	15.75	14.75	15.00
Pea coal	13.00	12.00	12.00
Buckwheat	10.00	9.00	9.00
Sunbury—			
No. 2 (egg)	15.50	14.75	15.00
No. 3 (stove)	15.75	15.00	15.50
No. 4 (chestnut)	15.75	15.00	15.25
Lykens Valley—			
No. 2 (egg)	16.50	15.50	15.75
No. 3 (stove)	16.75	15.75	16.00
No. 4 (chestnut)	16.75	15.75	16.00

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM POCAHONTAS REGION, BY MONTHS, 1919-1921

QUOTED ON BOSTON, MASS., MARKET

	Lump	Mine Run	Screenings
1919			
January	....	$2.35	....
February	....	2.35	....
March	....	2.61	....
April	....	2.58	....
May	....	2.54	....
June	....	2.91	....
July	....	3.21	....
August	....	3.84	....
September	....	3.77	....
October	....	4.25	....
November	....	2.35	....
December	....	2.35	....
1920			
January	....	2.35	....
February	....	2.35	....
March	....	2.35	....
April	....	4.06	....
May	....	6.87	....
June	....	9.78	....
July	....	10.00	....
August	....	12.90	....
September	....	10.60	....
October	....	10.31	....
November	....	8.40	....
December	....	6.83	....
1921			
January	....	3.97	....
February	....	2.86	....
March	....	2.59	....
April	....	2.68	....
May	....	2.99	....
June	....	2.95	....
July	....	2.63	....
August	....	2.38	....
September	....	1.91	....
October	....	1.76	....
November	....	1.74	....
December	....	1.74	....



Westmoreland District

Cumberland-Piedmont District

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

Last Year Was a Period of Reconstruction in Bituminous Coal Industry of Philadelphia

Anthracite More Stable as to Prices but with Noticeably Lessening Demand—Textile Plants the Best Customers—Railroads' Purchases Hampered by Industrial Conditions and Limited Finances

BY W. D. HAMMER
Philadelphia, Pa.

IN all things 1921 was a year of reconstruction, particularly noticeable in bituminous, with slow but constantly decreasing prices to the end of the year. Anthracite was more stable as to prices, but with a very apparent tendency to a lessening in demand for the family coals, from egg to pea inclusive.

During the first two months of the year the demand for anthracite was equal to the supply. To the end of March the schedule of company prices was as of the previous September; per gross ton as follows: Egg, $7.75; stove and nut, $8.05; pea, $6.40. Steam sizes at this time were: Buckwheat, $4.25; rice, $3.15; barley, $2.25. The independent operators during the first sixty days of the year were able to get on an average of from 35c. to 40c. a ton higher than companies on domestic coals, although there were exceptional cases where $10 a ton at the mines was received on small lots of scarce sizes. As March approached, however, there was much talk of a reduction in prices by the big companies, and this together with some mild weather sent the consumer demand to a low level. In the meantime all producers shipped heavily to the dealers, who stocked the coal, as there seemed to be some assurance that despite the public expectation of a drop in prices, the old schedule would hold. Some dealers, though, finding business dull, made price cuts of $1 a ton to the consumers, bringing the retail figures in March about as follows: Egg, $13.50; stove and nut, $14; pea, $10.50.

The producing companies which are always looked to as the leaders were slow in announcing their price policy for spring and it was actually April before some of them sent out schedules, and with the exception of one company they made a reduction of 50c. a ton, bringing the mines prices at that time to the following level: Egg, $7.25; stove and nut, $7.60, and pea, $5.90. Independent prices at this time were from 10c. to 20c. higher on stove and nut and 30c. to 40c. lower on pea. On steam sizes a drastic cut was made, due to the bituminous competition, and contract prices of $3.50 on buckwheat, $2.50 on rice and $1.50 on barley were announced.

As the retail men were so heavily stocked with coal they immediately made a drive for business, but the consumer needed much more urging than usual, with industrial conditions such that money was scarce. The demand for the larger sizes, however, was quite strong all summer, at least to such an extent that the independents were able to get premium prices of 50c. to 75c. over company coal.

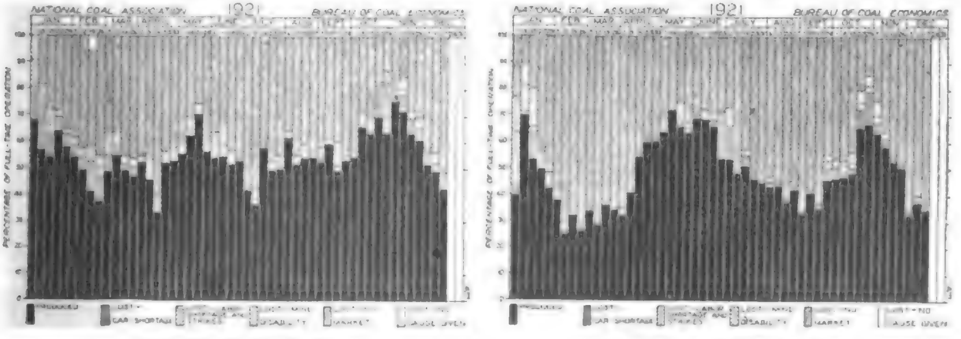
In June company prices were considerably increased, running about $7.45 to $7.75 for egg, $8.10 for stove and nut, and $5.95 to $6.10 for pea, although the retailers did not increase their figures at this time. The steam sizes were inclined to be a trifle weak and sold from 25c. to 50c. off by the independents. All summer long there was some lack of snap to the retail trade, although they all continued to take in coal as fast as the operators shipped it, stove being in somewhat short supply. With another company advance in circular prices during July to $7.75 for egg, $7.80 for stove and nut, and $6.05 for pea, and independent coal close to 75c. higher, the retail men finally made their first price increase. This brought the standard retail prices about as follows: Egg, $14; stove and nut, $14.25, and pea, $11.

There was a fair retail demand right through the summer up to Sept. 1, but never at any time up to the retailers' expectations, although they continued to take in all the coal they could get. In September company prices were increased to what finally constituted the winter schedule, being as follows: Egg, $7.75; stove, $8.10; nut, $8.05, and pea, $6.20. Most dealers gradually increased their delivered prices until in October the prevailing quotations were: Egg, $14.25, stove and nut, $14.50, and pea, $11.25. In October also the retail trade picked up quite noticeably, and most people in the trade thought that normal buying had arrived at last, but it happened at this time the railroad men had been agitating a gigantic country-wide strike, and with the removal of this menace by November there was a noticeable slump in the retail trade.

Throughout November, despite almost normal weather, the consumer could not be induced to buy, and retailers became so anxious for trade that there was considerable price cutting. At first this was not particularly noticeable, but finally it reached the stage where pea, which had been stored in particularly heavy volume and with a less than usual demand, was being offered freely in some sections of the city at $10.50 a ton, and in a few instances at $10.25. The larger sizes while not slashed so extensively, nevertheless felt the hand of the cutter, and $13.75 for stove and nut became common.

The softening in evidence in November became even more pronounced in December, despite some spells of cold weather which ordinarily would have been productive of good consumer trade. As the year came to a close, however, the lack of buying ability on the part of the consumer became more significant in the buying of numerous small lots to meet current needs, and then husbanding this to the utmost extreme. The yards of the dealers became so congested with coal that they had to hold orders and this was reflected in curtailed mining operations, the first for at least six years.

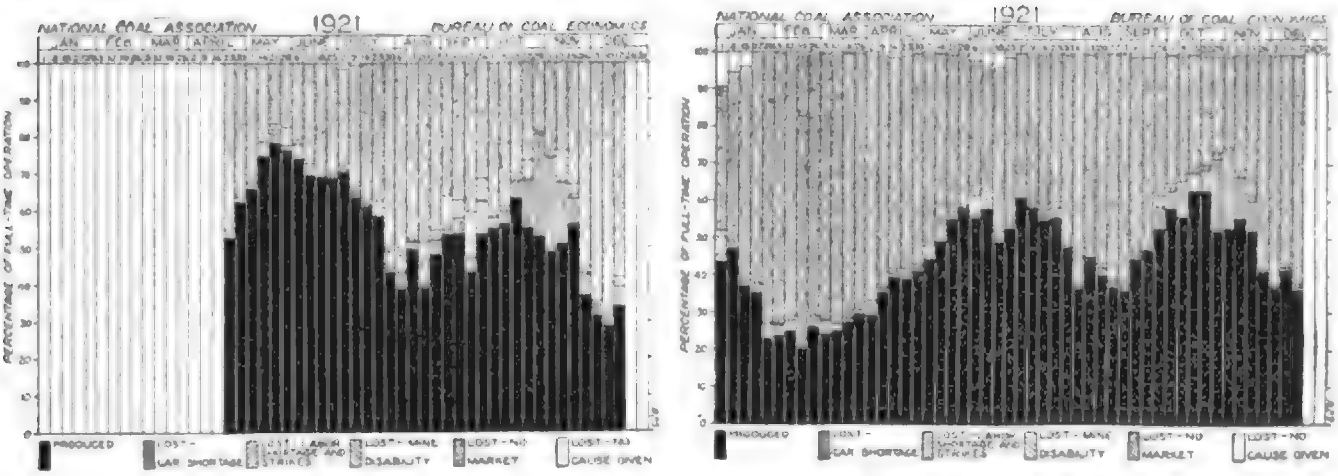
During the last days of the month a few of the independent operators re-



Panhandle District, W. Va.

Winding Gulf District, W. Va.

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES



Tug River District. W. Va. Logan District, W. Va.

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

duced mines prices to a level with company coal on stove and nut, $8.10, and lower yet on egg and pea, the former running from $7.60 to $7.75 and the latter from $5.25 to $6. Under such conditions as have prevailed during December the outlook for the beginning of the new year is not altogether promising. The retailers seem determined to reduce stock and are buying as little as possible, and in addition retail prices show signs of further weakening.

From the beginning of the year the bituminous trade was unsatisfactory and practically at no time showed any improvement. To begin with, the larger users had heavy stocks on hand from the previous year, and with money conditions considerably tightened there was a disposition to take a chance on the market right from the first, which tendency grew stronger right through the year.

Starting out in January, prices for coal were about as follows: Pool 1, $4.75 to $5; Pool 9, $4.50; Pool 10, $3.75 to $4; Pool 11, $3.25 to $3.75. Producers also began to indicate their ideas as to contracts at this time, giving their impressions that $4 to $4.50 was a fair contract figure, but the consumer showed little or no desire whatever to enter into agreements, preferring to work from stock or take a chance on the market.

By April 1 prices began to move downward slowly but surely. The year's history of bituminous can easily be traced in the price movements to always lower levels. The operator was hopeful at all times that bottom had been reached as to prices, and when $3 was touched for Pool 9 coal there was a certainty that it could go no further, yet when this coal was sold at even lower figures, such as $2.50 to $2.75 in November, that was declared to be the absolute minimum.

Naturally with the constantly dropping spot market the few holders of contracts became uneasy and there were frequent adjustment of contract figures, until toward the end of the year $3.50 was about the general figure for this business, although the amount under agreement probably was the lightest on record.

Under the conditions recited above the poor-grade coals soon lost their outlet, and the consumer when he did buy usually asked for the better coals, such as Pools 1, 9 and 10. Despite the fact that the Tidewater Coal Exchange was discontinued, the system of referring to coals under the pooling arrangement continued to persist in the line of domestic trade, although there is at this time an effort among certain of the larger producers to discard the system altogether, they preferring to sell their high-grade coals under their trade names. However, the pooling plan possesses so much merit it is believed it will be years before both the producer and the consumer are willing to abandon it entirely.

During the year past probably the best customers of the producer have been from the textile industry in this territory. This branch of trade seemed to recover from its slump more quickly than any other line and has supplied good buyers for the greater portion of the year. Of course the railroads have been taking a fair tonnage, but under industrial conditions prevailing throughout the year and with restricted finances they have shown a tendency to stock only a limited tonnage in advance of their needs.

Bituminous Coal Market of Buffalo in Comatose Condition Throughout Past Year

Shippers Entertain Little Hope for Improvement—Prospective Shortage the "Open Sesame" to Good Profits—Strike Scare So Overworked That Actual Suspension Would Have Little Effect

By John W. Chamberlin

In Buffalo the bituminous coal market has been flat throughout the year 1921, although there have been what may perhaps be called degrees of slackness that afford a little variety in what is still without real improvement. Shippers, whether producers or jobbers, seem to have been engaged in devising new names for the trade in order to give proper vent to their disappointment, and in some cases to their utter discouragement, for they do not see much improvement possible for a long time. The foreign markets, for other things as well as coal, is not going to return to anything like the old volume that was the case before the war, perhaps not in a series of years.

The country has the coal, but, looking at the situation from a seller's viewpoint, this is the real basis of the difficulty. Bituminous coal can be produced so cheaply that it seldom pays a good profit unless there is some special reason for a shortage, like a big strike or a prolonged scarcity of cars. The strike scare has been so overworked during the year that it is not going to advance prices much, if any, even if there is a suspension in April, for the consumer has coal and he is much more indifferent to the cutting off of a supply than he would be if the demand for goods was brisk.

Buffalo gets its soft coal from the Allegheny Valley and such near-lying districts as Reynoldsville and Shawmut, and after that chiefly from the Pittsburgh district proper, added to some that is near it, such as the Bessemer district. Lately what is commonly known as Pittsburgh No. 8, coming from over the Ohio line, is gaining pretty fast on the other districts. Jobbers say it was a case of necessity, to save that market from the encroachment of non-union West Virginia mines. West Virginia has tried to get into the Buffalo market, but without success so far. For this reason several Ohio mining and sales companies have lately opened branch offices in Buffalo, for this coal has come to stay and must be looked after. It sells about on a par with Pittsburgh steam grades. During the year considerable coal has begun to come in from the Monongahela districts south of Pittsburgh, perhaps best called Connellsville coal. It pays 15c. a ton over Pittsburgh, but being mostly non-union and so having a mining cost of at least 75c. a ton less than Pittsburgh, it can absorb the extra freight.

As to prices, the old delivered-price quotation has been dropped and only mine prices are given. Taking Pittsburgh as a basis, which with No. 8 furnishes Buffalo two-thirds of its soft coal, the close of 1920 had seen the end of the big flurry of August and September, with prices down to $3.50 for Youghiogheny gas lump. This was supposed to be the bottom, but it kept sagging off all the year, till Dec. 1, 1921, saw it selling not above $2.75 and then going to a mere "what-can-you-offer" price. One shipper declares that when a customer offers him what he formerly paid he at once looks up his credit.

The year closes with a clean slate—no best customers who will pay fair prices, no industry taking anything like normal amounts, every consumer buying cheap coal, if any; the banks reducing credits, but not on coal shippers or consumers especially; the Nova Scotia coals trying to supply Canada, but not creating any great uneasiness in the Pennsylvania trade—yet everybody hopeful and expectant. April may clear away many clouds. Buffalo normally sells about 15,000,000 tons of all coals annually, but with the bituminous output down to seven-tenths of normal, this figure has been reduced proportionately.

Tendency of Detroit Coal Market in 1921 Was Steadily Downward

Automobile Industry Seemed Best Able to Withstand General Depression — Trade Is Optimistic but Uncertain — Substantial Reserves Must Be Worked Off Before Improved Buying of Coal Can Be Expected

By E. E. Dunbar

THROUGHOUT 1921 the course of the coal market in Detroit was regularly downward, the declination corresponding rather closely with the succession of months. Though the influence of the business depression was apparent in certain narrowing markets for the products of some plants, the automobile industry, including the makers of parts and accessories, was able for a considerable time to withstand the depressing force.

Mine quotations on West Virginia lump of high quality at the first of the year were ranging around $5, with egg about $4.50, run-of-mine $3.50 to $4 and nut and slack $3. Ohio lump was bringing about the same price as the West Virginia product and little or no distinction in prices was made between the two districts for fine coal. Wholesalers and jobbers found it difficult to interest buyers, as most of the large consumers, under the influence of the prosperity of the inflation period and with the idea of avoiding the shortages in supply by which they were handicapped during war years, had purchased liberally in the later months of 1920, building reserves of unusual proportions, which they were carrying over into 1921. The yards of retail dealers, also, were carrying unusually large stocks in consequence of their having followed a liberal buying policy to avert a repetition of the shortages that had created troublesome problems the previous winter.

As the season advanced the downward trend of mine prices created a disinclination to purchase. In the attempt to shorten losses there were numerous cancellations of contracts.

The opening of the new coal year, April 1, found both buyers and producers unwilling to arrange new contracts and little business was done in that line. The influence of the business depression was being felt among the industrial plants to an increasing degree. Many still had large reserves, while the declining prices on bituminous in the spot market encouraged a belief that coal could be had at any time and perhaps might be bought at a lower price by waiting.

This expectation was quite generally realized, as in July prices on lump from West Virginia or Ohio mines had fallen to about $3.25 per ton at the mines, with egg quoted around $2.50, mine run at $2.25 and nut and slack about $1.25, while prices later in the year were even lower.

The automobile factories by a series of price reductions were enabled to maintain a moderate degree of activity, which made it possible for them to provide for their needs by purchases at irregular intervals in small quantities and by picking up bargain lots, following a sort of hand-to-mouth policy.

With an active demand for coal for lake shipment and numerous mines curtailing production, while some were closing, the movement of coal into Detroit was largely restricted to shipments to apply on contract.

The threat of a railroad strike in October caused only a brief flurry in the Detroit market for bituminous coal.

The close of the Lake season shut off one of the principal outlets for lump coal and curtailed the production of slack, which speedily became scarce, with prices showing a strong tendency to advance. In the final week of the year nut and slack from Ohio mines were practically unobtainable at prices lower than $1.50 while quotations on the smokeless and the West Virginia products were firm at $1.25 and nut and slack from mines of the Pittsburgh No. 8 district were held at $1.75.

Despite the low prices, buying demand was not in evidence and efforts by wholesalers and jobbers to interest customers were met with a disappointing lack of success. The jobbers say that despite the small volume of business during the year, most of the steam coal users were able to accumulate rather substantial reserves by their purchases of bargain lots, the outcome being that nearly all the steam plants are in comfortable position as regards supply for the present and the near future. The retail yards also are well stocked, both because of additions made to their supplies during the year and because of the slow progress they had made in distribution up to the year's end.

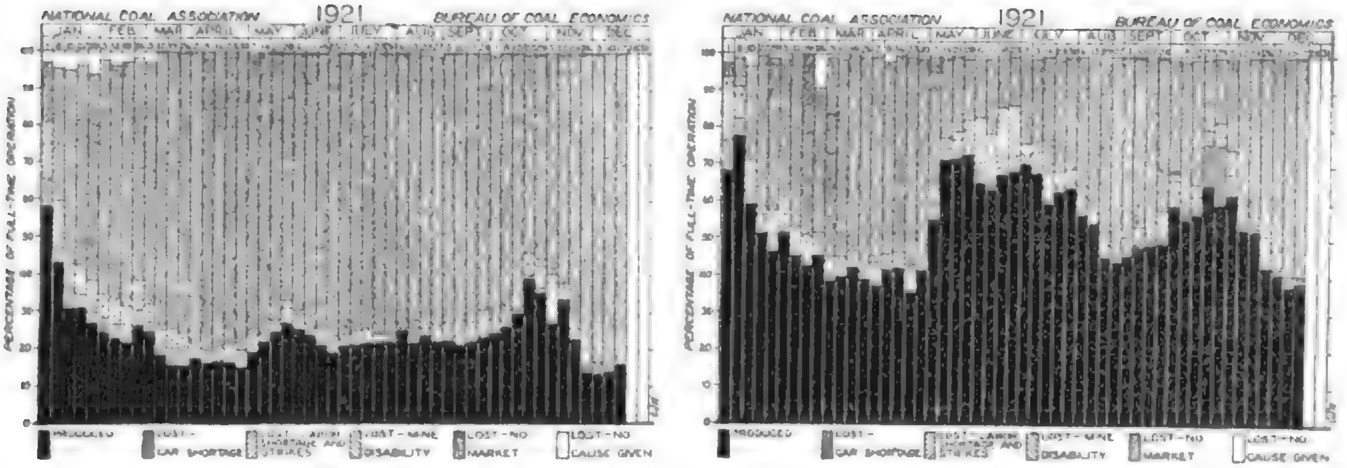
Though high-grade coal from West Virginia mines has been the leader in popularity during the year, there has been a favorable market also for Hocking and other Ohio coals. Little or no coal from the Illinois or Indiana mines is reported to have come to Detroit during the year. The coal from those states, which was forced on the city during the régime of the federal Fuel Administration, does not, in normal times, find a market here.

Through the latter part of the year, the greater proportion of the West Virginia coal reaching Detroit is reported to have come from the unorganized districts. Operators of union mines in West Virginia and in Ohio have been unable, the jobbers say, to meet the prices of coal from Logan County and other unorganized districts of West Virginia.

Though inclined to be optimistic, rep-

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM HOCKING DISTRICT. BY MONTHS, 1919-1921
QUOTED ON COLUMBUS, OHIO, MARKET.

	Lump	Mine Run	Screenings
1919			
January	$2.75	$2.50	$2.25
February	2.75	2.50	2.25
March	2.75	2.59	2.25
April	2.66	2.18	1.67
May	2.54	2.21	1.38
June	2.54	2.14	1.42
July	2.64	2.10	1.30
August	2.77	2.02	1.40
September	3.18	2.35	1.93
October	3.34	2.42	2.16
November	....	....	....
December	....	....	....
1920			
January	2.75	2.50	2.25
February	2.75	2.50	2.25
March	2.75	2.50	2.25
April	3.78	3.47	3.18
May	4.28	4.03	3.91
June	5.76	5.69	5.53
July	6.25	6.30	6.08
August	7.38	7.07	6.70
September	7.25	6.45	6.72
October	7.80	6.96	6.71
November	5.91	4.91	4.47
December	4.83	3.63	3.23
1921			
January	4.25	2.44	1.70
February	3.82	2.32	1.63
March	3.46	2.21	1.65
April	3.25	2.23	1.59
May	3.27	2.18	1.50
June	3.25	2.15	1.20
July	3.20	2.13	1.21
August	3.13	2.14	1.46
September	3.43	2.13	1.25
October	3.24	2.03	1.06
November	3.23	2.09	1.05
December	3.08	1.95	1.12



Southern Ohio District
Eastern Ohio District

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

resentatives of the coal trade in Detroit frankly admit they can do little but guess about the future. The belief prevails that if business in industrial lines reverts to anything like normal by April 1 or earlier, the coming year probably will develop a strong and continued demand for coal. It is pointed out, however, that before any considerable volume of buying can be expected, the reserves now in possession of retail dealers and steam plants will have to be worked down to a small proportion of their present size.

Many Ohio Coal Companies Close 1921 Accounts On Wrong Side of Ledger

Production Falls Far Behind Normal Level of Recent Years—Price Fluctuations Hold Interest—Preference Shifts to Smokeless and Semi-Smokeless Coals—Stress Preparation to Sell Ohio Product

BY J. W. LEHMAN
Columbus, Ohio

MANY of the corporations and firms engaged in the coal industry in Ohio will be in red figures when they close their accounts for 1921. It was just one thing after another which brought about this state of affairs. Foremost was the industrial depression, which assumed big proportions by April and May and which reduced consumption of steam coal to a serious extent throughout the entire year.

Statisticians of the Southern Ohio Coal Exchange estimate the production of coal in Ohio in 1921 at 32,179,000 tons. To Sept. 30 about 23,501,165 tons were produced and the output in October is estimated at 2,987,800 tons, in November at 2,690,750 tons and in December, 2,000,000 tons.

OUTPUT FIGURES FOR RECENT YEARS

Compared with 32,000,000 tons in 1921 production in Ohio in 1912 was 34,444,000 tons; in 1913, 36,285,000 tons; in 1914, 18,736,000 tons; in 1915, 22,627,000 tons; in 1916, 34,526,000 tons; in 1917, 41,678,000 tons; in 1918, 47,919,000 tons; in 1919, 35,226,000 tons; and in 1920, 45,227,000 tons.

With a capacity production of about 4,500,000 tons monthly in all Ohio fields the estimated output by months in 1921 was: January, 2,980,719 tons; February, 2,305,624 tons; March, 2,338,050 tons; April, 2,187,678 tons; May, 2,989,035 tons; June, 3,117,874 tons; July, 2,948,459 tons; August, 3,090,003 tons; September, 2,715,724 tons; October, 2,985,800 tons; November, 2,590,750 tons; December, 2,000,000 tons.

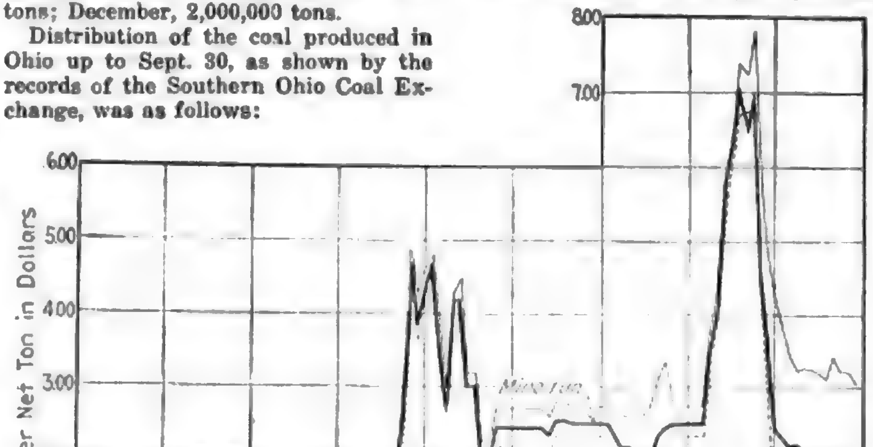
Distribution of the coal produced in Ohio up to Sept. 30, as shown by the records of the Southern Ohio Coal Exchange, was as follows:

DISTRIBUTION OF COAL OPRODUCED IN SOUTHERN OHIO, JANUARY TO SEPTEMBER, INCLUSIVE
(Exclusive of non-revenue railroad fuel)

Market	1920	1921
Commercial	6,368,447	2,883,595
Railroad fuel	1,703,390	1,301,517
Lake cargo and bunker	1,716,870	719,023
	9,788,607	4,904,135
EASTERN OHIO		
Commercial	10,497,528	6,337,729
Railroad fuel	2,278,222	3,203,914
Lake cargo and bunker	4,173,982	4,255,387
	16,949,732	13,797,030

June and August were the months of largest output; December was the smallest. In January the production was close to 3,000,000, but it fell off to slightly more than 2,000,000 tons in April, to come up again when Lake traffic became more active. In October production was stimulated to a certain extent by the threat of a railroad strike, which caused rather heavy stocking on the part of certain industries and also by dealers.

Price fluctuations during the year are



SPOT PRICES F.O.B. MINES ON THE COLUMBUS MARKET OF COAL FROM THE HOCKING DISTRICT, OHIO interesting. The general tendency was downward, dating from late in January, and at the close of the year the lowest price levels were recorded. Starting with January, Hocking lump was selling in the neighborhood of $4; mine-run around $2.65 to $2.80 and screenings around $1.50 to $1.75. But the mild weather which prevailed, coupled with a falling off in industrial activity, caused a lessening in the demand, and by the end of the month the drop started. It was small at first but seemed to gain momentum as the season progressed.

By April the break was under full speed and the opening of the Lake trade failed to stay the movement to any extent. Prices settled down to $3 for lump, $2.30 for mine run and $1.10 to $1.25 for screenings soon afterward. There were several spurts in the price of screenings during the latter part of the year, but these were caused principally by curtailment in lump production rather than in increased demand for that size.

With the lower prices and the abundance of offerings there was a distinct change in the demand for coal in many Ohio cities and communities. Formerly Hocking and Pomeroy lump have played an important part in the consumption of central Ohio householders, but with cheap coal coming from both West Virginia and Kentucky, a decided preference for those coals developed. Consequently Hocking and other Ohio-mined grades suffered to a marked degree. The tendency is still toward the smokeless and semi-smokeless coals of the Southern States and this probably will continue for some time. Demand from Michigan points also changed materially, but not to such a large extent as the people of Ohio showed. One of the factors which brought this change about was the cheaper cost of producing coals in the non-union fields of West Virginia, with only a small freight differential to protect Ohio operators.

Some of the larger companies started the year on the policy of maintaining their prices but when the break occurred—in April, or thereabout—they were compelled to lower their quotations or cease operations. It was a question of making good prices and also of paying a lot of attention to preparation and shipping instructions to get orders during the remainder of the year. In fact the question of preparation cut more figure than ever before and salesmen who sell Ohio-mined coals have been stressing the point of preparation in order to book orders. Preparation probably will be one of the keystones of the Ohio domestic trade during the coming year.

At the close of the year stocks in the hands of retailers were extra large for that time of the year. In fact dealers stocked up to a large degree on the threat of the railroad strike which failed to materialize, and this coal is generally higher priced than coal that could be bought at present to replace it. Consequently there is little immediate prospect for much improvement in the demand from retailers. In fact it will take quite a long spell of real winter weather for the trade to feel the effect of steady buying on the part of retailers. Dealers also are loath to place orders now, even if their stocks are somewhat depleted because of extra large outstanding credits which they are unable to collect from householders. The industrial depression is responsible for this state of affairs.

Among the steam users, the best customers, outside of the railroads, of course, are the public utilities and state and county institutions. Public utilities, which buy the resultant sizes only, have been rather steady purchasers and often have been the backbone of the market. Industrial concerns have been buying by fits and starts as a rule and their reserve stocks are generally large when industrial conditions are taken into consideration. When cheap coal would be offered they would generally accumulate some surplus, to see the prices still further reduced at the next offering.

The fact that banks have been slow in extending credit has not affected the Ohio coal trade to any great extent. While some dealers might have been prevented from accumulating larger stocks, as a rule retail stocks are larger than ever before. Factories generally had the financial aid necessary to accumulate stocks, especially when offerings were attractive.

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM KANAWHA DISTRICT, BY MONTHS, 1919-1921.

QUOTED ON COLUMBUS, OHIO, MARKET.

	Lump	Mine Run	Screenings
1919			
January	$2.85	$2.60	$2.35
February	2.90	2.60	2.25
March	2.95	2.50	2.20
April	2.75	2.59	2.15
May	2.75	2.50	2.10
June	2.60	2.48	2.00
July	2.80	2.71	2.15
August	3.10	3.06	2.30
September	3.60	3.53	3.00
October	4.25	3.61	3.25
November	2.85	2.60	2.35
December	2.85	2.60	2.35
1920			
January	2.85	2.60	2.35
February	2.85	2.60	2.35
March	2.85	2.60	2.35
April	4.63	4.38	4.00
May	4.63	4.38	4.13
June	6.00	5.86	5.21
July	7.55	6.85	6.75
August	9.00	7.75	7.57
September	8.69	7.44	7.34
October	7.92	7.29	6.99
November	6.10	5.13	4.63
December	5.08	3.85	3.35
1921			
January	4.47	2.57	1.88
February	4.11	2.46	1.65
March	3.50	2.32	1.50
April	3.39	2.24	1.48
May	3.38	2.35	1.43
June	3.48	2.19	1.23
July	4.20	2.07	1.20
August	3.25	2.09	1.45
September	3.43	2.10	1.27
October	3.28	2.05	1.14
November	3.29	2.03	1.13
December	2.96	1.88	1.04

Pittsburgh Region Is Choked by Unionism

High Wages Prevent Competition with Nearby Non-Union Mines—Production Drops to 25 Per Cent of Normal While Open-Shop Fields Operate 75 Per Cent

By B. E. V. Luty

FROM a market standpoint the Pittsburgh coal district embraces the region south and southwest of Pittsburgh up to but not including the Connellsville region, and is union throughout. The Connellsville region has always been open shop, and there are open-shop mines in Westmoreland County, east of Pittsburgh, as well as in West Virginia. This non-union encirclement shaped the market condition in the Pittsburgh district from early in 1921 to the close of the year.

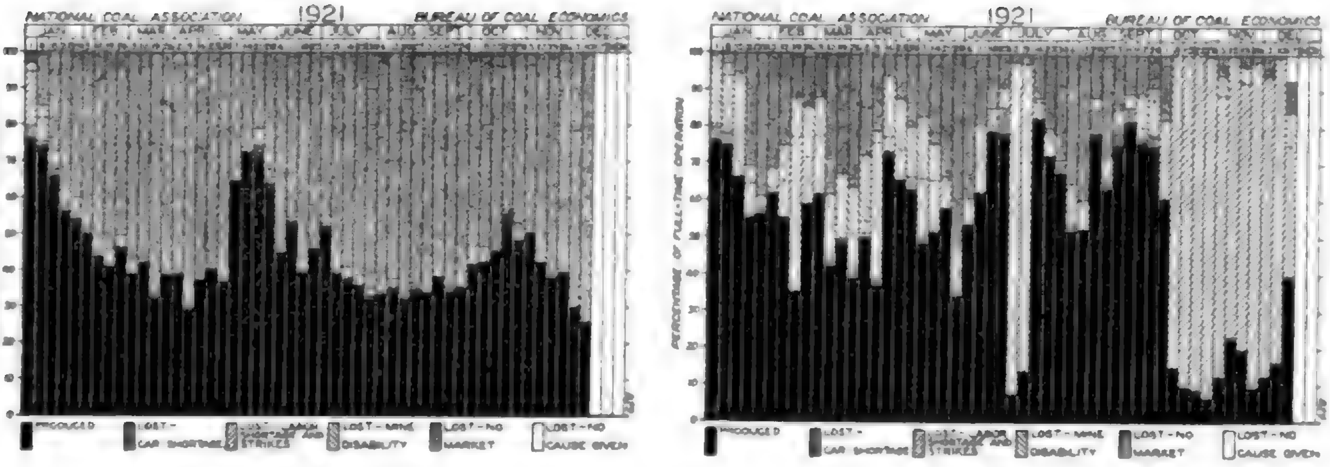
The Connellsville region and other open-shop districts reduced wage rates from the inflated levels produced by the war and post-war conditions, while the Pittsburgh district remained under the United Mine Workers scale that had been signed to run for the two years to April 1, 1922.

Demand for coal in 1921 was much below normal, and the general market was supplied almost wholly by the nearby open-shop fields. The Pittsburgh district operators were unable, in general, to compete. Such production as occurred was chiefly due to special conditions. The district produced coal in 1921 equal to about 25 per cent of its capacity, while the Connellsville region and the open-shop parts of West Virginia probably averaged more than a 75 per cent operation.

Many mines of the Pittsburgh district are owned by consumers, chiefly steel interests, but even these mines had a light production, partly because the steel industry was operating at a low rate and required much less than its normal tonnage of coal. There was sale for a fair-sized tonnage of Pittsburgh gas coal despite the fact that gas coal from elsewhere was obtainable at much lower prices. The Pittsburgh product is superior. A moderate amount of domestic coal also was produced, chiefly for local consumption, buyers preferring this coal on account of their familiarity with it.

Undoubtedly some Pittsburgh district coal was sold at a loss in 1921, but such business did not run into a large tonnage, the sales being chiefly in cases in which the operator found coal on his hands without the expected market.

In the summer, when demand for coal was seasonably light, when the requirements of the steel industry were particularly small and while hardly any



Pittsburgh (Pa.) District

Kansas District

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

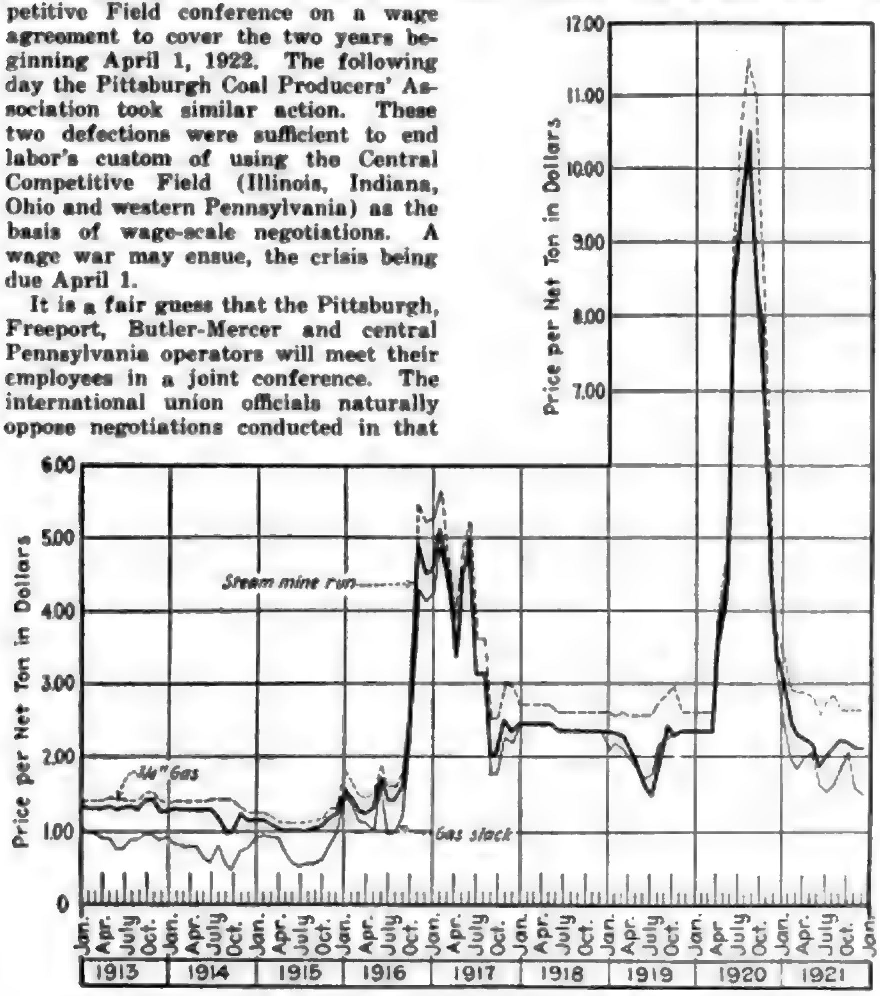
Connellsville coke was being made, Pittsburgh demand was slight. But it was expected that as winter approached and as industrial requirements increased the business would overflow into the union mines. This, however, did not occur. In the last two months of the year Connellsville region operators were having difficulty in selling their output and prices declined.

On Dec. 27 the operators of southern Ohio refused the request of President Lewis of the United Mine Workers that they participate in a Central Competitive Field conference on a wage agreement to cover the two years beginning April 1, 1922. The following day the Pittsburgh Coal Producers' Association took similar action. These two defections were sufficient to end labor's custom of using the Central Competitive Field (Illinois, Indiana, Ohio and western Pennsylvania) as the basis of wage-scale negotiations. A wage war may ensue, the crisis being due April 1.

It is a fair guess that the Pittsburgh, Freeport, Butler-Mercer and central Pennsylvania operators will meet their employees in a joint conference. The international union officials naturally oppose negotiations conducted in that way. The operators of these districts are strongly opposed to the check-off. Besides these two vital issues is the general subject of wage rates and working conditions.

The Pittsburgh district operators feel that wages must go down. While wages in the Connellsville region are not a criterion, because of the difference in mining conditions, it is a commercial fact that the Connellsville region has been largely in control of the market in the general territory tributary, while the Connellsville scale of Sept. 1, 1920, appeared to be in natural relation to the United Mine Workers scale of the Pittsburgh district. At the end of 1921 the so-called "Frick scale" or the Connellsville region was about one-third lower than the scale of Sept. 1, 1920, and while this also is no direct criterion, it furnishes some suggestion of what it would seem reasonable to do with the union scale in Pittsburgh.

The circumstances furnish strong indications that a stiff contest is about to occur. Today the prospect is that coal market conditions in the next three months will be made chiefly by prospects of a union strike April 1. Presumably the public will be disposed to stock coal, but the extent to which this would affect the market cannot be gaged. Certain important interests in the steel industry, having mines of their own, began stocking coal even in December.



SPOT PRICES F.O.B. MINES ON THE PITTSBURGH MARKET OF COAL FROM THE PITTSBURGH DISTRICT

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM PITTSBURGH DISTRICT, BY MONTHS, 1919-1921.

QUOTED ON PITTSBURGH, PA., MARKET

	Lump	Mine Run	Screenings
1919			
January	$2.60	$2.35	$2.10
February	2.55	2.34	2.20
March	2.60	2.30	2.10
April	2.55	2.10	1.85
May	2.55	1.88	1.67
June	2.55	1.61	1.67
July	2.45	1.49	1.70
August	2.58	1.86	2.25
September	2.34	2.43	2.31
October	2.82	2.30	2.48
November	2.60	2.35	2.25
December	2.60	2.35	2.35
1920			
January	2.60	2.35	2.10
February	2.60	2.35	2.35
March	2.60	2.35	2.35
April	4.00	3.81	3.50
May	4.66	4.41	4.15
June	9.00	8.50	7.75
July	10.62	9.87	9.62
August	11.50	10.62	10.12
September	10.95	8.35	8.50
October	8.88	7.88	7.10
November	5.00	4.60	5.20
December	3.73	3.55	3.35
1921			
January	3.40	3.07	2.50
February	2.91	2.44	1.99
March	2.88	2.30	1.84
April	2.88	2.25	2.00
May	2.81	2.19	2.08
June	2.58	1.88	1.61
July	2.79	2.01	1.54
August	2.84	2.14	1.63
September	2.65	2.23	1.87
October	2.63	2.21	2.08
November	2.65	2.15	1.58
December	2.65	2.15	1.50

Wage Readjustment Outstanding Development Of 1921 in Connellsville Region

Confusion of Wage Scales of Frick Company and Independents Incidental to Settlement—Report of End of Beehive Ovens Proves Premature—Trade Returning to Normal

By L. U. Leslie

DURING the year 1921 the coal and coke industry in the Connellsville region traveled an uncharted course and at the opening of the 1922 season there is still no indication that the industry has reached that stage in its readjustment where developments may be analyzed in the normal way by operators and selling agencies in planning for the future.

The last year opened with the collapse of the inflated market, due, most authorities claim, to the unauthorized railroad strike early in the summer of 1920 and to the panicky talk of a coal famine. From a level of $13 for anything that could be marketed under the name of coal, the market dropped and dropped and demand fell off until coal became a drug on the market. The bottom was reached so quickly that a huge tonnage was left on sidetracks, and that surplus added greatly to the confusion.

In the final analysis 1921 was a year of uncertainty. Regardless of other reasons, consumers bought sparingly in the hope of still further price reductions, and producers were unwilling to make large sales at the market price, hoping that the market would soon assume an upward trend.

One of the greatest developments of the year was the wage readjustment, which, however, was not accomplished without some confusion of wage scales of the H. C. Frick Coke Co. and the independent operators. When the year opened the Frick scale of September, 1920, was still in effect. Pick mining, the basis of the scale, carried a rate of $3.24 per 100 bushels. When the atmosphere cleared in the wage readjustment the rate was $2.38 per 100 bushels.

The opening wedge in wage reductions was made March 8 by W. J. Rainey, Inc., when a scale of $2.66 per 100 bushels of coal mined, with other rates reduced proportionately, was posted. That was followed on April 1 by a general wage reduction at all independent operations, the Frick scale of Nov. 10, 1917, being adopted, which further reduced coal mining to $2.29 per 100 bushels.

The first action of the Frick company in adjusting labor costs was taken May 16. That scale, which was not as low as that already in effect by the independent operators, paid $2.65 per 100 bushels for coal. The independents on July 1 further reduced the rate to $2.06 per 100 bushels and on Aug. 1 the Frick company made another cut to $2.38 per 100 bushels.

Throughout the period of wage reductions the scale of the Frick company was always higher than that of the independent operators and was accepted without outspoken complaint by the workmen until late in August, when the W. J. Rainey posted an additional reduction of 10 per cent from the July 1 scale. That brought the situation to a head and the walk-out of Rainey workmen was soon followed by the workers of other independent operators. Their demand was for the Aug. 1 scale of the Frick company, and after a strike of a month's duration in which there was no disorder the independent operators individually granted the demand and the wage question assumed a stable basis.

One of the most significant developments of the year was the blowing out on April 1 of all beehive ovens by the H. C. Frick Coke Co. That action was heralded by many authorities as the end of the beehive ovens, the contention being that the later byproduct oven had been adopted by the Corporation. Their surmise, however, proved unfounded when, early in the autumn, beehive ovens were relighted at many plants, and the assumption now is that the process will be continued steadily until the majority of the ovens are again on the active list. While the beehive ovens were not burning the Frick company shipped huge quantities of coal to the Corporation's byproduct plants, and that gave rise to the report that beehive ovens had been abandoned.

As the year 1922 opens there is every indication that the coal trade is slowly getting back to a normal basis and that the coming year will be far more successful than that just past. There is nothing to become enthusiastic about, however, and operators will move just as cautiously as heretofore. The present freight rates undoubtedly are the principal deterring factor to buying and there is no disputing the fact that until rates are lowered consumers will buy from hand to mouth.

The possibility of a strike in the union districts when the present wage contract expires March 31 will react favorably to this unorganized region in the placing of contracts during the first three months of the year. Consumers cannot be blamed for looking favorably toward an unorganized region where there is little possibility of delivery being interrupted by labor troubles.

Dark Year in Central Pennsylvania Presages Early Radical Change in Union Conditions

Total 1921 Production Barely 39,000,000 Tons—Union Mines Employing 40,000 Men Lose 7,000,000 Tons Business—Non-Union Properties Back to Normal—Outlook Gloomy but Has Possibilites

By D. E. Sell

THE central Pennsylvania bituminous coal field has just passed through one of the most trying years in the history of soft-coal mining. The outlook for the year 1922 is anything but promising and miners and operators are suffering alike.

Operators are facing losses in contracts and miners are losing enormous sums in wages, causing much hardship and suffering, while both see the business that should be theirs going to other fields that have much less natural advantage both from the standpoint of producing and marketing.

The normal market for central Pennsylvania is the vast industrial centers in the New England states, in New York and Philadelphia. For many years these big markets were undisturbed from other fields by reason of the longer haul or the necessity of transferring from cars to ships and then again from ships to cars for delivery.

This avenue of trade is being gradually contracted due to the selling of non-union mined coal from the vast fields of West Virginia and Maryland, where the cost of production and the additional cost of haulage still allows the operators to sell coal at less than the cost of production in this field under union scales.

Unless the officials of the United Mine Workers of America take action at once to reduce the labor cost of producing coal here, the operators say they will be forced to reduce their labor cost to meet keen competition forced upon them by the economic conditions in the adjoining non-union fields.

Central Pennsylvania coal fields are all within easy reach of through lines of transportation. The great coal beds of Somerset County are all reached either by the Baltimore & Ohio R.R. or by short lines to the main line of the Pennsylvania R.R.

The best mining section of Cambria County is traversed by the main line of the Pennsylvania R.R., while all other fields are reached by branches. The Broad Top and Robertsdale fields are within easy reach of the main line and the facilities for shipping coal from the Clearfield section are exceptionally good. With these advantages, the central Pennsylvania field should be enjoying a period of prosperity heretofore unequalled.

During the war, or rather in 1918,

when the advantages of transportation priorities for shipment were accorded this field, the production was approximately 61,000,000 tons. During the year 1920, when the field enjoyed a maximum demand without the benefits of priority, approximately 58,000,000 tons were mined.

The year 1921 ended with a production of approximately 39,000,000 tons, which is less than the production in 1908, when the field was not so fully developed and not so well equipped and when the demand was low.

In 1900 the central Pennsylvania field yielded 14 per cent. of the country's total production of bituminous coal. In 1921, with all the additional advantages and nothing to hinder a maximum production but the influence of union leadership, the field has produced but 9 per cent.

Central Pennsylvania employs 66,000 men in the production of coal. Of these, 40,000 are members of the United Mine Workers of America. Careful tabulations made from the monthly reports submitted to the Central Pennsylvania Coal Producers' association show that during the year just ended the production from the non-union mines, employing approximately 26,000 men, was normal considering the existing economic conditions, while the union mines lost 7,000,000 tons of business.

The labor cost in this field is $2.10 per ton. A loss of 7,000,000 tons in business means a loss to the wage earners of $14,700,000 for the year, or $367.50 for every union miner. Operators on their part suffer not only in lost business but by inability to renew expired contracts.

Production cost in this field is about $3 per ton, f.o.b. at mines. This does not include any allowance for the earnings of capital or interest on investment. Probably ninety-nine out of each hundred operators who mined coal during the closing month of the year under the union scale lost money. Few union operators other than those producing railroad coal will be able to show a profit for the year.

Coal from adjoining fields where adjustments of wages have been made is freely offered in the normal markets of central Pennsylvania at $2 per ton.

Railroad contracts made when the normal price ranged from $3 to $4 have practically all expired and mines in the Johnstown district furnishing locomotive power have been obliged to close down because railroads refuse to consider bids above $1.75. This price is met in non-union districts and the railroads are drawing their fuel supply from these mines.

Several large coal-consuming corporations that own mines produced their own fuel at minimum cost. Among these were the Penn Central Light & Power Co., in Altoona, and the Penn Public Service Corporation in Seward.

Union mines in operation are collecting the check-off, under a system that was the subject of several court decrees during the close of the year, but these same operators have refused to collect an additional $1 per month for three months as an assessment placed by the United Mine Workers of America to replenish their treasury.

Operators, led by T. H. Watkins, president of the Pennsylvania Coal & Coke Corporation, practically ended negotiations with the United Mine Workers of America through their president in District No. 2, when that official threatened to use whatever force was necessary to compel compliance with union demands. The outcome is doubtful.

In spite of their harassments operators are still hopeful for the new year. They appear to face ruin whether they operate or not, but strong measures may be taken to get mining in this field on a sane economic level, thus bringing back to central Pennsylvania normal business and prosperity.

Coal Market of Cincinnati in 1921 Ranged from Hopefulness to "Each for Himself"

Prospective Process of Elimination Likely to Result in Survival of Fittest—Probably Will Be Difficult to Write Contracts—Industrial Revival Would Result in Discomfiture of Cautious Buyers

By H. W. Coates

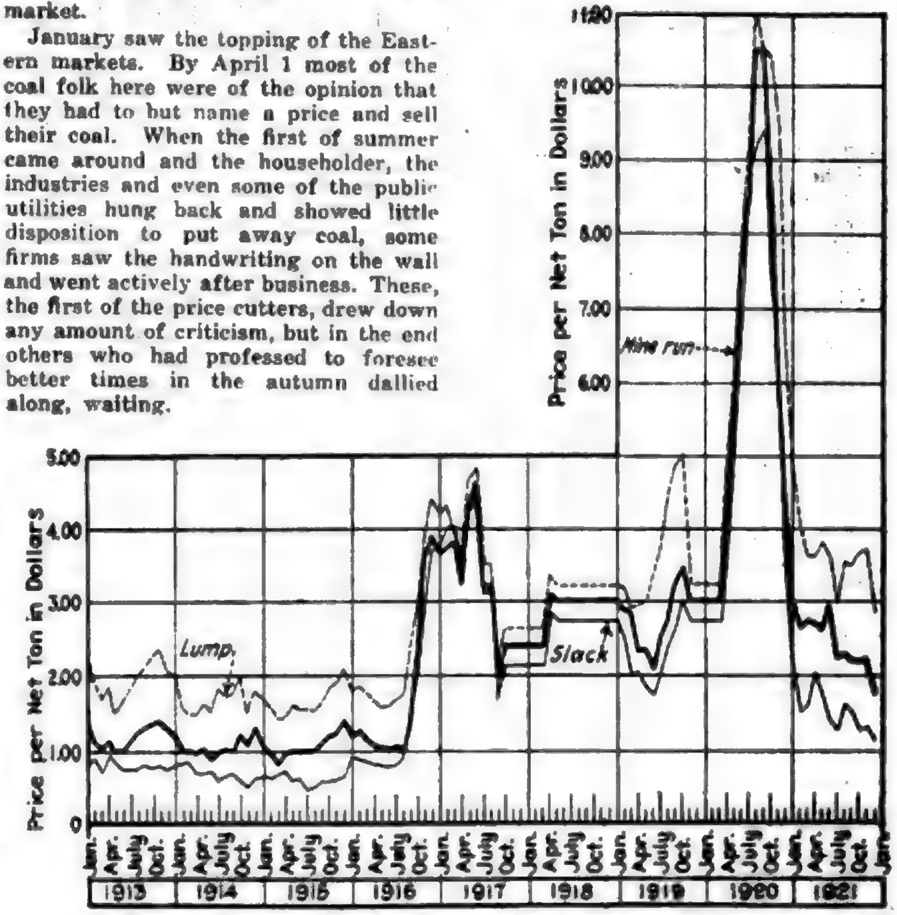
"WHATEVER goes up must come down." This truism of kidhood days aptly applies in summing up the gyrations and flops of the coal market as viewed from the vista of the Cincinnati gateway. The first half of the year might be classified as a "hope deferred" period and the latter six months was of a brand that might be defined as "the devil take the hindmost."

All the coals have moved from high to low in the year. With some the trend was felt earlier than with others. Summing all things up, overproduction was the greatest influence on the market.

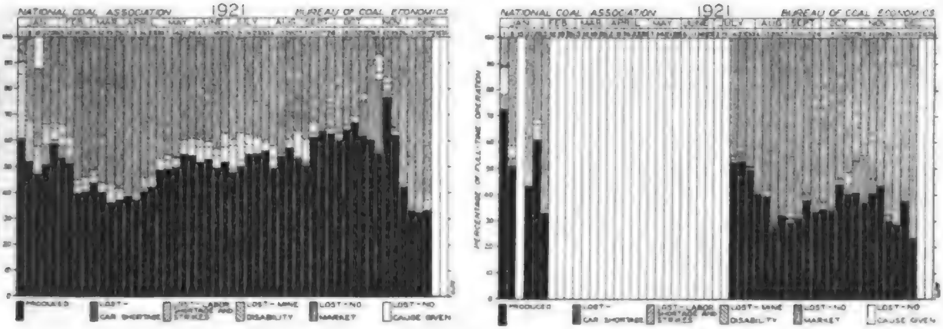
January saw the topping of the Eastern markets. By April 1 most of the coal folk here were of the opinion that they had to but name a price and sell their coal. When the first of summer came around and the householder, the industries and even some of the public utilities hung back and showed little disposition to put away coal, some firms saw the handwriting on the wall and went actively after business. These, the first of the price cutters, drew down any amount of criticism, but in the end others who had professed to foresee better times in the autumn dallied along, waiting.

Midsummer marked an absence of orders from the Lake. Shipments did not stop, but for the first time in a half dozen years the Lake buyer played little or no part in the swing of prices on this initial market.

Then came the unkindest cut of all. First the chance of a railway strike, then a possibility of foolishness on the part of the miners because of the famous Anderson decision. The mines burdened the sidings, sent coal to the scales with a profligate hand, presupposing that this was the time when things would tighten up. Instead all



SPOT PRICES F.O.B. MINES ON THE LOUISVILLE MARKET OF COAL FROM SOUTHEASTERN KENTUCKY



Harlan District, Kentucky

Southern Appalachian Field

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

chances of holding prices in check were ruined and even smokeless coal—which so far had held its own—went to pot.

Although there are coals from nine fields that figure on the Cincinnati market these can be generally lumped in three divisions, viz: smokeless, southeastern Kentucky and West Virginia high volatile. New River and Pocahontas prepared sizes started the year off around $6 with slight concessions in February that reduced the price to $5.50. Contracts written in April were mostly made on a $5 basis, which obtained until October, when overproduction made the market top heavy and the spot price at one time ran as low as $4. Even with that there was a rally and early in December spot sales were down to $2.75. Mine-run weakened earlier. A year ago it was worth $5 a ton. Contracts were made in April at $3.50. September saw it skidding, with contract prices reduced to $3; in November to $2.50 and the spot market in December, $1.65@$2. Slack contracts were made around $3 but by midsummer it was hanging on the ropes, some firms taking as low as $1.75, and from that it has gravitated to $1.25 a ton.

Southeastern Kentucky block started off at $4.50 but by April the operators were willing to sacrifice slack to hold up the block and lump. Until early in November this held good, with prices $3.25@$3.75. Some sales since were made at $2.75 and a trifle lower. Mine run went from $3 down to $1.50 and slack started off at $3 and has sold as low as 75c., with some in distress hitting a lower mark.

With coals of all kinds, grades and classifications in what might be generally termed West Virginia bituminous, all manner of prices could be heard. Choice coals, blocky splints from Cabin Creek and Island Creek started out with a $3.75 figure and have since sold down to $2.50. Most of the West Virginia operators were disposed to meet certain freight differentials by lowering the domestic price and raising that of slack in order to equalize the gross returns. This made the average price of slack about 15c. to 35c. higher than Kentucky quotations.

There are few sections of the country where competition between union and non-union fields plays such a part as at the Cincinnati gateway. All through the year the inroads that have been made by the untrammeled fields of southeastern Kentucky and the non-union fields in West Virginia have been a particularly sore point. Reductions in wages in the non-union fields when prices slipped were only the forerunners of further price cuts. It is safe to say that the fields in Southeastern Kentucky and those of West Virginia that have been forced into union agreements never felt the brunt of giving in to a greater extent than they have in the past six months, and the truth of this will be borne out at a later date, when the wage agreements come up for consideration.

As outlined above, there were two distinct phases of the market. The first six months favored those who determined to hold to a selling policy of given prices. Sales slips of some of these companies will show that the price they set in April could be had in September—even though other firms were making deep concessions. Once prices started going to smash apparently everything went overboard, and since an accumulation had to be faced—well, it simply couldn't be done. And there is no better illustration of this than the situation faced by the smokeless people, where even the biggest companies voluntarily had to reduce contract prices in order to hold their trade. In southeastern Kentucky a peculiar condition obtained. Here one large selling corporation with an unlimited supply to draw from took the low-priced method of assuring tonnage as early as last May. This company broadcasted its prices over a dozen states and cut a bigger swath than its officials imagine in breaking the market—not once but a dozen times.

Because of the industrial situation the center of interest developed about the movement of domestic coals. Smokeless naturally had the center of the stage. Here a somewhat different situation than in normal years—and by that conditions of a half dozen years ago is meant—in that Pocahontas, always a favorite on this market has come back in the spotlight. Perhaps this is largely due to the fact that New River has been flirting so long with the East that she finds it rather hard to return to old loves in the West. Logan County is giving Kanawha a battle and Hazard and Elkhorn are not to be denied their fair share of the patronage.

Of all the customers of the Cincinnati market there has been only one that has come up to past performances. Early in the year industries floundered around, undecided as to what they should do or even as to the volume of their requirements. Utilities, usually disposed to contract, went warily; railroads went into the open market and some of them have not even been coaxed away from the "bargain counter," but there has been one line of trade that took 100 per cent—the paper industry—and if one considers that these are plentifully dotted "up the valley" from here to Dayton and beyond it can be

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM SOUTHEASTERN KENTUCKY, BY MONTHS, 1919-1921

QUOTED ON LOUISVILLE, KY., MARKET

	Lump	Mine Run	Screenings
1919			
Jan.	3.25	3.00	2.75
Feb.	3.20	2.90	2.50
Mar.	2.93	2.85	2.00
Apr.	2.95	2.35	2.05
May	3.00	2.35	1.85
June	3.40	2.10	1.75
July	3.70	2.54	2.05
Aug.	4.45	2.73	2.37
Sept.	4.88	3.25	2.63
Oct.	5.00	3.50	3.00
Nov.	3.25	3.00	2.75
Dec.	3.25	3.00	2.75
1920			
Jan.	3.25	3.00	2.75
Feb.	3.25	3.00	2.75
Mar.	3.25	3.00	2.75
Apr.	4.82	4.38	3.67
May	6.00	5.75	5.00
June	7.60	7.60	6.69
July	9.12	8.57	8.75
Aug.	11.00	10.50	9.25
Sept.	10.50	10.50	9.38
Oct.	10.37	7.50	8.38
Nov.	9.50	6.38	6.45
Dec.	6.55	4.36	3.75
1921			
Jan.	5.00	3.00	2.25
Feb.	4.07	2.65	1.52
Mar.	3.66	2.73	1.60
Apr.	3.65	2.70	2.03
May	3.82	2.63	1.75
June	3.66	2.99	1.40
July	2.96	2.25	1.28
Aug.	3.58	2.30	1.60
Sept.	3.55	2.22	1.52
Oct.	3.70	2.20	1.28
Nov.	3.82	2.22	1.30
Dec.	2.85	1.78	1.13

seen that this a point worthy of consideration.

One other element has entered into the trend of trade; it is like the bug under the chip—it can't be seen unless one goes hunting for it—taxes. The banks held up many a coal firm for the first two quarterly payments, and then more cars were turned on the spot market than usual to get cash to meet the December payments.

And that brings the situation to the place where it must be looked squarely in the face. There are some coal men in Cincinnati who are honest enough to say that they believe that there will be great changes in the coal map in the next twelve-month. Mines cannot go along pouring out coal at a loss. Someone has got to stop. It is unpleasant to say it, but a few failures may be the result. There are mines closed right now that may not open again for quite some time. Something has to be done to put a stopper on overproduction. It is an unpleasant thing to talk of throat-cutting, but that is what is going on now. Just how deep the slashes can be made until they hurt coal men do not know, nor do they propose to speculate. They believe too that the middleman is due to get "his"—that is, there will be a process of elimination and there will be a survival of the fittest.

All this will have its effect upon the price of coal. As long as the eternal struggle continues to keep the mines going—with little thought of the inevitable—the spot market will have but one level. Contracts, many believe, will be difficult to write next April. The buyers having waded in low prices, having been masters of the situation, will stand back. In the event of an industrial upturn they will get their figures burned. No one ventures to talk of the April basis at this time. Things happen too suddenly to venture opinions. "But," said one of the best-informed men in the local trade, "we are talking about the 1917 wage scale. There are some who talk of the 1916 wage scale. I can remember when we thought $1.25 a ton for prepared Kanawha as a pretty good price and $1 for run-of-mines with 85c. for slack was nothing to be sneered at."

Closing with a rush in a few of the makes of coal that were peurile efforts compared with some of the rallies of the few preceding years the year 1921 passes into coal history, so far as the Cincinnati market is concerned, as one in which all precedents were broken and everything that was figured to "follow form" turned right around and did the opposite to what the trade was accustomed.

The closing month was one in which the producing companies finally lost faith in the market and a greater number of mines stood idle in the territories using the Cincinnati gateway than at any time since 1913. There was a little flurry of inquiry for slack that sent the price upward, and the smokeless operators were able to stave off for a while the completion of the decline in that coal—but that was all.

Alabama Suffers Worst Year in History

Substantial Cuts Prove That Lack of Demand, Not High Prices Were Responsible for Flatness of Commercial Coal Market—No Labor Trouble—State Ready for Maximum Production

By H. B. McLaurine
Birmingham, Ala.

DEVELOPMENTS in the coal trade during 1921 were in every respect the most disappointing of any year in the history of the industry in Alabama. Many factors contributed to this situation and kept both the marketing and producing ends of the industry in a state of suspense and uncertainty.

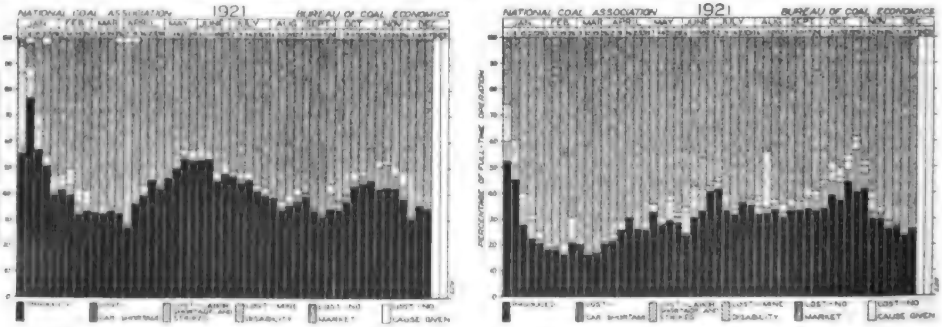
With the passing of the usual lull of the holiday season in January, 1921, a fair demand for commercial coal was expected, but in vain. Only a weak spot demand developed. Industry generally was in a chaotic state and so was coal buying. Stocks accumulated prior to the holidays were not entirely exhausted for some weeks.

Demand during the second quarter was practically confined to the spot market, and contracting was limited in a more marked degree than before. Outside of agreements executed with the railroads and other utilities and a few industrial contracts, consumers generally pursued the hand-to-mouth policy of buying. This continued throughout the year. November and December were especially dull and demand was at the lowest ebb in years. Rail requirements as stipulated in contracts placed minimum limits lower than usual and the movement against these contracts as well as others, was held at the lowest notch—in fact less tonnage was taken at times than the minimum allowed.

Maritime business as well as the railroads suffered for lack of freight and ship sailings accordingly were handicapped, but there was a fair demand for bunker coal through the ports of Mobile, Pensacola and New Orleans, and some bunker fuel shipments were made to Galveston during the latter part of the year. Indications are that the market at the latter port will afford an outlet for a much larger tonnage during 1922. Export coal moved in limited quantities to Central and South American points and Cuban territory.

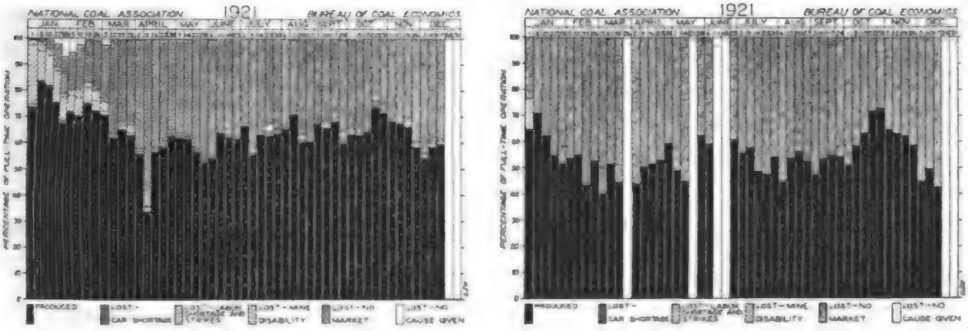
Although the banks restricted credits sharply, this was not the reason consuming interests did not stock. They were unable to visualize their own future needs for one thing, and for another, they hoped for a change in coal if freight rates dropped.

Quotations on commercial coal f.o.b. mines were at peak at the beginning of the year and only slight reductions were gradually effected in the first quarter. Between March and July wage adjustments were made at some of the furnace company mines and at a few commercial and domestic operations, and a general reduction was effective at practically all mines July 1. These adjustments, brought about by mutual agreements with employees, were made in an effort to vitalize the trade. They failed utterly. This



Kenova-Thacker District, W. Va. Northeastern Kentucky

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES



Alabama

Virginia

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

proved anew that the dullness in the trade was attributable solely to lack of need for the product.

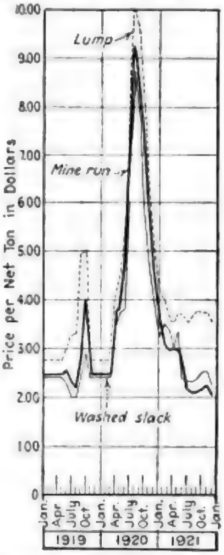
Although the market was consistently dull and featureless practically the entire year, prices were without violent fluctuations. Production was held nearer the mark of trade requirements by all the larger producers than during previous periods of depression and there was less "distress" coal than formerly. The policy of booking the business and mining the coal later was more consistently followed. There was some underselling, but the volume of trade offering was at no time large and the tonnage disposed of at shaded figures had little bearing on the market. There was no competition between union and non-union producers, as the Alabama field is on the open-shop basis, only a few small operations having union agreements.

The range of quotations on mine-run and prepared coal during the year is shown in the accompanying table of prices in January, April, July and December.

During the first three months of the year there was a good demand for all grades of domestic coal and the output was disposed of without difficulty—in fact a shortage was imminent in January—but during February and March the weather became very unseasonable and demand eased off. Production also decreased, due to the sluggish steam market, about 70 per cent of the domestic coal coming from the commercial mines normally, and the slackened demand was just about sufficient to absorb the tonnage produced from both sources during the quarter. The output was sufficient also to be easily absorbed in the process of stocking from April through September. However, by this time dealers had accumulated about all the coal they could handle and were compelled either to cancel contracts or restrict deliveries, which practically paralyzed the wholesale trade.

Householders had, as a rule, failed to place orders for winter supply during the spring and summer and retailers had been unable to pass any appreciable amount of their stock on to the consumer. This condition was attributable to several causes. There was a lack of funds in the hands of the rank and file to purchase coal in quantities due to the long period of unemployment. The casual householder who had the money neglected to have his coal stored. Then again innumerable wagon mines located in the vicinity of Birmingham, with little overhead expense, no yards to maintain along with an expensive delivery system, and with other advantages, were enabled to supply hundreds of families with winter coal at a figure which could not be met by local dealers. This coal, while in many instances of inferior quality, nevertheless was cheaper and displaced many orders which would otherwise have gone to the retail yards and greatly reduced their stocks, and likewise afforded relief in the wholesale market.

With the approach of the autumn and winter months it was confidently expected that seasonable weather conditions would prevail, which would force a more active retail market, but aside from a few days of low temperature the days have been balmy and springlike to date, and November and December joined the steam market in the most acute stagnation that has ever



SPOT PRICES F.O.B. MINES ON THE BIRMINGHAM MARKET OF COAL FROM ALABAMA FIELDS

TABLE I.—RANGE OF QUOTATIONS ON STEAM COAL DURING 1921

Grade Coal	January		April		July		December	
	Mine-Run	Washed	Mine-Run	Washed	Mine-Run	Washed	Mine-Run	Washed
Big Seam	$2.85@$3.25	$3.20@$3.50	$2.50@$3.00	$3.00@$3.25	$2.00@$2.25	$2.25@$2.45	$1.90@$2.30	$2.00@$2.30
Carbon Hill	3.15@ 3.50	3.35@ 3.50	2.50@ 3.15	3.25@ 3.35	2.00@ 2.75	2.65@ 2.75	1.90@ 2.25	2.50@ 2.85
Cahaba	3.75@ 4.25	4.00@ 4.50	3.00@ 3.25	3.25@ 3.50	2.85@ 3.25	3.00@ 3.25	2.25@ 2.75	2.50@ 3.15
Black Creek	3.75@ 4.25	4.00@ 4.50	3.00@ 3.25	3.25@ 3.50	2.75@ 3.00	3.00@ 3.45	2.50@ 2.75	2.50@ 3.00
Corona	3.35@ 3.50	4.00@ 4.50	2.50@ 2.75	3.50@ 4.00	2.50@ 2.75	3.50@ 4.00	2.25@ 2.50	2.75@ 3.00
Pratt	3.35@ 3.50	....	2.75@ 3.00	....	2.50@ 2.75	....	2.25@ 2.50	....

TABLE II.—RANGE OF QUOTATIONS ON DOMESTIC GRADES DURING 1921

Grade of Coal	January Lump and Nut	April Lump and Nut	September Lump and Nut	December Lump and Nut
Big Seam	$4.00@$5.00	$3.00	$3.25@$4.25	$2.75@$4.00
Carbon Hill	4.50@ 5.50	3.50	4.25@ 4.35	4.00@ 4.25
Cahaba	5.00@ 7.00	4.50@ 5.50	4.90@ 7.25	4.50@ 5.50
Black Creek	5.00@ 7.00	4.50@ 5.50	5.50@ 6.00	4.50@ 5.00
Corona	5.00@ 7.00	5.00	4.75	4.00@ 5.00
Montevallo	8.00@ 9.00	6.00	6.50@ 7.2	6.00@ 7.50

existed in this section. About the middle of December retail dealers in the Birmingham district reduced prices on the principal grades of domestic coal from $1 to $1.50 per ton in an effort to stimulate buying, but as the weather continued unseasonable the price concession was of little avail. Quotations f.o.b. mines during the year are given in the subjoined table on domestic grades.

Although no official figures will be available for some months, from the most accurate data that can be gathered it is estimated that production for 1921 will scarcely total more than 12,000,000 net tons, the lowest since 1908, when 11,523,299 tons were mined, and a loss of approximately 5,000,000 tons as compared with 1920, which had a total output of 17,391,437 tons. This unfavorable showing is due to the dull commercial and domestic market and also in a large measure to idleness in the iron-making industry, which attained the lowest production stage in years, thus eliminating a large tonnage of coal which would have gone into coke manufacture. Production for the second week in December totaled 220,000 tons as compared with about 341,000 for the second week in January. The resumption of iron making during the latter half of the year afforded immeasurable relief to mine workers of the district, but nevertheless there has been much privation and suffering due to unemployment.

While the trade is not very optimistic over the outlook for 1922, it is the general belief that industrial conditions will show a measure of improvement which will call for a greater coal consumption. The facilities for producing a maximum market demand are available. Alabama is now on an open-shop labor basis more securely than at any time in the past, and there is no likelihood of labor trouble to interrupt the harmonious relations that exist between employer and employee. Mine workers in the Alabama district have but one demand: more work.

Several major developments were begun during the year. Principal of these are the new Overton mine of the Alabama Fuel & Iron Co., which is modernly equipped and is being developed for large capacity; electrification of the Bessie and Flat Top mines of the Sloss-Sheffield Steel & Iron Co.; addition of storage bins and equipment for the preparation of coal at the Sterling mine of the Munro-Warrior Coal Co., and opening of the Burnwell Coal Mining Co. property near Burnwell in Walker County, which will be equipped throughout with electrically-driven machinery of the latest design.

The completion of the federal coal terminals at Mobile at a cost of $400,000 is near at hand and will provide extensive facilities for the handling and storage of bunker coal and greatly aid in the rapid coaling of ships at that port, which handles considerable Alabama coal.

West Virginia Must Sell Smokeless Coal Abroad

Experience of 1921 Shows Home Market Unreliable—Efforts to Cut Freight and Ocean Rates Fail—Wages Drop One-Third in Some Fields—U. M. W. Grip Weakens

By J. W. Weir

DEVELOPMENTS during 1921 in the smokeless coal industry of West Virginia established beyond all doubt the fact that the prosperity of this region is dependent to a great extent upon the volume of export business low-volatile mines are able to get. Transportation and labor questions during the year were more at the fore than they have been since before the war.

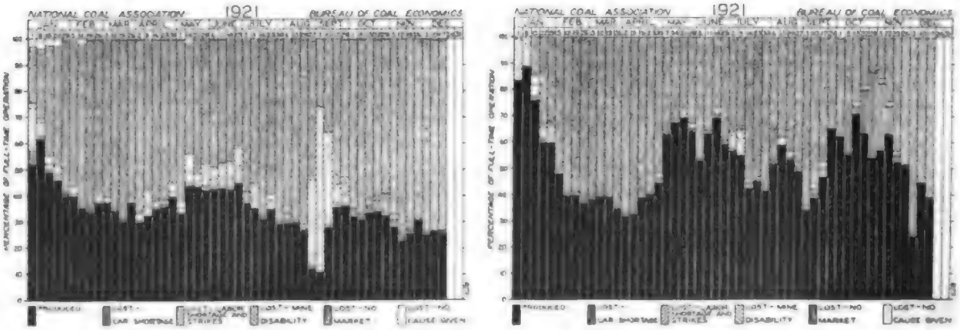
Although production in smokeless territory during 1921 appeared to be far below that for 1920, chiefly because of a lack of export business, statistics covering the tonnage mined in the yearly period show that in some fields at least 1921 production was only about 10 per cent less than the 1920 mark. The unorganized portion of the smokeless area did better than the organized section, where higher labor cost prevailed.

During only three months of the year smokeless mines got foreign business worth mentioning and then only because of the British coal strike. Fluctuations in production were common. Sharp increases were always due to extraordinary causes.

Beginning about the middle of December, 1920, producers began to suffer a general curtailment of export business. Although that cut down production, output was fair during the first two months of the year. But by March as the export demand began to wane and as foreign competition became keener there was a marked drop in production. It continued until the British miners struck. As soon as the strike was settled, the output began to decline once again until late in September, when a railroad strike appeared to be inevitable. Later the threatened strike among the miners over the check-off decision of Judge Anderson again pushed output. After that the market was fairly glutted with smokeless coal and production sagged to a minimum.

Why do smokeless producers find it so difficult to market their coal abroad? It is here that rates and labor become a vital factor. Early in the year smokeless operators saw that if they were to hold foreign business, there must be an adjustment of transportation rates on coal for export. Operators through the Smokeless Coal Association set about trying to effect a reduction in order to meet growing foreign competition. Repeated efforts to induce tidewater railroads to scale down their rates were futile. The operators then appealed to Herbert Hoover, Secretary of Commerce. As a result negotiations were undertaken. They were still in progress as the year closed. Mr. Hoover suggested a reduction of $1 a ton on coal handled by the railroads for export.

It appears to have dawned upon gov-



Kanawha District

Pocahontas District

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

PRODUCTION OF COAL IN THE POCAHONTAS DISTRICT

(From U. S. Geological Survey for the Year 1921)

	Tons Lost on Account of—					Production	
	Cars	Labor	Mine	No Market	Total	Coal	Coke
Total for 1921	634,454	211,978	310,963	10,802,335	11,959,730	13,089,029	109,716
Percentage	2.5	0.9	1.3	43.0	47.7	52.3	......
Total for 1920	7,248,679	1,258,114	429,969		8,936,762	15,421,288	......
Percentage	29.7	5.2	1.8	...	36.7	63.3	......
Av. wkly. prod. for 1921					251,712 net tons		
Av. wkly. prod. for 1920					294,917 net tons		
Av. daily prod. for 1921					41,952 net tons		
Av. daily prod. for 1920					48,495 net tons		
Average daily rating by Norfolk & Western for 1921						88,220 net tons	
Average daily rating by Norfolk & Western for 1920						81,908 net tons	

COAL & COKE LOADED ON CHESAPEAKE & OHIO R.R., 1921, COMPARED WITH 1920

(In equivalent 50-ton cars)

	Coal		Coke		Coal and Coke	
Month	1921	1920	1921	1920	1921	1920
January	38,692.0	42,870.4	1,007.8	1,193.2	39,699.8	44,063.6
February	25,778.2	37,045.2	802.8	1,224.0	26,581.0	38,269.2
March	30,487.0	46,438.8	511.0	1,190.6	30,998.0	47,629.4
April	37,348.0	38,018.6	524.2	944.8	37,872.2	38,963.4
May	47,580.8	38,960.9	601.2	1,045.2	48,182.0	40,006.1
June	53,280.4	41,939.8	487.4	1,070.4	53,767.8	43,010.2
July	40,049.2	47,638.6	280.0	1,133.0	40,329.2	48,771.6
August	36,930.0	54,493.0	274.6	1,139.8	37,204.6	55,632.8
September	40,107.6	53,048.0	431.6	1,146.6	40,539.2	54,194.6
October	50,669.0	52,258.5	590.4	1,210.2	51,259.4	53,468.7
November	40,218.8	47,761.5	477.6	1,315.0	40,696.4	49,076.5
Total	441,141.0	500,473.3	5,988.6	12,612.8	447,129.6	513,086.1

ernment officials and the public that England can undersell American coal producers right in their own bailiwick.

Ocean rates also need adjustment. Repeated efforts were made throughout the year to solve this problem, but without success. Smokeless producers could not even accept the U. S. Shipping Board offer of boats at $1 a year because the cost of operating vessels under American registry and under American laws is 25 per cent per ton in excess of the cost of operating vessels of foreign registry.

During the latter part of the year the wage question became more and more important in smokeless territory, especially in the field where miners were organized. This problem was solved without much difficulty in non-union fields, where the decline in prices was met by lowering of wages. In organized territory reductions were steadfastly opposed by officials of the United Mine Workers notwithstanding the fact that operators were unable to mine coal at prevailing prices. In taking such a position the officials seemed to weaken their organization because during the last two months of the year, after mines had been idle awhile, miners made overtures to the operators for a reduction, if that would give them work. Resumptions of mining were all on an open-shop basis. By the end of the year defections from the United Mine Workers organization had become large.

The revision of the wage scale was somewhat general. The reduction was as much as 33 per cent in some fields. Coal which had brought $4.50 per net ton at the mines on Jan. 1, 1921, was selling during the latter part of December at less than $2 a ton, a decrease in price of more than 50 per cent, as against a reduction in wages of only about 33⅓ per cent in non-union territory.

Non-union smokeless fields were singularly free from labor disturbances in 1921. In the Pocahontas territory non-union contracts between operators and employees were still in force and during the year the injunction restraining organizers from interfering with such contracts was made permanent. With that injunction in force no further effort was made during 1921 to organize any of the non-union mines along the Norfolk & Western either in the Pocahontas or Tug River field.

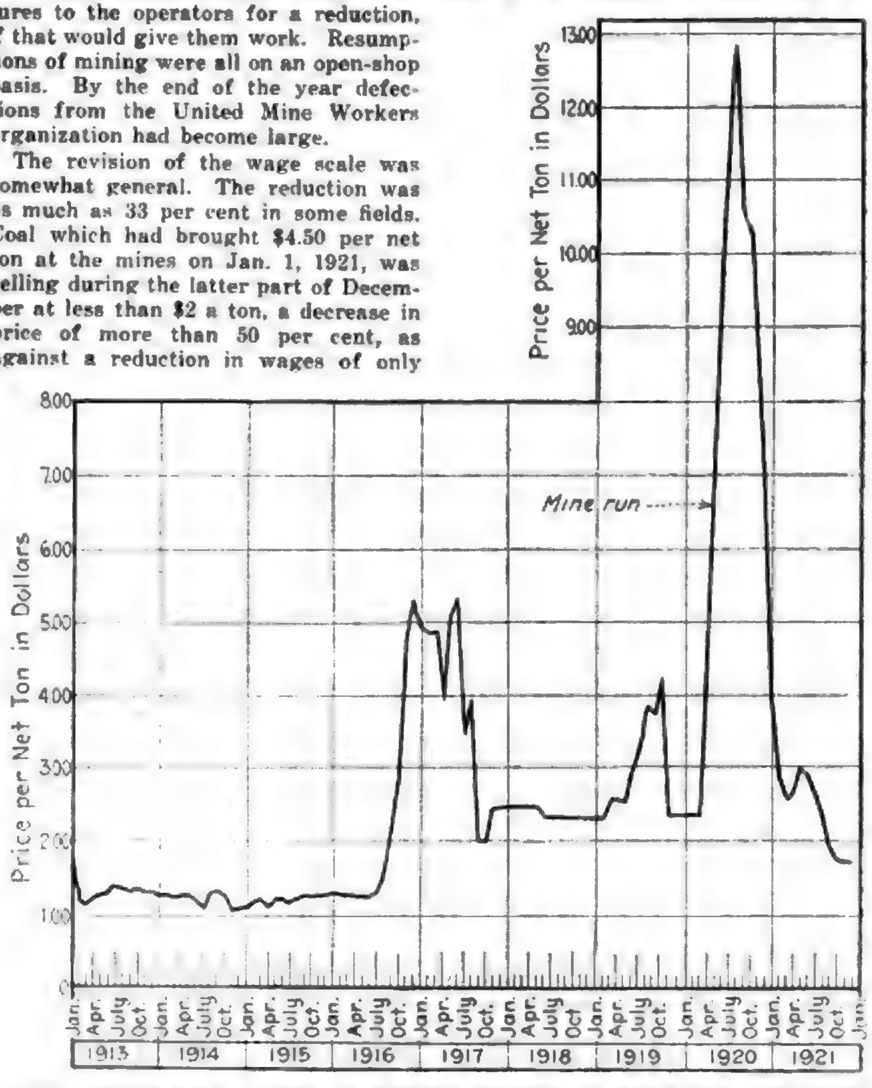
There was some trouble during January and February on the Virginian Ry. when union miners kept up a campaign of violence against one open-shop company on Willis Branch until it closed down after part of the equipment had been destroyed and miners driven from their homes. Some of the New River miners also participated in the armed march against Logan County late in August and during the early part of September.

It so happened that at a time when there was the least demand for smokeless coal the potential tonnage of the smokeless area was materially increased. Opening of the Greenbrier field in the vicinity of Quinwood and

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM STANDARD FIELD OF ILLINOIS, BY MONTHS, 1919-1921.

QUOTED ON ST. LOUIS, MO., MARKET

	Lump	Mine Run	Screenings
1919			
January	$2.55	$2.35	$2.05
February	1.87	1.92	1.60
March	1.95	1.67	1.03
April	2.08	2.00	1.75
May	1.93	1.66	1.33
June	1.[illegible]	1.68	1.43
July	1.88	1.[illegible]	1.43
August	2.40	1.91	1.[illegible]
September	2.69	2.33	2.03
October	2.98	2.38	1.88
November	2.55	2.35	2.05
December	2.55	2.35	2.05
1920			
January	2.55	2.35	2.05
February	2.55	2.35	2.05
March	2.55	2.35	2.05
April	3.12	2.80	2.[illegible]
May	4.35	4.00	3.[illegible]
June	4.84	3.50	3.75
July	5.25	5.25	5.25
August	7.25	6.75	7.00
September	7.25	6.25	5.75
October	5.65	5.30	4.25
November	4.63	4.20	3.25
December	3.70	2.22	2.00
1921			
January	3.07	2.25	1.57
February	2.47	1.95	1.25
March	2.59	1.92	1.25
April	2.50	1.90	1.30
May	2.40	1.83	1.50
June	2.18	2.00	.96
July	2.88	1.70	.89
August	2.47	1.76	1.08
September	2.69	1.89	.74
October	3.43	1.73	.59
November	3.25	1.99	.86
December	2.83	1.93	1.16



SPOT PRICES F.O.B. MINES ON BOSTON MARKET OF MINE-RUN COAL FROM SMOKELESS FIELDS OF WEST VIRGINIA the development of coal acreages in Wyoming County were only a part of the development. Only a few years ago producers thought the production of smokeless, amounting then to about 36,000,000 tons a year, had reached its peak. Between the development of new territory and an increase in the capacity of many mines the potential tonnage now is far above that of 1916.

Changes in the ownership of smokeless properties were more numerous than usual during 1921.

As nearly as can be estimated the fifty-six operating companies in the Winding Gulf region produced 5,481,216 net tons of coal during the year 1921. This field produced 5,813,950 net tons of coal during the preceding year, so that after all there was a decrease of only a little more than 300,000 tons, in spite of a poor market. Operators of this field are of the opinion that no further cuts in prices can be made and that carriers must meet the issue of competition by reducing rates. It would take ninety days to accomplish what the trade is looking for. So Winding Gulf operators have concluded that they cannot hope for any lower rates before April 1. In the meantime the mines in the Winding Gulf field are amply equipped and well supplied to produce a maximum tonnage.

There was produced in the Pocahontas field of West Virginia during the year ending December 31, a total of 13,089,029 tons of coal, the production for the last two weeks of the year being estimated. In the same period there was produced 109,716 tons of coke. The output of the field represented 52 per cent of the potential capacity of the Pocahontas mines. Car-shortage losses during the year amounted to only 2.5 per cent, or 634,454 tons, and labor shortage losses amounted to only 211,978 tons. The loss from no market was 43 per cent, or 10,802,335 tons. Whereas there had been no no-market losses during 1920, lack of market was responsible in 1921 for cutting production almost to half.

As Pocahontas mines produced 63.3 per cent of their potential capacity in 1920, there was a decrease in production of only 11 per cent in the face of the fact that there was little market throughout the year. Production for 1920 amounted to 15,421,288 tons. According to the car-distribution reports of the Norfolk & Western the Pocahontas district loaded 51.5 per cent of its rating as against 59.8 per cent for 1920.

Mines in the Tug River region succeeded, it is believed, in producing more coal than during 1920. There were no labor troubles in the Tug River region in 1921, although it adjoins the Williamson field. All the mines in this field are operated on a non-union basis.

The New River district suffered more from general depression in the coal market than any other smokeless district, principally because operators there were not able to reduce their labor costs. Hence during the latter part of the year not more than 20 per cent of the mines operated. A number of companies resumed toward the close of the year, working a day or two a week under what is known as the government wage scale, in effect prior to the new agreement of Sept. 1, 1919. The employees at each of these mines individually and collectively asked to go to work at these rates.

Many operators doubt whether there will be a strike of any consequence in the bituminous coal fields next spring and therefore they believe that business for the first six months of 1922 will be more or less restricted. They do not hope for a general betterment of the coal industry in the smokeless area until they can export part of their tonnage. When land and sea transportation becomes such that British competition can be met, they believe prosperity will again reign in the smokeless fields of West Virginia.

COAL LOADED IN THE POCAHONTAS DISTRICT DURING 1921, COMPARED WITH 1920

	—Net Tons Loaded—		Percentage of Rating Loaded	
	1921	1920	1921	1920
January	1,401,515	1,276,865	68.3	71.5
February	858,165	962,125	45.3	57.8
March	826,595	1,242,305	38.6	62.4
April	794,535	930,860	38.5	45.3
May	1,316,010	994,605	64.1	47.1
June	1,331,560	1,159,410	64.9	51.2
July	1,050,135	1,393,500	46.3	58.7
August	1,154,450	1,353,220	47.8	60.9
September	1,158,905	1,361,585	47.8	60.5
October	1,385,040	1,322,330	56.5	58.7
November	1,197,150	1,384,695	48.9	68.3
December	1,160,000	1,305,515	48.0	64.9
Total	13,634,068	14,687,015	51.5	59.8

(a) December, 1921, is estimated.

Average daily rating for 1921 ..... 68,220 net tons

Average daily rating for 1920 ..... 81,908 net tons

Lower Prices and Freight Rates Needed to Move Coal More Freely in St. Louis Market

Change by Flour Mills from Steam to Gasoline and Electric Power Hurt Coal Industry Last Year—Flurry of Brisk Business During Strike Scare Was Short-Lived

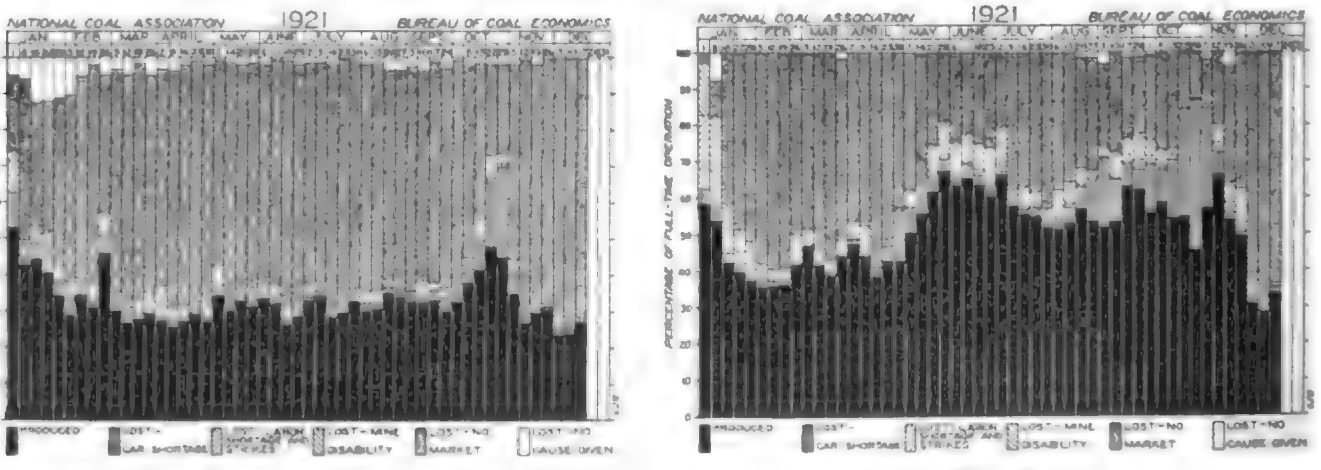
BY E. J. WALLACE

St. Louis, Mo.

UNFAVORABLE conditions clothed the advent of 1921 to the St. Louis trade. As 1920 drew to a close business eased up to such an extent that the nice high retail prices were chopped off effective Jan. 1 in an effort to move fuel. The domestic user, having become panic stricken in the autumn of 1920 bought more than he needed, so the demand was light and easy when the curtain went down on 1920 and it was but a forerunner of what 1921 was to be, but no one knew it.

The situation in the country was somewhat similiar only that domestic coal had been short, and dealers, not having a chance to store, were buying a little as they needed it. Flour mills were changing from steam to gasoline and electric power. Some were putting in oil burners and many were idle. Wood was used at many points because it was cheaper.

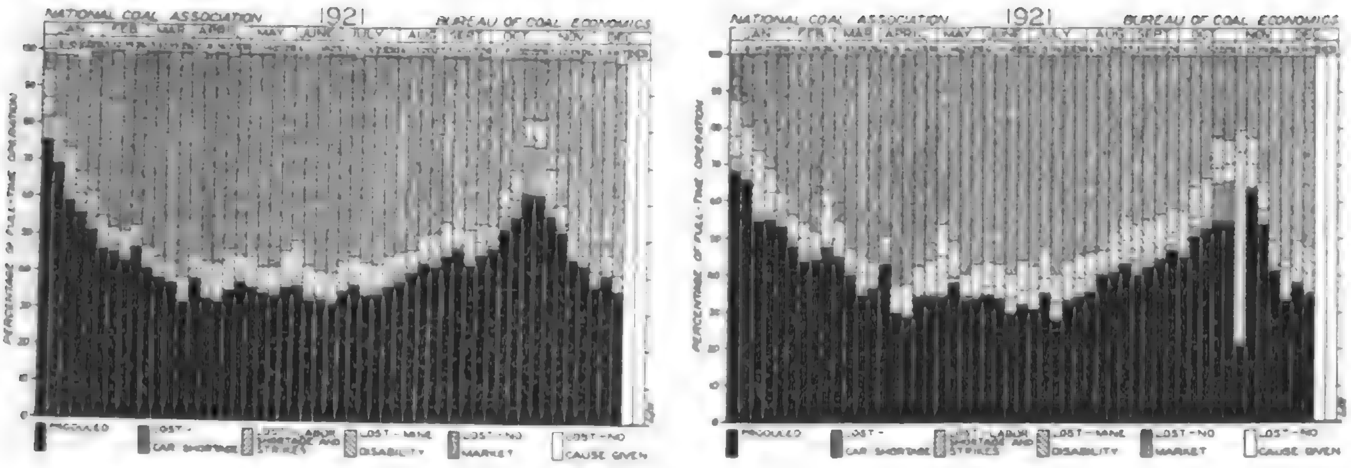
The markets beyond, like Kansas City, St. Joseph and Omaha, a large tonnage for which moves through St.



Western Kentucky

Hazard Field, Kentucky

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES



Illinois Indiana

PERCENTAGE OF FULL-TIME OPERATION OF COAL MINES AND TIME LOST BY CAUSES

Louis, were easing up in their calls.

As the year closed wholesale prices on domestic sizes of Carterville from Williamson and Franklin Counties, Illinois, were $4; screenings $2.25, and mine-run, $3. Duquoin screened sizes were $3.50 and screenings $2. Mt. Olive screened sizes were $4; screenings, $2; standard 6 inch lump and 3 x 6 egg were $3.50; 2 inch lump and 2 x 6 egg and nut were $2.75; mine-run, $2.25, and screenings, $1.30.

St. Louis shippers who for years catered to Southern business, especially west of the river, found it wise to stay away from their former fields of endeavor. Cotton, lumber and rice, the industries that called for coal, were in a pitiable plight. The coal that went South late in 1920 is mostly still unpaid for. This forced the market closer to St. Louis and heavy credits were extended to any who would buy and store coal.

On Jan. 21 another cut was made and the new prices were 75c. less on Standard and Mt. Olive, 25c. less on Duquoin, and from 25c. to 50c. less on Carterville. By the middle of February Pennsylvania anthracite was cut to $15.50 for egg and grate and $15.75 for chestnut and stove with no reduction in the mine price. March 1 saw another 25c. lopped off the Illinois prices and warm weather played tag and was always "it" until April 1 arrived. The spring prices were $5.50 for Standard domestic sizes; $6 for Mt. Olive lump and $7.25 for Carterville, with steam slack at $4.25.

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM MT. OLIVE DISTRICT, BY MONTHS, 1919-1921

QUOTED ON ST. LOUIS, MO., MARKET.

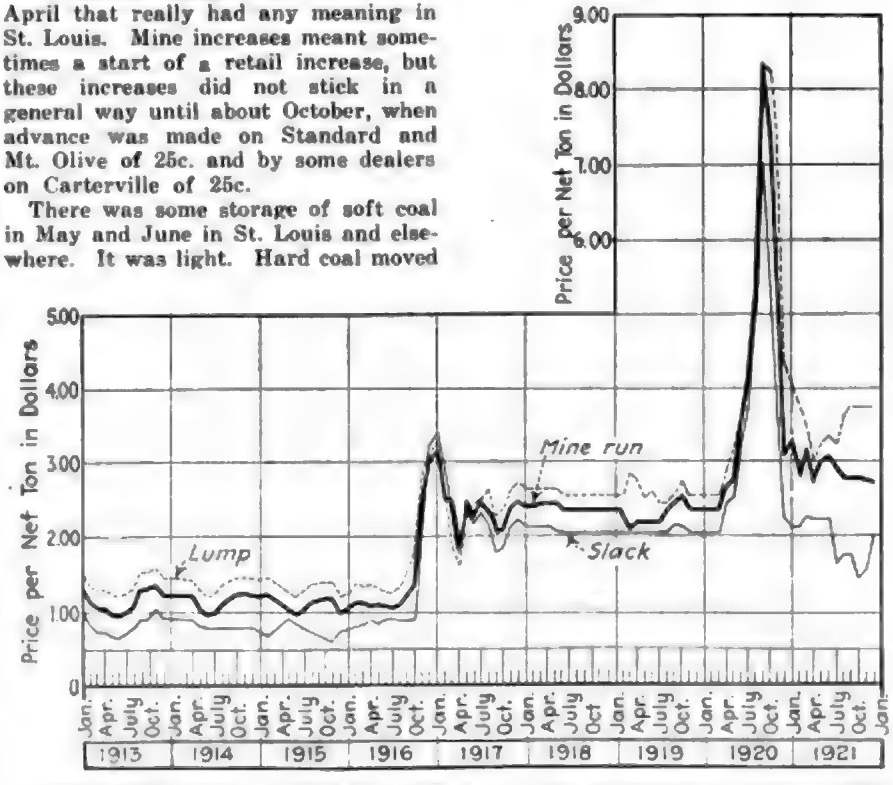
	Lump	Mine Run	Screenings
1919			
January	$2.55	$2.35	$2.05
February	2.85	2.10	1.85
March	2.76	2.20	2.05
April	2.48	2.20	2.05
May	2.62	2.20	2.05
June	2.43	2.20	2.05
July	2.43	2.20	2.05
August	2.55	2.35	2.05
September	2.74	2.45	2.15
October	2.66	2.50	2.13
November	2.55	2.35	2.05
December	2.55	2.35	2.05
1920			
January	2.55	2.35	2.05
February	2.55	2.35	2.05
March	2.55	2.35	2.05
April	2.85	2.65	2.42
May	3.12	2.75	2.50
June	3.60	3.50	3.30
July	4.20	4.00	3.75
August	5.50	5.25	5.00
September	8.34	8.30	7.00
October	8.25	7.38	5.50
November	7.10	5.50	3.75
December	4.32	3.09	2.25
1921			
January	4.10	3.28	2.13
February	3.79	2.82	2.13
March	3.47	3.19	2.29
April	3.00	2.75	2.25
May	3.25	3.00	2.25
June	3.34	3.09	2.25
July	3.25	2.88	1.63
August	3.63	2.25	1.75
September	3.75	2.75	1.75
October	3.75	2.75	1.25
November	3.75	2.75	1.35
December	3.75	2.70	2.00

These circular prices were cut if it needed a cut to get business by some of the so-called retail "wizards" who can sell coal below cost and make money. There may, however, be a difference of opinion between this set and the majority as to what constitutes a ton.

No circular changes were issued after April that really had any meaning in St. Louis. Mine increases meant sometimes a start of a retail increase, but these increases did not stick in a general way until about October, when advance was made on Standard and Mt. Olive of 25c. and by some dealers on Carterville of 25c.

There was some storage of soft coal in May and June in St. Louis and elsewhere. It was light. Hard coal moved in rather well and the country call for chestnut was good through May, June, July and August, but it began to fall off in September. This country demand for chestnut evidently has fallen off as much as 25 per cent since 1915, due to forced substitution of coke and soft coal during the war. The estimated tonnage of hard coal through the St. Louis gateway for local and country shipment in 1921 will not exceed 75,000 tons, of which one firm will get close to 60,000 tons because during the war it treated its Western trade fairly. Anthracite is losing fast in the outside territory west of St. Louis and slowly but surely in the city.

Coke made big strides in 1921. The new byproduct plant at Granite City, Ill., became a factor in the midwest. The St. Louis gas-house coke was scarce throughout the year on account of the



SPOT PRICES F.O.B. MINES ON THE ST. LOUIS MARKET OF COAL FROM THE MT. OLIVE DISTRICT OF ILLINOIS producers using it for water gas. On April 1 coke came down to $9.25 for gas-house sizes and $10 for byproduct sizes. This was in an effort to meet as near as possible the prices on the better grades of Illinois soft coal. Granite City coke in St. Louis retailed for at least 50c. under St. Louis byproduct. On Nov. 15 the price advanced to $10.50 on byproduct and $9.75 on gas house and closed at that for 1921.

The steam movement lagged all spring and midsummer but August saw a little steam improvement, and this was accompanied with a better domestic call from outlying territory. Strikes in Kansas helped Illinois coals and there were fairly good movements to Kansas City, St. Joseph and Ohaha districts.

Retail business in coal in St. Louis was just fair and September did not vary to any great extent from the preceding month up until the last week, and then real business appeared. It was a touch of the old-time panic-stricken public threatened by strikes and it nearly started a real run on coal, but the threatened railroad and mine strikes collapsed, the car shortage failed to materialize, money became scarce and the weather turned warm. While it lasted in October it was a real taste of the times that used to be. It did not, however, stick long enough to push up the retail prices. It caused a little flurry in the wholesale market, but it was artificial and domestic sizes were affected more than steam, although steam got a good start to come back but could not make it. The last week in October saw it slow up and it kept up the pace of slowing up until the end of the year.

In the country wood became cheaper than coal even at the low mine prices that some grades sold at. Freight rates were the stumbling blocks in holding back business in the midwest. Small towns bought from ⅓ to ½ less coal in the last four months of 1921 than at any time in years and it was the cheapest kind when they did buy. Consumers generally sought ways of saving on coal, for its price kept up when other things, including wages, came down. Coal was treated roughly by the newspapers in the Midwest and this had its effect. The supplies carried over in the bins of consumers from last winter gave them an independence that they used to advantage.

To move freely coal must be cheaper. Oil and gas will replace it in many homes and other places. Freight rates must come down and the high-toned contract ideas of shippers must be tossed into the scrap pile. Coal in the Midwest will sell on supply and demand and if Illinois cannot get in at a reasonable figure, non-union Kentucky will take all of the Southern trade in Louisiana and Arkansas and will get as far north as St. Louis and well out into the state, as well as delivering within forty miles in Illinois of the Carterville fields.

Steam users look at it much in the same light as domestic users and the subject of their abuse—the dealer.

A smaller number of sizes in all fields would help most wonderfully in periods of depression. The feeling is spreading among dealers that the fancy sizes are a needless expense in cuddling a pampered public and that a good, clean 2-in. hand-picked lump would do for domestic with 2-in. screenings and mine-run for steam, that it would simplify matters and make the cost of coal and the cost of selling less, and make the situation more agreeable to every factor that enters into coal, from miner to user.

Kentucky Met 1921 "Kicking" Like a Soldier

The Trade Wails but Situation Could Have Been Worse—Retailers Got Fair Price—Jobber Had Tougher Time—Production Slow—Mine Development Curtailed—Hope Centers on New Wage Scale

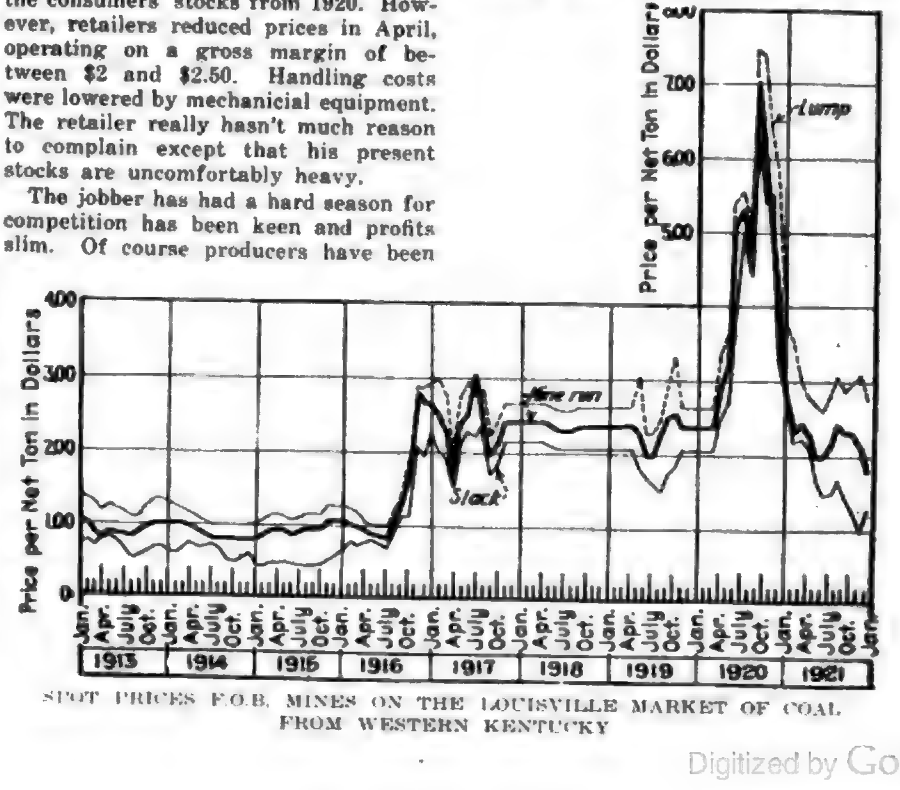
By A. W. Williams

Most Kentucky coal operators, retailers and jobbers complain that the 1921 season has been one of the meanest in the annals of the coal industry. But good coal men, like good soldiers, must "kick" to be happy. Things have been bad in spots, but not unbearable.

Retailers received fair prices during the year, although their volume of sales was small. Mild weather during both spring and autumn reduced consumption. There was some carryover in the consumers' stocks from 1920. However, retailers reduced prices in April, operating on a gross margin of between $2 and $2.50. Handling costs were lowered by mechanicial equipment. The retailer really hasn't much reason to complain except that his present stocks are uncomfortably heavy.

The jobber has had a hard season for competition has been keen and profits slim. Of course producers have been forced to depend on the jobber more this year than during the war when the operator had business thrust upon him. In 1921 some were so slow in getting started that the early bird tied up contracts. Many concerns closed down. Quite a few mines in the state have been down for months.

The big slump in industrial demands during the past year was felt at Louisville as well as all other points, although Louisville is really more of a jobbing than a manufacturing center.



SPOT PRICES F.O.B. MINES ON THE LOUISVILLE MARKET OF COAL FROM WESTERN KENTUCKY

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL, FROM WESTERN KENTUCKY, BY MONTHS, 1919—1921

QUOTED ON THE LOUISVILLE, KY., MARKET

	Lump	Mine Run	Screenings
1919			
Jan.	$2.60	$2.35	$2.05
Feb.	2.60	2.35	2.05
Mar.	2.60	2.35	2.05
Apr.	2.60	2.35	2.05
May	3.04	2.28	1.80
June	3.26	1.88	1.65
July	2.27	1.96	1.55
Aug.	2.44	2.26	1.50
Sept.	2.93	2.48	1.72
Oct.	3.32	2.51	1.84
Nov.	2.60	2.35	2.05
Dec.	2.60	2.35	2.05
1920			
Jan.	2.60	2.35	2.05
Feb.	2.60	2.35	2.05
Mar.	2.60	2.35	2.05
Apr.	3.35	2.93	2.44
May	3.60	3.17	2.67
June	5.40	5.08	4.00
July	5.55	5.32	4.97
Aug.	4.92	4.69	4.44
Sept.	7.47	7.03	6.32
Oct.	7.40	6.15	5.40
Nov.	6.38	5.12	5.50
Dec.	5.73	4.10	3.29
1921			
Jan.	3.75	2.89	2.88
Feb.	3.55	2.27	2.18
Mar.	3.00	2.40	2.20
Apr.	2.79	2.30	2.10
May	2.66	1.99	1.65
June	2.56	1.99	1.47
July	2.78	2.14	1.50
Aug.	3.05	2.40	1.66
Sept.	2.86	2.30	1.40
Oct.	2.98	2.30	1.24
Nov.	3.09	2.13	0.98
Dec.	2.74	1.78	1.25

For the first nine months of the year rail movement of coal to Louisville is given at 20,941 cars, or 964,505 tons. Water movement to Louisville from upper river points for ten months of the year was 45,161 tons. Average consumption of coal for normal times in Louisville is 1,500,000 tons annually and for the state, 6,500,000 tons.

Statistics on Louisville movement are as follows:

RECEIPTS OF COAL BY RIVER
(In Net Tons)

	1921	1920	1919	1918
January	1,400	3.622	1,080	0
February	970	7.800	430	0
March	1,035	4,040	9.462	2.800
April	14.533	7,520	1.600	7.594
May	5.168	7,374	1.260	12.855
June	10.910	9,692	17,046	5,251
July	4.405	8,693	3.210	40,357
August	2.000	5,189	4.586	975
September	2.765	2,399	1,839	5,231
October	1,975	0	4,823	4,530

RECEIPTS OF COAL BY RAIL

	1921		1920	
	Number Cars	Number Tons	Number Cars	Number Tons
January	2,846	125,264	3,203	128,536
February	2,378	106,643	2,602	119,170
March	2,582	120,480	2.794	127,357
April	2,197	101,108	2,433	113,308
May	2.446	115,085	2,031	84,606
June	2.473	116,606	2.473	110,481
July	1,644	76,647	2,280	106,634
August	1.975	90,652	2.376	105,170
September	2,409	112,020	2,238	103,484

Movement of coal as a whole from Kentucky fields last year was larger than for some years past, due to better car supply. Western Kentucky maintained prices well and had such a good traffic organization for reduced freight rates and a larger field that she secured through rates to Arkansas points and to numerous points in the middle states adding thousands of towns that couldn't be reached except on combination rates in the past.

Average prices for the eastern Kentucky field are not available although it is believed by prominent coal men that the average on a mine run basis was not much if any over \$2.50@\$2.75.

Statistics on production in Kentucky for the year, based on Geological Survey reports recently issued for ten months, show 24,420,000 tons for the ten months. Estimated monthly production was: January, 2,568,000 tons; February, 2,028,000; March, 2,100,000; April, 2,053,000; May, 2,489,000; June, 2,659,000; July, 2,311,000; August, 2,562,000; September, 2,601,000; October, 3,049,000.

Because of the threatened rail strike October was the largest month of the year in coal shipping. With 3,049,000 tons in Kentucky alone and heavy production elsewhere trouble resulted because much of the shipping was done on a consignment basis on mere prospects of selling the coal if the strike materialized. There was a heavy demand at fancy prices. In some cases it became necessary to practically give some of this coal away to escape heavy demurrage. During October the Louisville & Nashville R.R. handled 52,717 cars of coal produced in mines on its lines, as against 51,175 cars in December, 1920, the largest previous month, making a net increase of 1,542 cars over any previous month in the history of the road.

Figures based on 50-ton cars showing movement from all Louisville & Nashville mines for ten months of the year, are reported as follows:

	1921	1920	1919	1918
January	42,839	40,113	34,510	36,632
February	35,334	36,900	28,672	37,254
March	35,423	35,113	31,091	37,750
April	33,447.4	29,917	29,579	39,345
May	42,042 9	36,101	32,793	42,288
June	38,962.2	36,287	33,153	40,775
July	38,390.5	43,065	36,240	43,706
August	43,454.4	44,419	32,232	42,230
September	44,798.3	41,584	39,494	41,992
October	50,300.9	38,119	45,348	38,737

There was not as much development work at new mines or improvement of old ones last year as during recent previous years. However, there are some interesting improvements under way in eastern Kentucky, where the L. & N. is improving yards, trackage, spurs, etc. in order to handle larger tonnage. The road also built many coal cars last year. There was much interest in the proposed development of the Henry Ford interest in eastern Kentucky, which may result in a new line down from around Ashland, Ky.

The outlook for 1922 is puzzling to mine interests here. Right now western Kentucky is under union contract and is suffering because of wage cuts in non-union eastern Kentucky, but is protected by the fact that Indiana and Illinois are holding firmly. The whole industry awaits with keen interest the termination of union wage agreements at the end of March, when, according to many coal men, wages are going down and West Virginia and eastern and southeastern Kentucky stand a strong chance of putting some of the other unionzed districts on the run.

Chicago and Middle West Finish Unhappy Year; Market Generally Dull Throughout

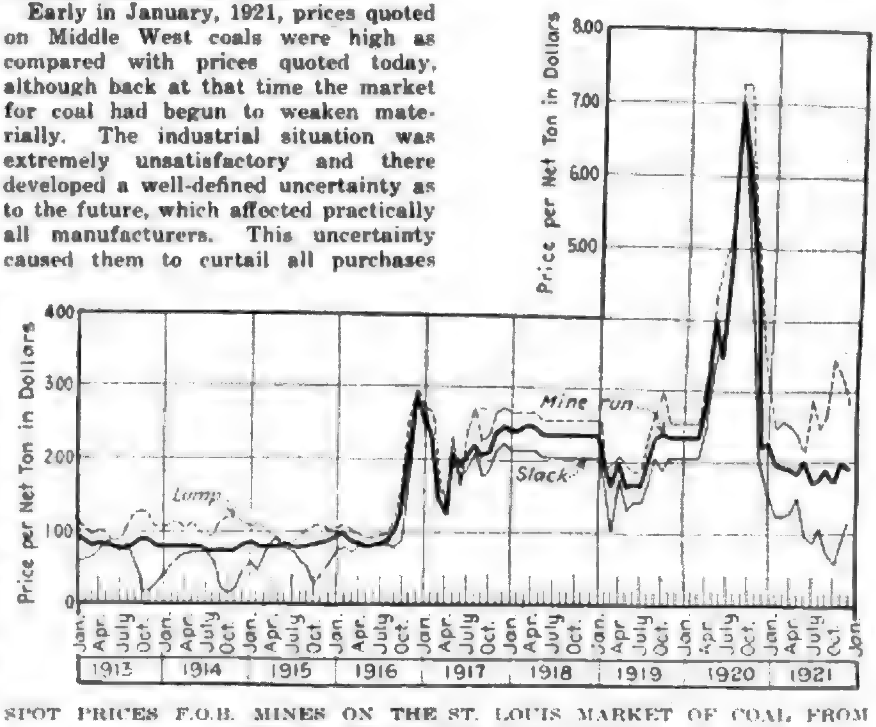
Spot Buying Gets 70-80 Per Cent of Business—Strike Threats Prod Trade for a Few Weeks, but Torpor Settles Down Again —Factories Beginning Now to Stock for April Mine Strike

By Haven A. Requa

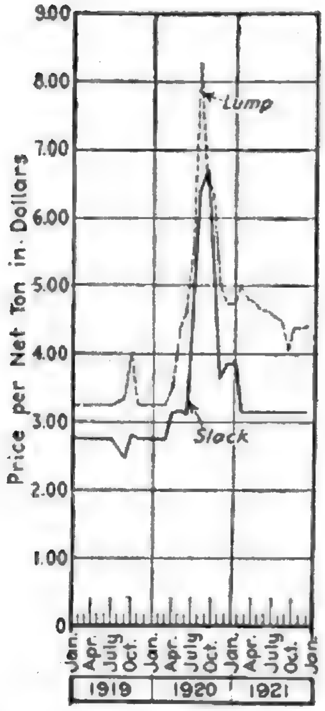
There are going to be very few operators with mines in the Middle West who will remember 1921 with any degree of pleasure. The year just ended was one of the most unfortunate that the coal industry had ever had to cope with. From start to finish the market was weak and prices declined steadily from January to December. This unfortunate condition is, perhaps, brought home to us all the more by way of contrast, because 1920 was one of the best coal years the Illinois and Indiana mines ever experienced.

Early in January, 1921, prices quoted on Middle West coals were high as compared with prices quoted today, although back at that time the market for coal had begun to weaken materially. The industrial situation was extremely unsatisfactory and there developed a well-defined uncertainty as to the future, which affected practically all manufacturers. This uncertainty caused them to curtail all purchases of raw material, and consequently coal was affected among the first. During January and February there was a steady decline in prices on practically all grades of coals consumed in this market.

When the season for contracts came around it was found that many big industries were planning to buy coal on the open market, rather than contracting, as they had generally done in previous years. The fact that relatively few contracts were closed



SPOT PRICES F.O.B. MINES ON THE ST. LOUIS MARKET OF COAL FROM THE STANDARD FIELD OF ILLINOIS



SPOT PRICES F.O.B. MINES ON THE CHICAGO MARKET OF COAL FROM NORTHERN ILLINOIS

last year injected into the coal situation a strong feeling of uncertainty, which immediately made itself felt through lower quotations. The temptation to cut prices was great, as practically all sales agents were anxious to give their mines running time, therefore there was a mad scramble for what little business was available. It is quite safe to say that perhaps 70 to 80 per cent of the tonnage sold in the Middle West this year was sold on the open market—a most unusual circumstance.

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM CENTRAL ILLINOIS, BY MONTHS, 1919-1921. QUOTED ON CHICAGO, ILL., MARKET

	Lump	Mine Run	Screenings
1919			
January	$2.55	$2.35	$2.05
February	2.60	2.35	2.05
March	2.65	2.35	2.05
April	2.65	2.35	2.05
May	2.65	2.23	2.05
June	2.70	2.23	2.05
July	2.70	2.23	2.03
August	3.25	2.25	2.03
September	2.63	2.25	1.90
October	3.00	2.40	2.20
November	2.55	2.35	2.05
December	2.55	2.35	2.05
1920			
January	2.55	2.35	2.05
February	2.55	2.35	2.05
March	2.85	2.55	2.25
April	3.13	2.88	2.55
May	3.50	3.10	2.80
June	4.00	3.59	3.35
July	6.25	6.00	6.00
August	9.00	8.25	7.25
September	8.00	7.45	5.88
October	7.13	4.95	4.97
November	5.60	4.31	3.07
December	4.63	2.98	2.35
1921			
January	3.53	2.38	1.72
February	2.88	2.00	1.58
March	2.63	2.00	1.75
April	2.97	2.44	1.70
May	3.25	2.79	1.75
June	2.90	2.43	1.62
July	2.53	2.35	1.65
August	2.66	2.24	1.58
September	2.70	2.38	1.66
October	2.50	2.25	1.45
November	3.26	2.60	1.60
December	3.23	2.43	1.68

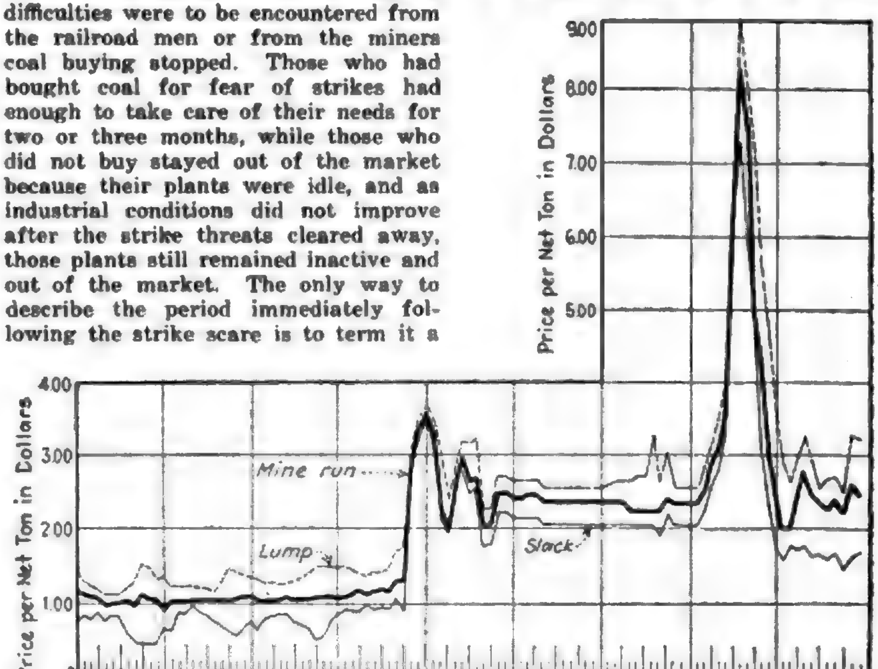
In normal years the early summer months see the retail dealers buying domestic coal in order to stock up for the threshing season as well as for the winter months. This year this class of buyer was conspicuously absent, and all summer what little domestic coal was sold was practically forced out on the trade. In addition to this, the Illinois and Indiana operators received serious competition in the Northwest from the docks at the Head of the Lakes. In some instances dock freight rates were lowered and quotations also reduced, all of which tended to make it far more difficult to sell Indiana and Illinois coals in the Dakotas and Minnesota. Toward the end of the summer the demand for domestic coal was no better. Retail dealers all maintained that their customers were not buying, or if they were buying, were purchasing in one or two ton lots or less.

During the autumn months the Middle West market enjoyed its only period of activity for the whole year. This stimulation was brought about by the threat of a railroad strike, very closely followed by the menace of a strike among the coal miners. Both controversies, however, were temporarily settled and our strong market only lasted a few weeks. What looked to operators and sales agents alike like a good market last year would hardly stand out in normal years as anything above the average, but the industrial depression was so manifest that even a very slight change for the better in the way of a demand for coal was very noticeable indeed.

After the public realized that no difficulties were to be encountered from the railroad men or from the miners coal buying stopped. Those who had bought coal for fear of strikes had enough to take care of their needs for two or three months, while those who did not buy stayed out of the market because their plants were idle, and as industrial conditions did not improve after the strike threats cleared away, those plants still remained inactive and out of the market. The only way to describe the period immediately following the strike scare is to term it a complete stagnation. As the year ended no noticeable recovery in the market had taken place.

During the last few weeks of the year the weather was unseasonably warm and, consequently, the normal demand for domestic coal was entirely lacking. Operators, therefore, ran their mines only one or two days a week when they ran at all. This short running time brought about a little demand for steam coals, so prices on screenings strengthened to around $2 per ton. There is no doubt that screenings prices will remain at this level for some time to come, because even should some cold weather force the mines to take care of their domestic demands, the call for screenings now is such that the price will be maintained. Factories are buying in anticipation of an April strike and they feel that prices on steam coal will advance slowly but surely as April 1 draws near. Quite naturally purchasing agents wish to buy at the lowest level of the market so they are now starting to purchase.

All year Illinois and Indiana operators were at a decided disadvantage, because they were called upon to compete with non-union coal from fields in eastern Kentucky and West Virginia. As is pretty generally known, Indiana and Illinois mines are strongly unionized, consequently any reduction in mine labor is out of the question. In portions of the East, however, the situation is entirely different, as operators in a great many cases are able to keep their labor costs more in line with the market on coal, thus putting operators in Illinois and Indiana with fixed labor costs, at a disadvantage. As the year drew to an end Illinois



SPOT PRICES F.O.B. MINES ON THE CHICAGO MARKET OF COAL FROM CENTRAL ILLINOIS and Indiana operators found their customers in the Middle West buying Eastern coal and buying it at prices f.o.b. their stations cheaper than they could buy coal from our own fields. As a general rule, Eastern coal is of a higher grade than Middle West coal, so it can be readily seen the harm this unnatural situation has brought to our own operators.

The year 1922 is going to prove interesting for the Middle West coal trade. In the first place our operators will have to decide how they can combat their Eastern rivals who, at the present time, are depriving them of their natural market. In the second place, it is not drawing too much on the imagination to predict that the railroads are going to have trouble with their labor when rates are to be reduced, and in the third place, those closely in touch with the coal situation are expecting trouble with the miners April 1. Taking all these matters into consideration, it is quite safe to say that 1922 will at least see a few periods of active markets.

So far as the industrial situation is concerned, it is reckless and hazardous to predict what 1922 will have in store for us. Almost everyone realizes, of course, that 1921 took us a long way back on the road to normalcy and that this path will not have to be traversed again.

The feeling of the coal man is that 1922 will show a decided improvement over the year just ended, but when pressed for his grounds for this opinion he is rather vague, arguing mainly along grounds that fundamentally the economic situation of this country is much sounder than it was a year ago.

SPOT PRICES F.O.B. MINES, OF BITUMINOUS COAL FROM SOUTHERN ILLINOIS, BY MONTHS, 1919—1921

QUOTED ON CHICAGO, ILL., MARKET

	Lump	Mine Run	Screenings
1919			
Jan.	$2.55	$2.35	$2.05
Feb.	2.55	2.35	2.05
Mar.	2.89	2.43	1.97
Apr.	2.65	2.43	2.03
May	2.65	2.43	2.03
June	2.80	2.40	2.02
July	2.38	2.35	2.10
Aug	3.00	2.50	2.00
Sept.	2.85	2.53	2.20
Oct.	3.13	2.55	2.20
Nov.	2.55	2.35	2.05
Dec.	2.55	2.35	2.05
1920			
Jan.	2.55	2.35	2.05
Feb	2.55	2.35	2.05
Mar.	2.55	2.35	2.05
Apr.	3.28	3.05	2.68
May	3.70	3.30	2.80
June	4.03	3.60	2.90
July	4.24	3.32	3.67
Aug	8.13	7.50	7.50
Sept.	7.80	6.98	6.73
Oct.	6.69	6.25	5.60
Nov	6.18	5.04	4.24
Dec.	4.96	4.08	3.12
1921			
Jan.	3.96	2.90	2.60
Feb.	3.83	2.75	1.63
Mar.	3.62	3.00	1.70
Apr.	3.55	3.38	1.80
May	3.72	3.28	1.90
June	3.60	2.96	1.96
July	3.60	3.04	1.77
Aug	3.59	3.12	1.80
Sept.	3.66	2.92	1.87
Oct.	3.20	3.00	1.74
Nov.	3.72	2.90	1.58
Dec.	3.63	2.80	1.90

Duluth Looks Into 1922 with Some Optimism

Docks at Head of Lakes Are Brimming Full—Industries Expected to Stimulate Demand Soon—Shipments from Lower Lake Ports Exceed 1920 by Over a Million Tons

BY S. M. CHAMBERS

Docks brim full of coal of all descriptions throughout the year and a drop in prices within the last few days are the outstanding features of the 1921 coal situation at the head of the Lakes. Following a year in which prices were steady, especially after a new range from the levels of 1920 was made effective May 1, the market held steady until almost the last week in December. Then it sagged because of lack of demand and because dock men grew anxious to get some of their huge stocks turned into cash.

Dock men, however, are far from despondent at the outlook for the coming year, believing that industries will soon start up which will give them a ready market for their oversupply. The most optimistic, however, will not admit that there is any possibility of a scarcity of coal before the opening of navigation next spring, and the best that can be hoped for now is a sufficient clearing of the docks to permit of enough storage room for the normal amount of upbound coal next year, so that the carriers will not have to come up light during the major portion of the season.

In following the price level through the year a general downward bend may be noted. Never at any time did the price curve turn upward except in remote cases where special grades, which sold off at intervals because of oversupply, regained former levels.

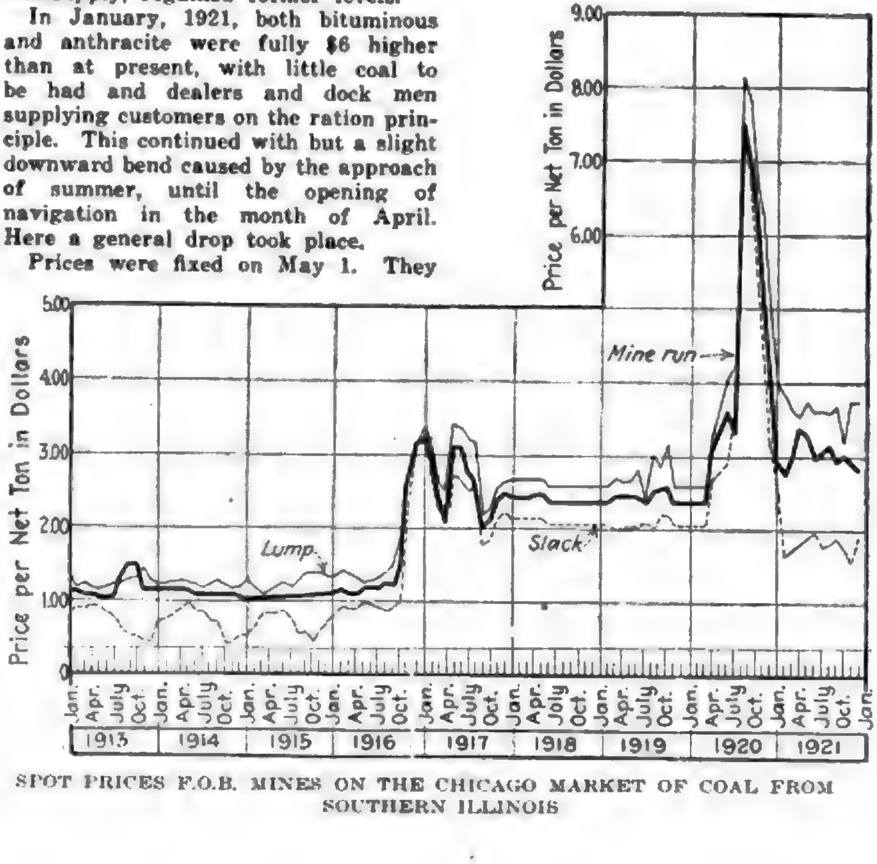
In January, 1921, both bituminous and anthracite were fully $6 higher than at present, with little coal to be had and dealers and dock men supplying customers on the ration principle. This continued with but a slight downward bend caused by the approach of summer, until the opening of navigation in the month of April. Here a general drop took place.

Prices were fixed on May 1. They ranged as follows: Youghiogheny and Hocking lump, $7; run-of-pile, $6.25; screenings, $4. Pocahontas lump, $10; run-of-mine, $7. Anthracite was set as follows: Egg, $12.35; stove and nut, $12.60; pea, $10.60, and buckwheat, $8.50.

A shortage of coal was feared for this year similar to the one at the end of last year and prices held fairly steady until it became evident in August and September that there would be no shortage and that the only difficulty would be to find dockage for the coal until dealers should make up their minds to buy. Even with this condition evident prices held firm in the main, and dock men expressed the fear that when the cold weather came dealers and manufacturing concerns would be unable to fill their demands.

But hope for resumption in the bituminous trade proved unfounded, as many of the iron-ore mines on the Mesaba range closed one at a time throughout the summmer and failed to resume to build up their dumps throughout the winter. Mills in Duluth and the surrounding Northwest closed up, and have only lately been reopening in a desultory manner.

Despite the lack of trade, prices were maintained and only in one or two places did any weakness show. Buckwheat was the slackest of the hard coals with drops of $1 under the fixed



SPOT PRICES F.O.B. MINES ON THE CHICAGO MARKET OF COAL FROM SOUTHERN ILLINOIS

SHIPMENTS FROM DULUTH AND SUPERIOR DOCKS

(In Carloads)

Month	1921	1920
January	8,403	35,908
February	8,164	32,202
March	7,450	20,177
April	5,830	10,400
May	7,883	8,444
June	9,557	10,401
July	13,448	15,052
August	20,009	19,906
September	18,735	21,126
October	28,722	20,286
November	18,276	20,453
December	*15,000	12,621
Total	161,477	226,976

* Estimated.

price, and screenings frequently went to $3 in the bituminous family, chiefly because of the fire hazard, as some docks were reported as short throughout the season.

One small drop in price was recorded in November, but the market rallied and until the final drop at the close of December it was thought that prices would come through at the list. Final prices are about $1 lower all around than those given above.

A comparison of shipments from the docks, given in carload lots, shows the decrease in outward shipments during 1921. The December total for 1921 has been estimated at 15,000 tons. Official figures for December are not available at this writing.

These figures show that with the unusually heavy shipments from lower Lake ports, which totalled 10,164,849 tons and exceeded the previous year's supply by 1,134,183 tons, or 12.56 per cent, the docks were more than crowded early in the year.

Coal came into the local port steadily throughout the year with the heaviest traffic in May, June, July and August. There were received 1,844,642 tons of anthracite and 8,320,207 tons of bituminous.

Despite present conditions an optimistic attitude is everywhere evident in the coal trade. Coal men here feel that is is only a matter of time before the large industries of this section will open up, and that when this occurs there will be a great demand for coal and that the docks will be cleared of their surplus stocks.

Since Buyers' Strike of 1920, Consumer Has Had Control of Northwest Coal Market

Able to Get Along for Awhile Without Coal, Purchasers Have Held Off, Hoping for Lower Market—Market Torn Between Intimations of Famine and Drop in Prices

By G. A. Welch

On the heels of a sharp slump in values which set in about the beginning of December, 1920, the 1921 coal trade in the Northwest fell into a depression from which it has not yet recovered. The primary cause of the depression was temperamental. For several seasons the people of the Northwest have had it hammered into them during all their conscious moments that coal is a scarce and precious article which can be obtained only by extraordinary efforts and by making desperate appeals. All through 1920 this was the theme, major and minor, which was projected at them.

When the break came and the extravagant prices of the autumn of 1920 began to slide downward, it was realized that the buyers' strike had been successful, and there has not been a minute since that time that they have not been in control.

The general refusal to buy was not an organized movement by any means. It was a resentment against the prices that had prevailed, augmented by the tight money situation which made it exceedingly desirable to confine all purchases to as narrow a volume as possible. People have not bought coal because they could get along without it for some time. They were glad to do this, because they always hoped that some miracle would happen whereby they could get prices down still further.

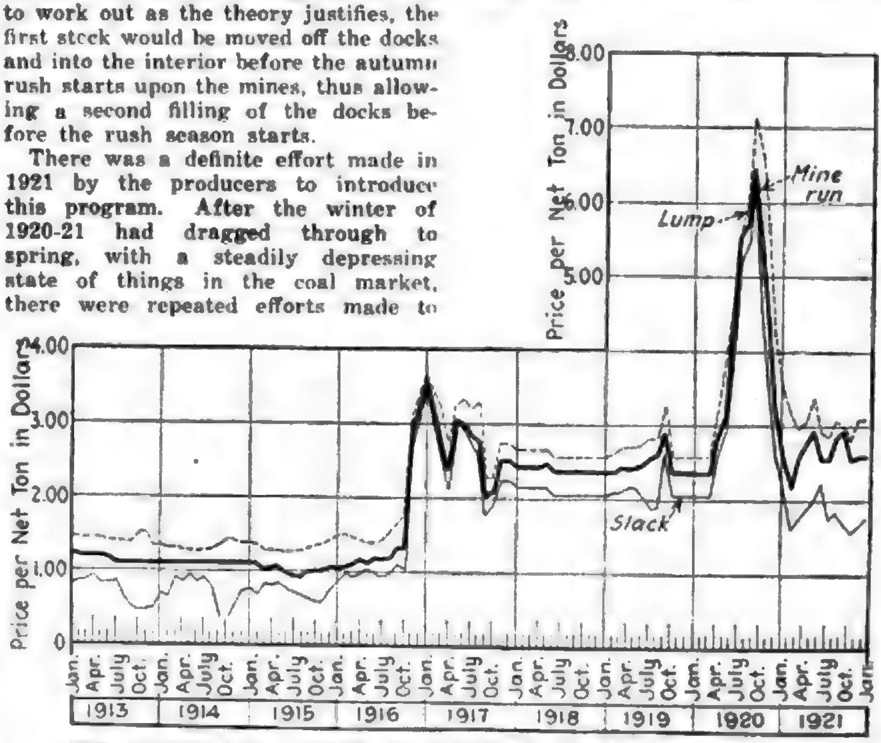
The situation in the Northwest is unique in the coal business. It is about the only place where there are facilities for accumulating any great stocks in the summer for use during the succeeding winter. Here the docks at the Head of the Lakes have storage space for fully 50 per cent of the winter's needs. If the arrangement were to work out as the theory justifies, the first stock would be moved off the docks and into the interior before the autumn rush starts upon the mines, thus allowing a second filling of the docks before the rush season starts.

There was a definite effort made in 1921 by the producers to introduce this program. After the winter of 1920-21 had dragged through to spring, with a steadily depressing state of things in the coal market, there were repeated efforts made to frighten people into buying coal early —to avert a "famine." A famine seems of little moment in the spring, anyway, but especially so when things were receding and there seemed to be little chance of anything being scarce. People would not buy.

They were threatened with a graduated scale of ascending prices if they did not buy early. But it had no effect. Possibly the argument might have been more effective had it not been for a constant stream of intimations that somewhere, somehow, prices were to be reduced. It was to be either through a freight reduction or a new combination of lake and rail freight or in some undetermined manner. There was a reduction in the lake and rail combination during the summer, but it was offset by a revised freight schedule through the Northwest, which resulted in more increases than otherwise.

Brave efforts were made to maintain the list prices which had been put forth with the opening of the season. Some courageous souls adhered to their lists in the face of prices which upon their basis of figuring were at net cost, or possibly a little under. They maintained their principles and to a considerable extent retained their coal. Others figured that in times like these the principal thing was to turn coal into money. If they could not get an order at the list price, it might be possible to induce one at less than list. Competition became keen and keener. It usually proved that there was someone who needed business sufficiently to write it at a concession.

As a result of the abnormal conditions, dock prices have been cut from the list by as much as 40c. to 60c. on soft coal. Hard coal, of course, has maintained its price. That is one item which does not fluctuate. These re-



SPOT PRICES F.O.B. MINES ON CHICAGO MARKET OF COAL FROM FOURTH AND FIFTH VEINS, INDIANA duced figures have been current late in the autumn and at the opening of winter.

The all-rail factors of Illinois and Indiana apparently has yielded for the present on much of their tonnage in this territory. In the lake and rail freight rate they had an adverse freight total on competitive coal to work against, which narrowed their field appreciably. But even in their usual field of the Twin Cities and South, they did not furnish the keen competition for business that has ever marked them in the past. They were unable to do much during the summer, as there are no facilities for storing this coal. It must be put into the consumers' bins beyond a small tonnage which can be stored in dealers' yards. Hence with no buying going on through the summer and autumn, there was practically no business moving until toward cold weather. Then only a moderate tonnage was moving, because they did not seem to be able to meet competition beyond a limited field. They had cut down production to a fraction of a week, and so had less surplus coal which would seek a market in the Northwest. Even when winter came on they did not seem to have the aggressiveness of former years of hard-earned business.

Their price at the mine has been trimmed all the way from 30c. to 50c., but despite all concessions and strong-arm methods of selling, the situation has been and continues to be a slow and dull one.

Northern West Virginia Output Drops to Half

Lake Trade Disappears Early in 1921—Region Fared as Well as the Best — Labor Situation Quiet — Row Starts Over B. & O. Purchase of Indian Creek Spur

By R. A. Williamson

NORTHERN West Virginia produced far less coal in 1921 than in 1920. The year's output will not exceed 14,365,000 net tons, whereas shipments for 1920 were 22,758,000 net tons. It was a discouraging year. Those companies with the foresight and good fortune to make contracts at what was considered a low price have not fared so badly. Almost without exception the other mines are shut down.

The Lake trade, usually depended upon to bolster up a bad year, helped during the first part of the season but took a slump and with the exception of one company practically no one shipped any Lake coal. In 1920 the shipments totaled approximately 1,284,000 net tons. In 1921 they amounted to 642,000 tons, a loss of 50 per cent. When the figures are available it probably will be found that during the year about 10 per cent of the mines of northern West Virginia were shut down at least part of the time and that a fair average of working time for the others was about 40 per cent, or between two and three days per week. Yet it is generally conceded that the region fared as well as the best in securing tonnage.

The labor situation has been quiet and turnover is negligible. Some mine owners, particularly the Northern West Virginia Coal Operators Association, hold that the contract with the United Mine Workers must stand and that there could be no change in rates until it expires. In a few isolated cases small operators have repudiated the union scale and are running, apparently with little or no labor trouble.

The railroad-car situation is reversed. Instead of a constant shortage there has been an almost constant surplus. The most important railroad feature of the year was the agitation for lower freight rates. The demand of the operators for lower rates and their assertion that they cannot exist without some relief, the reply of the railroads that they cannot run at all if rates are cut, and the violent effort of Ohio to obtain some further advantage over West Virginia competition have been at the fore all year. The freight goes steadily on, apparently with no end in sight.

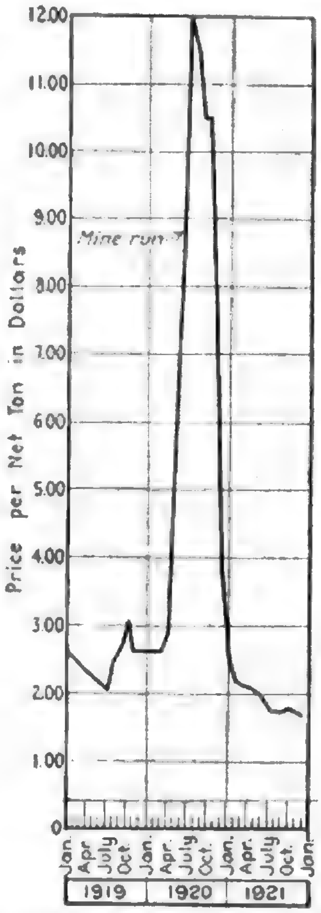
Another railroad problem has arisen. Recently a spur line was projected from the Monongahela Ry. up Indian Creek, in Monongahela County, West Virginia, about ten miles north of Fairmont. This spur opens up a virgin coal field. It is already long enough to have several mines now giving it tonnage, and a large amount of territory has been purchased ahead of its construction. This road was privately constructed and its purchase by the Monongahela Ry. was taking shape. It now develops that the Baltimore & Ohio R.R. has purchased this spur from the builders and has asked the Interstate Commerce Commission for a confirmation of the purchase.

The operators and owners of coal lands on the projection have made vigorous protest. They assert that the Monongahela Ry. is the logical road to purchase and own this spur, that the Monongahela has practically completed arrangements to take it over and that the B. & O. has acquired the spur through underhand work. They further assert that the B. & O. will simply throttle the spur because it would give tonnage to a competitor, that their lands will remain undeveloped, and they will lose large sums of money. The argument is attracting much attention.

Transfers of coal lands and dealing in both developed and undeveloped properties has continued. Early in the year a number of new companies were organized and operations started. As the depression in the coal business increased from month to month these various projects slackened up; on some work was suspended, some were abandoned indefinitely and a few have continued. At the end of the year practically no new development work was going on, but trading in acreages of various coal seams was still somewhat active.

Inquiries were still coming in from other industries for operating coal properties, apparently with the idea of having their own fuel supply, but few of these inquiries have resulted in actual acquisitions of coal lands by such concerns.

One notable transaction was consummated toward the end of the year by which the coal property of the Monongahela Power & Railway Co. was purchased by the Consolidation Coal Co., the price mentioned being somewhere in the neighborhood of three million dollars. By this deal the Consolidation Company acquires something like 4,500 acres of Pittsburg coal including the mining plant purchased some years ago by the Monongahela Company from the New Central Coal & Coke Co.



SPOT PRICES F.O.B. MINES ON THE PHILADELPHIA MARKET OF MINE-RUN COAL FROM THE FAIRMONT DISTRICT

Considering the slump the coal business has taken during the year, together with the number of small companies which have been operated in many cases in a very haphazard way, it is surprising and gratifying to find so small a number have actually failed. How long these companies can continue to weather the storm is problematical. It is to be hoped that relief in some form will make its appearance during 1922.

Seesawing of Prices and Demand Brings About Chaos in Kansas Coal Field

Dumping Practice and Cut-Throat Competition the Chief Factors in Unsettling the Industry—Operators Are Hopeful But Wary of Making Predictions

By E. J. Knickerbocker
Kansas City, Mo.

THE year just closed probably was one of the worst, if not the worst, the coal trade has ever experienced. It was thought that the operator would profit by the example set by the Fuel Administration appointed by the President during the Great War and continue the business on a stabilized basis, but as soon as the demand for coal slackened, operators in outside fields began to dump coal in markets that they did not ordinarily supply, hoping thereby to keep their mines in operation. This practice of dumping, together with the decrease in price of fuel oil, created a condition that was chaotic, to say the least.

In some instances it was found that operators would offer coal to jobbers at a much less price than the sales agent had quoted the same day to the same trade. This cut-throat competition started in February and grew worse from week to week till the close of the year. Operators were sacrificing domestic or screened grades of coal so as to produce steam grades for which they had a market, and the next week they were sacrificing steam grades, so as to fill orders they had on their book for domestic grades.

Fuel oil began to advance in October and continued on the upgrade right along until some steam plants which had taken to oil during the early summer reverted to coal, and at the close of the year the demand for slack or steam grades was nearer normal than at any time during the year, and this resulted in a surplus of lump coal right in midwinter, when the contrary might with reason have been expected.

The chaotic condition applied to all grades of coal; the continued seesawing resulted in all grades reaching a level which was even below the cost of production for mine-run.

No class of trade was better than another and no one grade of coal was in better demand than another for any length of time. The seesawing in demand for different grades of coal was a steady up and down with coal operators on both ends of the board and they received a bump every time they came down and they did not stay up long enough to enjoy any benefits.

As to the outlook for the new year, it is anybody's guess. Operators are hopeful but afraid to make any prediction. This section, being largely of agricultural and live stock interests, is hard hit by the low prices that have prevailed for grain, cattle and hogs, and anything that will benefit the farmers and stockmen will result in benefit to all class of business, including coal. Locally, Kansas mines were hit harder than most coal fields due to the long strike and fight Alexander Howat made against the Industrial Court Law of Kansas. At the close of the year this strike had resulted in Kansas miners losing hundreds of thousands of dollars in wages, operators losing money by reason of their mines being closed and in addition losing trade to outside fields, and all Mr. Howat has gained is a cell in the County Jail.

Colorado Operators Look Hopefully Into 1922

Last Year's Production, Fluctuating Wildly from High to Low Totals 3,500,000 Tons Under 1920—Bituminous Prices Drop With Wages—Mine Owners Expect Union Scale to Smash Up

By W. E. Boyer

ALTHOUGH Colorado's output for 1921 was about 3,500,000 tons less than in 1920, determination to meet obstacles, including industrial slumps, strikes and general unrest among consumers is written in the irregular line on the coal chart kept by the Colorado and New Mexico Coal Operators Association. New records were established, wherein high and low tonnage figured. Operator and retailer both lost financially. The consumer was indifferent and unwilling to listen to anything but the announcement of a cut in prices.

Operators in Colorado are not over-optimistic; neither are they pessimistic about 1922; but many see a repetition, on a smaller scale, perhaps, of last year's uncertainties and hazards, including a general disruption when the miners' contract throughout the country expires March 31. This contract is intact where union forces predominate, but unions have no standing with the Colorado Fuel & Iron Co., the largest operator in the state.

The United Mine Workers was effectively subdued during the closing months of the year, but not disorganized. This was an indirect factor in bringing down the price of lump bituminous $1 after wages had been cut about 33 per cent in certain mines. Weather conditions unfavorable to the burning of fuel on a large scale and unrealized expectations of freight-rate reductions both had their effect in bringing the "worst coal year Colorado has ever experienced."

Such is the assertion of Harry F. Nash a member of the Colorado state transportation committee, a member of the traffic committee of the coal operators' association and vice-president of the Oakdale Coal Co. He refers to a coal chart that shows a tonnage of 250,000 for both the first week in 1921 and the first week in 1920. The second week in January, 1921, production jumped 35,000 tons. This proved to be the highest week's tonnage of the year and equalled the high record for 1920.

Like 1920, the year just closed reached the high tonnage level of 285,000 twice, the last time in the third week in October. But the closing weeks in December brought production to the unprecedented low level of 115,000 tons a week, just what the low summer tonnage was in the third week in June. During a period of ten weeks—from early in January to the middle of March—there was a difference in the weekly tonnage between these two calendar points of 160,000. Another toboggan slide of ten weeks ran from the latter part of October to the closing days of December.

Colorado mines produced approximately 9,000,000 tons in 1921, against 12,500,000 tons in 1920. The 1920 average weekly output was 240,559. In 1921 it was less than 200,000 tons. Development of mining properties was perhaps not up to the average because of a reduced tonnage and on account of unusual activities during 1920.

"One of the greatest difficulties operators are facing is the unjust freight rates on all Colorado consignments to competitive territory, as compared to freight rates from all other producing fields to that competitive territory," says Mr. Nash. "This territory in 1910 extended to Missouri River points, when about 65 per cent of the coal used in Lincoln, Neb., for example, was shipped from Colorado. Today there is practically no business between Colorado mines and Nebraska, Kansas, Iowa and South Dakota. Corn is replacing coal for heating purposes not only in farm houses but in schools and other buildings."

Dealers stocked up in anticipation of a big trade last winter. The winter was one of the mildest in Colorado's history. Denver dealers, for example, have 65,000 to 75,000 tons on hand, some of which was bought during the early months of 1921 at a price averaging about $1 more than it brings today. Tightness of the money market did not hit Western states until last July, after dealers had stocked up with what proved to be high priced coal.

During October dealers feared a railroad strike, and despite their own wish in the matter, piled up more coal in their yards. The strike did not develop, but bituminous prices slumped. This came after the Colorado Fuel & Iron Co., had successfully bested the union. Mine price dropped $1. This reduction was passed along to the consumer by the retail department of that company.

This had the temporary effect of working a hardship on those operators who recognized the union and who, for the time at least, were compelled to reduce their own output, because they were unable to cope with the reduced mine price set by the Colorado Fuel & Iron Co., which produces about one-third of the Colorado output. Union leaders are endeavoring to include the 3,500 or 4,000 miners of this company in their threatened state-wide tie-up of mines next April.

Many operators feel the cut in bituminous wages and mine prices will have a salutary effect in the coal business.

Bituminous lump last January brought $6 at the mine; storage in April and May was $5.50; In June and July, $5.75, and from August to early December $6, when the Colorado Fuel & Iron Co. dropped to $5, based on a new wage scale. Miners' wages were cut from $1.02 to 78c. a ton. If market conditions permitted the miner to work as he did during the first eight months of 1921 he would be averaging from $9 to $11 a day, it is estimated. Inside day men are getting $5.25 and outside day men $4.15. Miners averaged throughout the year from $12 to $15 a day, according to reports made before the Colorado Industrial Commission. Day men for inside work got $7.75 to $8, and outside men $6.75 to $6.90.

About 500,000 tons of household coal were used in Denver in 1921 against 550,000 during 1920; 250,000 tons of small steam sizes against 300,000 in 1920, and considerably under 500,000 tons for industrial uses, against approximately 600,000 tons in 1920.

The domestic retail margin averaged $2.50, while Denver steam averaged $1.50 and car lots in country districts $1.50. These margins were about the same as those of the previous year, with the cost of business about the same and bituminous grades cut $1 in price. Bituminous retailed a year ago for $11.50 to $12; today it is $10.50 to $11. Louisville lignite dropped from $5.75 to $5.25 at the mine, and retailed at $9.25, against $10.15 late in 1920, with wages unchanged. Weld County lignite was mined at $4.50 and retailed for from $8.50 down to $6.15, against $8.90 late in 1920.

Eastern Ohio Hard Hit by "No Market" in 1921

Production 1,500,000 Tons Short of 1920 and 3,000,000 Tons Behind 1918 — Prices Slump Steadily — Normal Market Saturates Early and Other Buyers Are Hard To Find

By K. M. Pinaire

Cleveland, Ohio

EASTERN OHIO coal fields had a hazardous and unstable time of it during 1921. Production was sub-normal practically every month, the year's output falling 1,500,000 tons short of 1920 and 3,000,000 tons behind that peak year, 1918. Prices slumped steadily. "No market" was a decided hindrance to mining all the way from January to December except in the first week of November, when the region reached 76 per cent of capacity to meet a spurt of demand caused by Judge Anderson's injunction against the check-off. Many consumers feared a rail and mine strike and were stocking for it. However, this demand immediately disappeared and the next week production dropped 100,000 tons. No other week brought much cheer to the eastern Ohio market. It felt the industrial depression early and late. Markets drawing their fuel from this region were saturated during the first months, and buyers elsewhere were hard to find. The trade looks more hopefully into 1922, however.

The potential capacity of the eastern Ohio No. 8 field for the year is conservatively placed at 32,212,000 tons. The following table shows that during 1921 only 18,031,000 tons were raised and indicates the extent of production by months on the several railroads serving the district:

The production in this field in net tons, compared with the three years preceding 1921, and the prominence of the field in the annual tonnage mined in the state of Ohio is as follows:

Year	Eastern Ohio	State of Ohio	Pct.
1918	21,043,010	47,919,202	43.8
1919*	16,416,319	35,225,908	46.6
1920	19,584,806	45,227,077	43.3
1921	18,031,000	32,000,000†	56

*General strike six weeks
†Estimated.

Lack of market was the prime factor limiting production during the year just closed. The volume of mining output lost during the year because of it is estimated at 9,000,000 tons and the worktime sacrificed are:

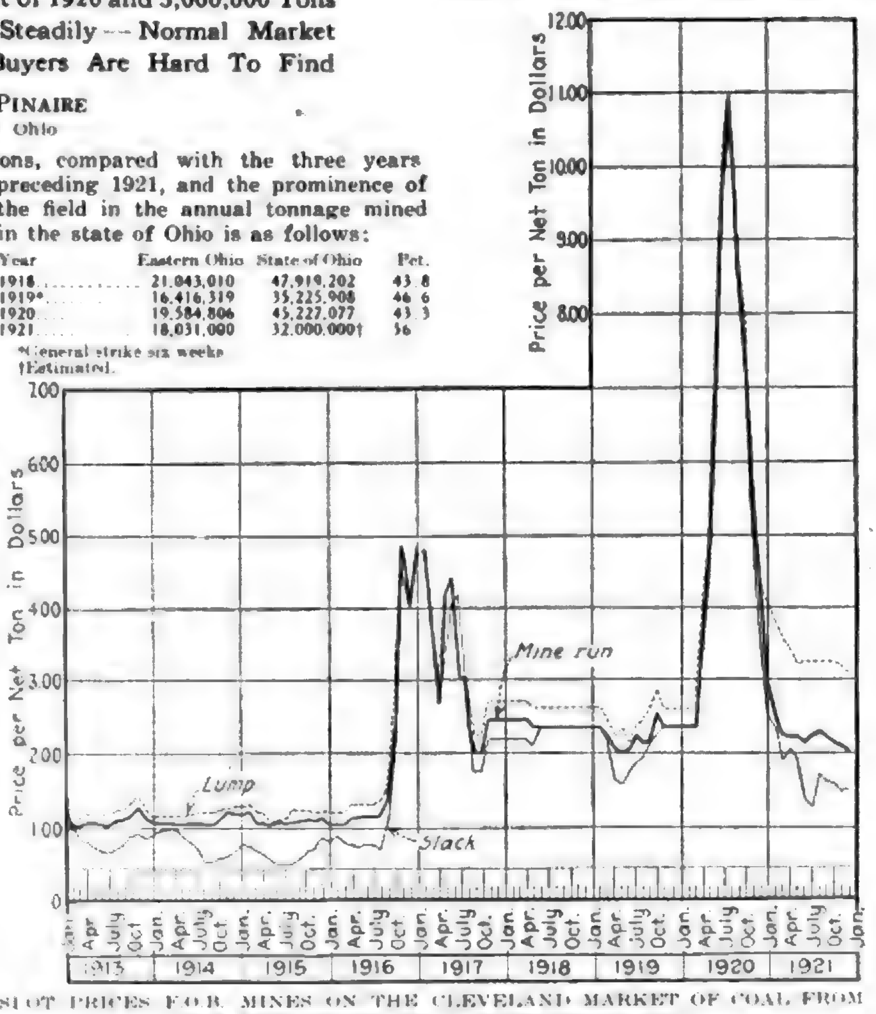
PERCENTAGE OF TIME LOST BY MONTHS DURING 1921

	Per Cent		Per Cent
January	30	July	40
February	45	August	47
March	50	September	50
April	53	October	40
May	31	November	45
June	36	December	60

Production was at its lowest ebb during the first quarter of the year prior to the season of heavy Lake shipping. As the Lake trade occupies an important position in the coal business of eastern Ohio, attention was directed to that quarter very early in the year. By the end of January reports had it that contracts for Lake coal were being negotiated at $3.50 per ton, that some mines had begun shipping Lake coal and that by the end of February 140,000 tons had been floated at Cleveland, Erie and Astabula.

But this early activity in Lake shipping did not stimulate industrial buying. By the middle of March a total of 48 freighters had taken cargoes with an aggregate tonnage floated of 400,000 tons.

Ohio shippers asked lower freight rates on Lake coal from mines to docks,



SPOT PRICES F.O.B. MINES ON THE CLEVELAND MARKET OF COAL FROM THE PITTSBURGH NO. 8 DISTRICT OF OHIO

PRODUCTION OF COAL IN EASTERN OHIO, 1921
(In Net Tons)

Railroads	B. & O.	Penna.	W. & L.E.	N. Y. C.	Totals
No. of mines	(75)	(50)	(35)	(10)	(170)
January	677,000	408,000	287,000	104,000	1,476,000
February	475,000	338,000	240,000	88,000	1,141,000
March	562,000	385,000	304,000	75,000	1,326,000
April	562,000	349,000	283,000	77,000	1,271,000
May	796,000	470,000	368,000	94,000	1,728,000
June	817,000	405,000	386,000	108,000	1,716,000
July	685,000	386,000	441,000	80,000	1,592,000
August	737,000	408,000	434,000	113,000	1,692,000
September	694,000	309,000	371,000	100,000	1,474,000
October	854,000	433,000	375,000	134,000	1,796,500
November	709,000	368,500	358,000	110,000	1,545,500
December	560,000	336,000	266,000	111,000	1,273,000
Totals	8,128,500	4,595,500	4,113,000	1,194,000	18,031,000
Percentage by Railroads	45.1	25.5	22.8	6.6	100

alleging a disadvantage of 58c. per ton on coal to the Northwest in competition with Illinois shippers, as a result a cut of 28c. per ton became effective May 4. Thereupon the output in eastern Ohio increased.

The marketing of coal in a year of general business depression has not been without its perplexities for both coal operator and retailer. By February sales forces were being enlarged and additional salesmen calling upon manufacturer and dealer. A coal-trade tour was conducted over one northern Ohio railroad in an effort to induce various consumers to lay in their supply of fuel during the time of plentiful car supply and a midsummer advertising campaign was inaugurated by retailers urging domestic consumers to fill their bins. However, barring spotty improvement, inertia continued in the trade until late summer, when the steel industry began showing signs of new life and the carriers and public utilities began entering the market for fuel.

With the exception of spot prices on slack, which reacted from the extreme low range of $1 to $1.25 per ton in June, the trend on all other grades of eastern Ohio coal was persistently downward. Because lump was prepared for Lake trade large quantities of slack came into the market when shipping was at its height and prices in the open market was quoted at $1.05 to $1.15. One large consumer was reported to have closed at that time for upward of 200,000 tons for storage at $1 per ton.

The peak of prices in the open market prevailed during the first month of the year, the top being about as follows: Slack, $2.75; mine-run, $3; ¾-inch lump, $3.25; 1¼-inch lump, $4; block, $4.50

Excepting slack lowest prices were reached in December, when spot range was about as follows: Slack, $1.75; mine-run, $1.95; ¾-inch lump, $2.15; 1¼-inch lump, $2.40; block, $2.75.

The coal industry of eastern Ohio has experienced a strenuous year, many mines being closed a greater part of the period, but relief is in sight now. Freight rates on this basic commodity may be lowered and the wage question disposed of in the not far distant future.

SPOT PRICES, F.O.B. MINES, OF BITUMINOUS COAL FROM PITTSBURGH NO. 8 DISTRICT, BY MONTHS, 1919-1921
QUOTED ON CLEVELAND, OHIO, MARKET.

	Lump	Mine Run	Screenings
1919			
January	$2.60	$2.35	$2.35
February	2.60	2.24	2.15
March	2.25	2.15	1.80
April	2.22	2.04	1.62
May	2.34	2.00	1.58
June	2.[illegible]	2.05	1.73
July	2.38	2.23	1.85
August	2.44	2.15	1.91
September	2.59	2.18	2.13
October	2.84	2.54	2.28
November	2.60	2.35	2.35
December	2.60	2.35	2.35
1920			
January	2.60	2.35	2.35
February	2.60	2.35	2.35
March	2.60	2.35	2.35
April	4.10	3.96	3.46
May	4.81	4.70	4.46
June	7.50	7.40	6.87
July	10.00	9.75	9.56
August	11.00	11.00	10.50
September	9.00	8.71	8.68
October	7.81	7.58	7.25
November	5.85	5.41	5.05
December	4.28	4.25	3.00
1921			
January	4.04	2.94	2.50
February	3.[illegible]	2.46	2.34
March	3.59	2.26	1.90
April	3.47	2.24	2.06
May	3.23	2.33	1.90
June	3.25	2.16	1.36
July	3.25	2.21	1.28
August	3.25	2.30	1.71
September	3.25	2.21	1.61
October	3.25	2.15	1.58
November	3.22	2.10	1.48
December	3.10	2.03	1.50

Milwaukee Got More Coal Last Year Than in 1920 But Was Unable to Sell It

Wholesalers Who Fought for 1920 Deliveries Are Now Glad They Didn't Win—Buyers Await Further Price Drop—Coal Men Watch Weather, Freight Rates and Miners' Wages

By H. Bleyer
Milwaukee, Wis.

THE business of marketing coal at Milwaukee during the calendar year 1921 was not up to the usual volume because of a combination of mild weather, industrial depression and unemployment. Total receipts here were 55,816 tons above 1920, so that yard stocks now are tremendous, though docks are not overloaded.

The old truism "It is an illwind that blows nobody good" was exemplified to the satisfaction of coal wholesalers here. Many were unsuccessful in getting as much coal as was desired during the shipping season of 1920, despite strenuous efforts. They were saved from financial loss because of the mild winter which followed. As it was, several hundred thousand tons of bituminous coal were carried over into the season just closed, upon which the owners had to suffer a material reduction in price.

Bituminous coal showed a marked decline in price over 1920, but not as much as buyers expected. The drop was restricted by high rail rates and the fixed scale of miners' wages. Anthracite held steady throughout the season, notwithstanding a constant clamor for price cuts. Sales and deliveries for the first six months of the coal year—April 1 to Oct. 1—were slow. Industrial plants ran low, and consumption of soft coal fell off heavily. Various industries which had heretofore maintained a steady flow of coal, thus accumulating stock piles, discontinued the practice and simply ordered enough to supply immediate needs. Buyers of anthracite coal likewise held back because of high prices, in the hope that something would turn up which would cause a drop. Then again, many consumers were out of employment and without means of providing for their winter requirements in advance. For the same reasons dealers in the interior cities failed to fill up their yards, as had been their custom in the past.

The close of the shipping season of 1921 finds the yards full to overflowing with both anthracite and bituminous coal. E. H. Uhrig, president of the Milwaukee Western Fuel Co., considers the stock of coal on hand at present

RECEIPTS OF COAL AT MILWAUKEE BY MONTHS IN 1921
(In Net Tons)

Month	By Vessel Hard	By Vessel Soft	By Car-Ferry Hard	By Car-Ferry Soft	By Rail Hard	By Rail Soft	Grand Total
January	....	....	3,029	28,985	41	78,879	110,934
February	....	....	9,450	25,685	118	71,241	106,494
March	....	....	32,319	27,867	....	46,194	106,380
April	43,100	154,579	10,570	27,338	....	39,121	274,708
May	213,665	487,751	5,551	15,749	50	72,521	795,287
June	135,435	524,840	9,040	11,702	50	42,041	723,108
July	110,958	348,123	10,320	13,052	632	29,804	512,889
August	142,072	330,887	15,387	14,468	1,263	60,401	564,478
September	102,492	183,692	9,473	25,916	....	55,586	377,159
October	108,028	289,544	12,370	27,436	1,090	108,610	547,078
November	109,927	247,638	15,827	19,635	....	81,305	474,352
December	56,968	7,000	8,135	15,934	*95	*84,569	172,701
Total	1,022,645	2,574,074	141,471	253,767	3,339	770,272	4,765,566
Total, 1920	873,003	2,375,979	90,174	315,632	5,058	1,049,906	4,709,752
Increase	149,642	198,095	51,297				55,816
Decrease			....	61,865	1,719	279,634	....

* Estimated.

RECEIPTS OF COAL AT MILWAUKEE

	1920	1921	Increase	Decrease
Cargo, hard	873,003	1,022,645	149,642	......
Cargo, soft	2,375,979	2,574,074	198,095	......
Carferry, hard	90,174	141,471	51,297	......
Carferry, soft	315,632	253,767	......	61,865
Rail, hard	5,058	1,049,906	......	1,719
Rail, soft	3,339	770,272	......	279,634
	4,709,752	4,765,568		

as ample, but says happenings during the next three months may bring about a marked change.

Should the winter, as it advances, prove to be exceptionally cold, there is a possibility of a scarcity of coal, due to the fact that the so-called buyers' strike prevented the dock men from obtaining as much coal as they desired. They lacked storage room, because coal did not move out by rail as fast as it came in by lake.

In view of the uncertain conditions which were experienced during the last two years it is impossible to get anybody to make a prediction as to the business of 1922. Freight rates, miners' wages and the weather are difficult to conjure with. The coal man has stopped guessing, and has made his mind up to take things as they come.

Receipts of cargo coal, both hard and soft, and of hard coal by car ferry were noticeably larger than in 1920 but rail receipts fell off. The grand total, however, is 55,816 tons above 1920.

High-Volatile Field Produces Coal Under Fire

Despite Guerilla War, Logan and Mingo Counties Produce Heavily to Meet Contracts—Much West Virginia and Northeastern Kentucky Fuel Pushed West Into Competitive Markets

J. W. Weir
Elkins, W. Va.

SOUTHERN West Virginia, northeastern Kentucky and Virginia found a poor market for their high-volatile coal during 1921. Freight rates to tidewater were prohibitively high and anyway there was little chance to sell abroad, so practically no coal moved eastward. For these reasons the product of this field competed in the West with other West Virginia and Kentucky districts.

Despite all obstacles the Logan field eclipsed all previous output records. It produced over 10,000,000 tons. Other sections were low. Unorganized fields never passed the 50 per cent mark. Car supply, however, was good.

High-volatile fuel steadily declined in price throughout the year. At no time was prepared quoted in excess of $4 a ton. Much of the time the price averaged between $3 and $3.50. It was during May and June that prices became somewhat firm. The British coal strike was on then. Prices also hardened on prepared the latter part of September, when a railroad strike threatened and there was much strike talk among miners. A rush of orders came for prepared and shipments were heavy for a time, but the reaction came later and during the last quarter of 1921, notwithstanding the fact that colder weather had set in, prepared became a drug on the market.

In a sense the Lakes proved the salvation of the high-volatile regions of southern West Virginia and northeastern Kentucky. Shipments originating in those areas were heavy as long as lake navigation was possible. The general movement of West Virginia coal into Western markets was of more than passing significance, for during the war West Virginia coals were to a great extent zoned out of the West, and for a year or two after the war there was a much heavier eastern movement than was witnessed in 1921. West Virginia and northeastern Kentucky producers realized that they must look to Western outlets for their coal and opened agencies there.

The year saw little change in the labor status of any of the fields in the Middle Appalachian high-volatile area although there were frequent labor disturbances during the year growing out of the effort of the United Mine Workers to extend their influence into non-union territory, these disturbances assuming formidable proportions late in August, when the uprising of miners and the attempted invasion of Logan and Mingo counties occurred. Throughout the year, however, the operators of the Logan and Mingo fields continued to operate their mines on a non-union basis and the Kanawha operators continued to operate their mines on a union basis. The northeastern Kentucky field maintained its open-shop status.

Owing to declining prices the point was reached long before the end of the year where operators in non-union territory either had to shut down or cut wages. They cut. Operators in the union territory could not do this because the United Mine Workers insisted upon the 1920 wage agreement. Therefore many of them closed their properties.

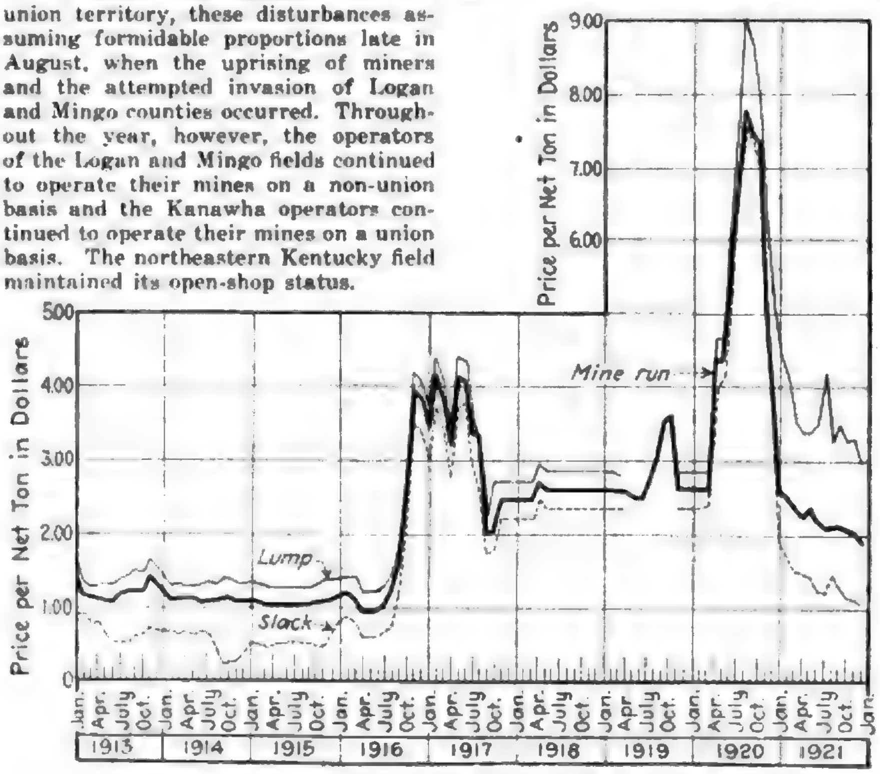
The first three months of 1921 in the Logan district of West Virginia saw a market that discouraged production. The output was less than for the corresponding period of 1915. In April, however, production was slightly increased. May say a big increase and during June and July production remained high. Slight decreases occurred in August and September, but the output jumped to over a million tons in October and November. December production was estimated at slightly over 750,000 tons.

The 1921 monthly production record for the Logan district was:

January	661,710	July	1,018,950
February	479,930	August	819,700
March	614,090	September	939,910
April	772,920	October	1,175,600
May	1,048,640	November	1,011,850
June	1,195,780	December	*776,457

*Estimated.

Similar to other fields, the Logan district has felt the slackening of the tidewater market, but not to such an extent as those fields to the east. At least 70 per cent of Logan's coal went West with a great part of this moving to the Lakes. The balance was sent eastward or was loaded as railroad fuel. The Chesapeake & Ohio has attempted to serve the field to the best of its ability and, with the exception of one month, maintained a 100 per cent car supply. The shortage of



SPOT PRICES F.O.B. MINES ON THE COLUMBUS MARKET OF COAL FROM THE KANAWHA FIELD equipment at that time was due to a heavy western movement, congesting the western gateways.

Car rating of the mines in the Logan region was increased slightly owing to the plentiful supply of labor. The field is now in a position to serve both large and small consumers.

In the Kanawha field the year 1921 deserved to rank as one of the poorest in history. From the very outset of the year there was a greatly restricted output and as the year advanced the market slumped and production grew more limited. The bulk of the coal from this field was shipped West. During the last two months of 1921 idleness was pronounced. Production was not over 10,000 tons a day. Nearly all the mines in this field are operated under a union contract so it was not possible to reduce wages. By the middle of the year mine-run was down to $2.25, when production costs ranged from $2.25 to $2.65. By the end of the year it reached $1.25 a ton and prepared was offered at $2.25. It was possible to obtain a little more business and to speed up production somewhat during the latter part of September and the first part of October.

The status of labor remained the same in this field until late in August, when thousands of miners from the Kanawha field tried to invade Logan County. Federal troops quelled the disturbance. Mining almost stopped.

In the Mingo field trouble lasted through the first half of the year, yet the mines in that field managed to produce between 75,000 and 100,000 tons of coal every week.

Heavy tonnage from the Mingo field also moved West, though a fairly large percentage of the coal from this region was utilized by the Norfolk & Western and other railroads. Maintenance of production was due to the large tonnage under contract. Even at the end of 1921, when idleness was very marked in other fields, it was possible to produce 75,000 tons a week although at the same time no market's losses were running as high as 150,000 tons.

Production in the Northeast Kentucky Coal Association territory, known as the Big Sandy district of Kentucky, was decidedly below normal last year. The greater part of the coal produced in this district is the famous Elkhorn Byproduct, Miller's Creek Block and Yellow Jacket coals. It is safe to say that at least 75 per cent of the loss of production can be attributed to "no market" conditions. Production for the entire year probably will show from 20 to 23 per cent of full time.

The new through rate in effect to Newport News for transshipment beyond the Capes opens the export and coastwise market to the coal of this district. This undoubtedly will aid in large measure in stimulating production with a return of normal business.

In northeastern Kentucky there is a general feeling of optimism, but many operators of southern West Virginia look for no improvement in the coal business before next autumn.

Bad as the year was for southwestern Virginia, that field did not suffer as a majority of the coal fields of the country did. During only a few weeks did production fall under 50 per cent of 1920 figures, when a little over 10,000,000 tons were produced. It is estimated that production for 1921 was about 6,000,000 tons, or 60 per cent of 1920. Coke production for 1920 was a little more than 1,000,000 tons and for 1921 it will not exceed 25 per cent of that.

There was no labor disturbance of any character during the year recently closed. This field is a non-union one. Good feeling prevails between labor and operators. A majority of the miners in this field are native born. Not more than 5 per cent and certainly not exceeding 10 per cent are foreigners.

While operators in this field hesitate about predicting for the future, there is no doubt that more coal has been consumed during the last sixty days than has been produced, so there should be far less coal in storage than on Nov. 1 and demand should appear soon.

Byproduct Coke Ovens Surpass Beehives

Ratio of Output During 1921 Is About 88 to 12, Though Capacities Are Fifty-Fifty — Coke Prices Flounder Down to $2.75 but Stiffen as New Year Opens

By B. E. V. Luty

In July, 1921, when blast-furnace operations in the United States were at the lowest point for many years, the production of coke, according to the reports of the U. S. Geological Survey, was 12 per cent beehive and 88 per cent byproduct. The existing coking capacity is approximately one-half beehive and one-half byproduct. The surviving beehive ovens apparently exist for the purpose of taking the peak off the load in coke demand. When the requirements are light, beehive production decreases more than byproduct production.

The working out of this general principle is seen most clearly in the case of the United States Steel Corporation. With its subsidiary the H. C. Frick Coke Co. it is by far the largest coke-producing interest in the Connellsville region. At the same time the corporation has large byproduct coking plants distributed at practically all of its blast furnaces. For four months or more in 1921 the Frick company did not operate a single oven in the Connellsville region.

The region as a whole (Connellsville and Lower Connellsville), according to the weekly reports of the Connellsville *Courier*, dropped to a rate of production of about 20,000 tons a week in the latter part of July. Years ago the region had produced more than 400,000 tons a week. The region's output for the year, as reported by the *Courier*, was 3,572,417 tons, while approximately 20,000,000 tons had been produced in three years, 1906, 1912 and 1913.

However, the Connellsville region did not suffer as much as did many other industries in 1921. For one thing, the region sold much coal to the byproduct ovens that were taking the place of its own beehive ovens and on account of the high cost of producing coal at union mines it had a large trade in steam coal and in medium-grade gas coal.

The year opened with wages in the Connellsville region at the Frick scale of Sept. 1, 1920. This scale, making allowance for difference in mining conditions, parallels the union scale. The price of coke had been on the toboggan for some time and was not at the bottom. Spot furnace coke had sold at $18 to $19 in July and August, 1920, and had just passed under $8 at the close of the year.

The full extent of the liquidation that was in store for the iron and steel industry was not realized by the Connellsville coke operators. Contracts had been made for coke for 1921 delivery that proved not worth the paper they were written on. It was impossible for the furnaces involved to run. Coke costs were too high. Coke prices continued to decline and by April 1 or earlier the independent operators in the region began reducing wages in an effort to get a cost that would enable them to interest buyers.

May 16 the Frick scale was reduced, but soon independents began making additional reductions, thus culminating in the independent scale of July 1, with a pick-mining rate of $2.06 per 100 bu., against $2.65 in the Frick scale of May 16 and $3.24 in the general scale of Sept. 1, 1920. Aug. 1 the Frick scale was reduced the second time, with a mining rate of $2.38. Not content with their scale of July 1, although it was below even the newly reduced Frick scale, some operators in August undertook to make a further reduction. This caused so much trouble that about Sept. 1 the independents, instead of making a further reduction, advanced to the Frick scale.

Coke prices were thoroughly liquidated by the beginning of July when spot furnace coke sold at $3 and less. When wages were advanced later the market stiffened somewhat, but at the close of the year it was down again, the year closing with spot furnace coke at $2.75@$3, while the lowest price quotable on first quarter contracts was $3.95.

Cut in Coal Freights, Morrow Thinks, Would Increase Rail Traffic and Reduce Operating Expense

BY PAUL WOOTON
Washington Correspondent of COAL AGE

NO NEW arguments were brought forward by the carriers last week in the oral presentation of their case before the Interstate Commerce Commission, which has under consideration the subject of a general rate reduction. A considerable portion of the time has been taken up in reading and explaining statistical data contained in the various exhibits submitted by the carriers. Practically all of the discussion has been general, coal being mentioned only incidentally. Daniel Willard attempted to show that the Baltimore & Ohio under no conditions could stand a 10 per cent reduction in coal rate, but his calculations were in error and the corrections as to some of his conclusions were submitted the following day. It was brought out that the average revenue derived from coal transportation was $2.27 per ton.

The examination of the carriers' witnesses was particularly weak. Due to the failure of the Senate to confirm Commissioners Aitchison and Hall, this entire proceeding—one of the most important in the history of the Commission—is being conducted by Commissioners Esch and Lewis. Due to the short time that the latter commissioners have been in office, their knowledge of the intricacies of the situation naturally is limited. It would not be surprising if considerable delay results before the confirmation of Commissioners Hall and Aitchison, since a very determined fight is being made in the Senate on the ground that the South is not represented on the Commission.

WHY N. C. A. FAVORS RATE REDUCTIONS

When J. D. A. Morrow, vice-president of the National Coal Association, takes the stand in the rate-reduction case, now being heard by the Interstate Commerce Commission, he will endeavor to show that the two thousand members of the National Coal Association, who produce 60 per cent of the country's bituminous coal output, believe that material reductions in the freight rates on bituminous coal would increase the traffic of the carriers and reduce their operating expense. He will take the position that a considerable reduction in the carrying charges of bituminous coal is necessary to a general revival of business and industry, upon which the carriers must depend for increased revenue. He expects to be able to prove that the railroads' fuel bill has been reduced to the point where that saving alone will more than offset the loss in revenue which would result from a substantial reduction in the rate on coal. The point will be emphasized that the National Coal Association does not urge a general reduction in the rates upon all classes of freight. The position of the association is that bituminous coal is so vital to the economic life of the nation as to deserve special consideration by the commission. Incidental to this contention he will point out that the bituminous coal industry pays $50,000,000 in freight bills on other commodities.

The point will be emphasized that the National Coal Association is anxious that the carriers receive a fair and adequate return, not only because such a return is just to them but because it is essential to the general prosperity and welfare of the country. Mr. Morrow will call attention to the fact that the prosperity of the carriers is of particular importance to the bituminous coal industry because the railroads constitute its largest customer, and because adequate transportation facilities and service are particularly essential to the bituminous coal business. In that connection Mr. Morrow's remarks to the commission will be in substance as follows:

While the National Coal Association sincerely desires the financial position of the railways to be preserved, it is firmly convinced that substantial reductions in bituminous coal freight rates are a prerequisite to industrial and business revival in the United States. Upon this the prosperity of the carriers as well as the nation at large, in the last analysis, must depend. They are convinced that a material reduction in bituminous coal rates will act as a stimulus to business and will tend to increase the revenues, reduce the operating expenses of the carriers and add to their net return rather than diminish that return. The facts which lead to that conclusion apply with particular force to this basic commodity which enters so generally into the economic and social well-being of the nation, and the entire propriety of substantial nationwide reductions in the present level of bituminous coal rates will be urged upon the commission.

Other points which will be made by Mr. Morrow in the course of his argument will be along the following line:

American industry has been built on cheap power and fuel. Before the war the United States had all of the advantages which go with the availability of coal at a lower price than coal could be delivered at the factories of any other important commercial nation. The cost of bituminous coal f.o.b. mines to industrial consumers then ranged from 90c. to $1.50 per ton. That coal was moved to factories on low freight rates. Tremendous quantities moved on short hauls at nominal transportation cost. Manufacturers now feel that lower costs of coal at their plants are necessary to the re-establishment of normal production conditions in their plants. Low-cost coal at our factories is the very cornerstone of a normal business.

Any material reduction in the delivered costs of bituminous coal in the immediate future must come chiefly from nationwide reductions in freight rates. The mine operator has no profit which he can reduce in an effort to lower the cost of coal to the consumer.

LABOR IS LARGEST ELEMENT OF BITUMINOUS COST

The largest single element in the cost of bituminous coal is labor. It may be argued that wages should be reduced so as to make coal available at a lower price. Wages have been reduced to the approximate level of November, 1917, throughout the districts which are not controlled by the United Mine Workers. A similar reduction has been put into effect in some of the union fields. In the remaining fields it is safe to say that wages will be reduced on April 1. These coming wage reductions in the union fields, however, already have been discounted to some extent in the present price of coal.

According to the market reports of *Coal Age*, the average price of coal in the United States today is $2.13 per ton. This is 46c. below the average price for the United States fixed by the U. S. Fuel Administration on a wage scale approximating that now in effect in the non-union fields, and much below the scale now paid in the union fields. The competition of non-union coal has necessitated reductions in the current price of coal in the union districts. The higher-cost mines in each district are closed. Thus the unionized fields, although they are continuing to carry out their government-made wage contract and are paying those high wages to their men, have seen the price of coal set by the competition of the producers of other districts in which wages have been reduced. Bituminous coal mines, like the railways, cannot operate permanently at a loss. Capital invested in coal mines must enjoy a reasonable and adequate return. At present this industry, as a whole, is running at a loss.

With the average freight charge on bituminous coal $2.27 per ton, with mine prices down to an average of $2.13 per ton, with no profit left the operator, with wage reductions already largely discounted, it is obvious that so far as the delivered cost of coal to the industrial consumer is concerned, any material reductions in the immediate future must come chiefly from cuts in the freight rates.

Coal freight reductions will accrue to the direct financial benefit of coal consumers. Approximately 85 per cent of all bituminous coal is sold f.o.b. mines and the consumer himself pays the freight. This applies to nearly all coal which goes into industrial consumption. The domestic consumer can rely upon competition to insure his getting the benefit of reductions in freights. With the competitive situation in this industry as it is today it is certain that freight reductions will go through to the domestic consumer, as well as to the industrial user.

An average reduction of 60c. per ton on bituminous coal for example, would release nearly $1,000,000 a day to be spent in other ways. Such an addition to the daily purchasing power of the people in itself would be a powerful stimulus to business revival. A lower level of rail rates combined with wage reductions in the spring would establish confidence in the stability of a lower level of fuel and power costs. Uncertainty as to the future delivered cost of bituminous coal is one of the important factors holding back the resumption of industrial enterprise.

Our overseas coal exports have almost disappeared in the last few months. Rate reductions would have an important bearing on the export coal trade. In an effort to hold foreign business, drastic reductions have been made in prices. In some instances only a few cents per ton have been received for the coal at the mine. Vessels can be chartered for the bare expense of operation. Thus the overseas business depends absolutely upon a heavy reduction in the rates to tidewater.

A reduction in rates would mean a large saving to many railroads, such as the New England carriers, which have no coal mines on their lines. Such roads use nearly fifty million tons of coal annually. The lower fuel cost would be reflected in the price the railroads are compelled to pay for the materials, supplies and equipment which they buy.

Increase in freight rates on a commodity like coal has a far different result than with similar increases on manufactured products. The consumer of coal looks at the heavy increase in the transportation charge in a wholly different way than does the prospective buyer of a motor car. Even though the freight rate doubled on motor cars it probably would mean the addition of only $20 in the total cost of the car to the average purchaser. The freight rate does not constitute a sufficient percentage of the total value of the article to interfere with its purchase.

The reduction in the price of bituminous coal to the carriers probably will average during 1922 about $1 per ton less than in 1921. If the production of bituminous coal in 1922 should aggregate 450,000,000 tons, and if the carriers took the usual percentage of that output, 125,000,000 tons, the direct reduction in the cost of operations would aggregate $125,000,000. Assuming that 85,000,000 tons of this fuel coal will be used by carriers which originate coal tonnage and upon which they will pay no freight, we will have left 365,000,000 tons of coal on which freight will be paid in 1922. If that entire $125,000,000 saving in the cost of their fuel were devoted to a reduction in the freight rates on the 365,000,000 tons remaining, it would permit an average reduction in freight rates of 37c. per ton. A reduction in freight rates on that 365,000,000 tons, however, would include a reduction on at least 40,000,000 tons of coal used by the non-originating coal carriers, thus making possible a much greater reduction per ton. The savings which the carriers could make in their operating expenses through the lower cost of coal would in itself permit of a substantial reduction in their rates on coal without any loss of revenue whatever to the carriers as a whole.

The argument of George Cushing, managing director of the American Wholesale Coal Association, for reductions in coal freight rates to be presented before the Interstate Commerce Commission, will be reviewed in *Coal Age* next week, Jan. 26.

Opens Bids for Coal for Ohio Institutions

BIDS for coal for state institutions of Ohio opened Jan. 4 by the Ohio Board of Purchase were as follows: Columbus State Hospital, Columbus—11,000 tons Hocking mine-run, Wayne Coal Co., $3.50; same nut, pea and slack, $3.10, delivered on switch.

Ohio Penitentiary, Columbus—9,000 tons Hocking mine-run, Lexis Coal Co., Columbus, $3.30; same nut, pea and slack, Wayne Coal Co., $3.10.

State House and Grounds, Columbus—1,300 tons Hocking mine-run, Essex Coal Co., Columbus, $3.45; same nut, pea and slack, Wayne Coal Co., $3.10.

Longview Hospital, Carthage—3,500 tons Pocahontas mine-run, General Hocking Coal & Fuel Co., Columbus, $4.43.

Government Takes a Hand in Effort to Avert Strike of Coal Miners

EVERY possible effort is to be made by the government to prevent a coal strike in the spring when the coal wage agreements expire. This means that the President and his Cabinet members will exert all possible influences to have the operators and miners get together and adjust the new wage schedules. Secretary Hoover already has conferred with railroad operators and brotherhoods and with John L. Lewis, president of the United Mine Workers. It is expected that the operators will desire reduced wages, while the miners probably will insist on maintenance of the present scales, if not an increase.

The government hopes that production will not cease pending settlement of the wage question and that the settlement will be mutually acceptable on both sides with no ill feeling displayed. It was stated at the White House on Friday, Jan. 13, that several members of the administration, meaning, of course, the Cabinet members, had been particularly interested in discussion and activities looking toward an early settlement. It was said that the administration's activities in this connection will be centered under Secretary of Commerce Hoover, with Secretary of Labor Davis preparing all possible data bearing on wages.

The Department of Labor is taking advantage of the time intervening before coal wage negotiations begin to assemble this data on wages and conditions. Hywel Davis, one of the members of the department's conciliation service, who was formerly president of the Kentucky Coal Operators' Association, has been assigned by the department to collect it. In addition the department has instructed all of its conciliators to furnish information they may be able to obtain as to wages and conditions of employment.

Urges Adoption of Fuel Yard Contract of All Government Departments

RECOMMENDATION that all departments of the government adopt, with certain modifications, the form of contract now used by the Government Fuel Yards, for the purchase of their coal requirements, is made by the committee on the Government Form of Coal Contract of the National Coal Association, consisting of G. W. Reed, of Chicago, vice-president of the Peabody Coal Co., chairman; Thomas F. Farrell, of New York, vice-president of the Pocahontas Fuel Co., and John S. Brydon, of Somerset, Pa., president of the Quemahoning Coal Co.

Among other things, the committee recommends modification of clause 20, giving the government the right to terminate contracts and that part of clause 9 covering increase or decrease in the price be modified, specifying particulars. Coal purchases for battleships, is excepted from recommendations, on the ground that the rate of shipment of coal intended for such use cannot be forecast with accuracy.

The suggested changes in the form of contract used by the Government Fuel Yards will, in the opinion of the committee, meet with the approval of bidders on government fuel. In this connection the committee calls attention to certain "undesirable and dangerous" features, from the standpoint of the producer and seller, in the form of contract now in use by some of the government departments, which, it states, result in the loss to the government of advantages in price, service and quality which its credit should attract.

The committee's report has been submitted to F. E. Wadleigh, head of the coal section of the Bureau of Foreign and Domestic Commerce, in response to his request that it make a study of the subject.

Watkins Urges Westmoreland Operators to Join National Coal Association

COAL operators in the Westmoreland non-union field were urged to join the National Coal Association in an address given Saturday, Jan. 14, before the Westmoreland Coal Club at Greensburg, Pa., by Thomas H. Watkins, President of the Pennsylvania Coal & Coke Corporation. The association, which he announced is soon to change its name to the National Association of Bituminous Coal Producers, spoke for the coal industry during the war and is the logical spokesman now. It can protect the industry as it did when it helped prevent the Federal Trade Commission interfering unnecessarily with the trade, and has performed many other valuable services, including the design of an accounting system which will save many a coal man from bankruptcy.

In touching upon problems of the industry today, Mr. Watkins declared that employers of non-union mine labor are directly interested in the impending conflict between the United Mine Workers and union operators.

The only protection this country has today, he said, "lies in the fact that the non-union mines of Pennsylvania, West Virginia, Alabama and a few small outlying sections" are in position to produce a substantial portion of the soft coal this country needs. The country owes "a debt of gratitude" to the operators in these fields, Mr. Watkins said, for "maintaining through bitter struggles and hard trials their right to employ labor on such terms as may be agreed upon without the influence of the professional labor leader.

"The right of labor to organize is not denied, but when once organized, it must, and will, in time be forced to recognize the obligations that in the end follow every aggregation of capital, labor, or other group which attempts to usurp power to the detriment of other classes of society." The miners' union by refusing to recognize present conditions and to carry its share of the burden of deflation, he said, has "ceased to be an organization with which either the public or the operators can continue to deal."

Mr. Watkins did not hesitate to say that government intervention in a strike, if one occur, would be a failure, if it followed the policy of the President's Bituminous Coal Commission of 1920, which attempted "to fasten upon one group of men a contract which leaves the other free to act" as they like. Particularly significant was his statement that no group of operators without "committing financial suicide or without betraying the interests of their customers and the public" could agree in advance to abide by the awards of any future commission that does not leave each district on an equitable, fairly competitive basis," free to meet fair competition from other producing districts.

"It is not wise" Mr. Watkins declared, "for operators, union or non-union, to take advantage of the situation which exists at this moment to push labor too far or to reduce wages below a reasonable standard; the reactions from such unwise practice might be detrimental to all. If labor leaders are blind to their responsibilities to the rest of society that is no reason why we should be blind to our responsibility to our employees." Arguing that labor will have a leader and that the employer, not the professional agitator, is the natural leader, he said it was evident that the employer should devote his time and thought to new methods that promise less strife and more co-operation.

Howat's Removal from Office Approved

A TEMPORARY restraining order was served early in December on John L. Lewis, international president of the United Mine Workers of America, forbidding him from acting on his order removing from office Alexander Howat, president of the Kansas district. Judge Samuel A. Dew, of the Jackson County Circuit Court, of Missouri, refused on Jan. 14 to make the injunction permanent, holding that the Howat board had ignored the committee of Lewis' appointment when that committee advised that work be resumed pending arbitration. The officers had also ignored recommendations of the International Executive Board that the district officers order the mine workers to discontinue the strike.

Judge Dew said: "The evidence shows that the plaintiff, Howat, publicly stated that as long as he remained in jail he hoped no coal would be dug nor until the Industrial Court law of Kansas was repealed. The plaintiffs, defying the existing law and courts of a sister state with one hand, appeal to the law and tribunals of Missouri with the other," the order continued. "No man or set of men can violate and defy the Kansas laws and at the same time get relief from the courts of equity of a sister state."

The operating contracts, the Court asserted, contain "several plain provisions prohibiting any and all cessations of work pending arbitration of grievances," adding that this is "just as binding on the miners as on the mine owners."

Over Three Hundred Indictments in Logan; Troopers Serving Warrants Are Shot

FRANK KEENEY, president of district No. 17; Fred Mooney, secretary-treasurer of that district; William Blizzard, president of Subdistrict No. 4, and A. C. Porter, secretary of Subdistrict No. 2, were indicted on Jan. 13 by the Grand Jury of Logan County on a charge of treason. About 300 indictments in all were openly returned, but there are other indictments for treason where the names of the defendants are not made public, as the men have not been arrested.

The treason alleged is the attempt to overthrow Governor Morgan's proclamation of martial law in Mingo County and the raising of an army against the State of West Virginia and other acts prejudicial to the safety and welfare of the state. Keeney, Mooney and Blizzard are among ninety men being held in the county jail of Logan County on charges of conspiracy and of aiding, abetting and counseling Frank Kitchin in the alleged killing of John Gore, a Logan County deputy sheriff at the battle of Blair Mountain, where the armed march was stopped.

When the troopers of the State Constabulary attempted on Jan. 15 at Dry Branch, Cabin Creek, to arrest a miner on a Logan County capias two of them were shot and seriously wounded, the shooting being done, it is said, by two relatives of the miner. The arrested man got away, and forty troopers were started on a hunt for the men.

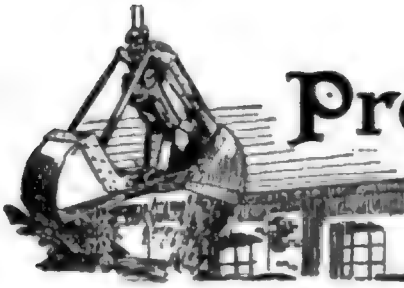
Deprecates Delay in Reading Dissolution

SOLICITOR General Beck, on behalf of the government, has requested the Supreme Court to affirm the dissolution decree in the Reading coal case handed down by the District Court for the Eastern District of Pennsylvania. He says the decree should not be disturbed by a small minority of stockholders on the narrow question of technical right as between different classes of stockholders. The same court action has been asked by W. B. and Madge F. Kurtz, holders of preferred stock in the Reading Coal Co., by Adrian Iselin and others as a committee representing certain first and second preferred stockholders, and by Joseph E. Widener and the Reading Company.

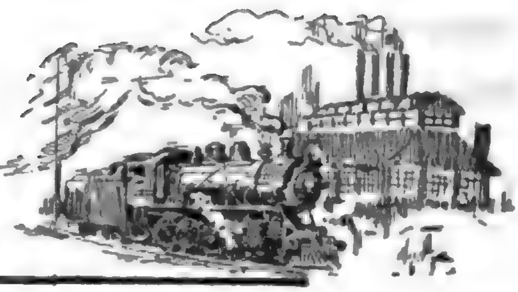
Twenty Acres Cave In at Glen Alden Mine

THREE men were entombed and as many more were injured and others had narrow escapes from death when a twenty-acre section of the Glen Alden Coal Co.'s National mine at Scranton, Pa., caved in on Jan. 13. The area thus affected was known as the Devil's Eyebrow. It appears that thirty-five men were at work in the section at the time and that the area being worked was one of those old badly gutted areas with weak pillars often found in old mines. Another company had worked this area fifty years ago.

As it lay about 150 ft. below the surface the injury done to the surface buildings was not as severe as would have been the case had the seam had shallower cover. Cracks to the surface were formed, however, it is alleged, and much consternation resulted, as further caving was feared. In the mine the fall created a severe air blast which sent dust up the shaft. On Jan. 15 the bodies of the three men had not been recovered though a hundred men were engaged in attempting their rescue.



Production and the Market



Weekly Review

SIGNS of the anticipated buying movement against a possible coal strike this spring are beginning to appear. Throwing off the holiday sluggishness, industries are again getting into operation, but with little increased speed. This slow improvement, coupled with a decided tendency to make overtures for future requirements, has halted the decline in bituminous production and prices.

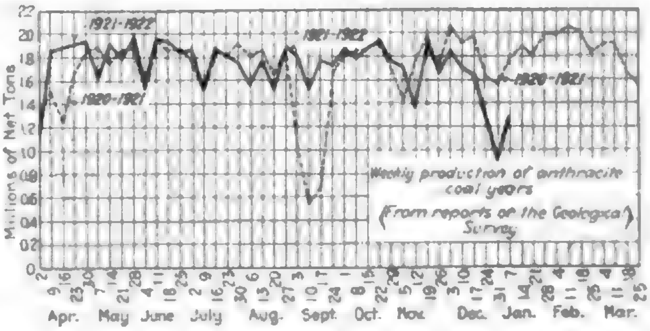
The stock pile is being left more or less undisturbed and current needs are being largely supplied from the spot market. The removal of the transportation tax and the present extremely good values offering have about convinced buyers that prices will not be much lower, at least until a wage readjustment is made. However, the urgency of fuel requirements is not yet manifesting itself to the extent of any sharp turn for the better.

IMPROVEMENT IN IRON AND STEEL ENCOURAGES

Another encouraging factor is the recent upturn in iron and steel. Orders from railroads and other sources have caused an upward revision of the April 1 estimate of activities in the steel trade. A month ago 60 per cent was the figure given by conservative leaders in the steel industry. Developments since then have caused these same authorities to increase this estimate to 70 per cent. Buying of coal by all industries has been so low since last October that any material expansion of activities will at once bring buyers back into the market.

The new year has brought about a crop of failures in the wholesale trade. Several consolidations have also taken place. The elimination of some bargain-lot wholesalers is of distinct benefit to the responsible members of the trade and the grouping of important interests should help the industry in times like these when increased financial facilities enable a better line of credit.

Anthracite producers are finding a better market, as colder weather has aided retail distribution. Some idle collieries have resumed work and independent quotations have stiffened slightly. However, retailers are still rather well stocked and their replacement orders are below normal.

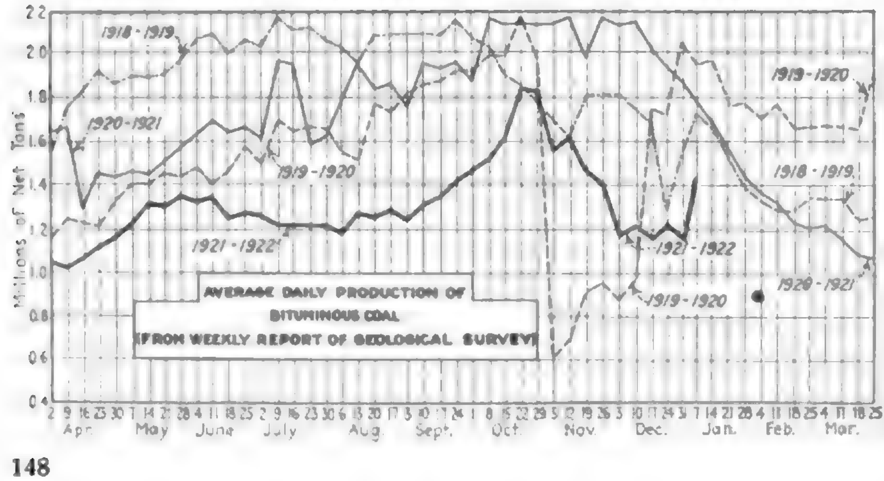


Coke consumers have apparently satisfied their contract requirements for the first quarter, as that market has softened. Spot tonnage is stiffer due to the low production and the two markets are thus being brought into more natural alignment.

BITUMINOUS

Production was greatly improved during the first week of January. The total output was 7,460,000 tons, according to the Geological Survey, as compared with 5,996,000 tons the week preceding, the daily output increasing from 1,199,000 to 1,437,000 tons. Loadings on the first two days of last week—Jan. 9-10—indicate a further increase for that period.

Non-union mines, with their lower costs, are of course getting the bulk of the competitive business offering. At the present prices, it is realized that much of the coal from organized fields is going at figures very near, if not below production costs. Consequently, the next step in the process of general readjustment is the reduction in union wage scales. Many union operators are actually running at a loss in the meantime, justifying their action by a determination to retain old customers at any cost until their wage scales shall have been pared down to allow a profit. The necessity for relief is growing daily and April 1 will certainly see operators ready to insist on a wage cut.



Estimates of Production

(Net Tons)

BITUMINOUS COAL

Week Ended	Production	Average per working day
Dec. 24, 1921	7,468,000	1,245,000
Dec. 31, 1921 (b)	5,996,000	1,199,000
Jan. 7, 1922 (a)	7,460,000	1,437,000
Calendar year, 1919	465,860,000	1,515,000
Calendar year, 1920	556,516,000	1,805,000
Calendar year, 1921 (a)	407,000,000	1,326,000

ANTHRACITE

	1921-1922	1920-1921
Dec. 31 (b)	862,000	1,641,000
Jan. 7 (a)	1,281,000	1,597,000
December, 1921	5,984,000	
Calendar year, 1921	87,500,000	

COKE

Dec. 31, 1921 (b)	103,000
Jan. 7, 1922 (a)	110,000
Calendar year, 1921 (a)	5,561,000

(a) Subject to revision. (b) Revised from last report.

A meeting of miners and operators of the George's Creek and Upper Potomac fields was held in Baltimore last week, to discuss lowered wages as an alternative to closed mines. The meeting was deadlocked on the issue and the situation will probably go unchanged until April 1, except for some individual wage agreements.

Hampton Roads dumpings for the week ended Jan. 7 were 220,748 net tons, as compared with the previous week's figure of 199,125 tons. New England took 156,944 tons of the total and bunkers 34,213. There is less coal at the piers and that market is in better shape with the fewer attempts to force coal on coast-wise buyers.

RECEIPTS OF COAL IN NEW ENGLAND BY TIDE AND RAIL
(In Thousands of Net Tons)

Month	Anthracite Tide	Anthracite Rail	Anthracite Total	Bituminous Tide	Bituminous Rail	Bituminous Total
October	324	595	919	1,003	644	1,647
November	255	615	870	869	712	1,581
December (a)	281	557	838	910	560	1,470
Total 1921 (a)	3,704	7,654	11,358	8,824	8,362	17,186
Total 1920	3,520	7,734	11,255	10,211	12,222	23,433
Total 1919	3,309	7,268	10,578	8,527	9,654	18,182
Total 1918	4,116	9,504	13,621	16,057	11,114	27,171

(a) Subject to revision.

The New England all-rail movement declined during the week ended Jan. 7 to 1,953 cars from 2,378 in the week previous. Railroad tonnage is lower and shippers are almost out of the running at points competitive with the Southern coals by water.

ANTHRACITE

Production during the first week of the year was 1,281,000 net tons, as compared with 862,000 tons in Christmas week. Domestic sizes are in better call. Even steam grades are moving easily as supplies had been reduced.

IMPORTS OF ANTHRACITE AND BITUMINOUS COAL INTO CANADA DURING THE FIRST NINE MONTHS OF 1921, WITH COMPARATIVE FIGURES FOR 1915-1920 (a)
(Net Tons)

Year	Anthracite	Bituminous
1915	2,940,000	5,588,000
1916	3,474,000	9,421,000
1917	3,990,000	11,432,000
1918	3,503,000	12,686,000
1919	3,707,000	9,341,000
1920	3,698,000	10,144,000
1921	3,521,000	10,206,000

(a) For several reasons the statistics of imports from the United States, kept by the Canadian Government, and the American statistics of exports to Canada do not agree exactly, the quantities recorded by the Canadian Government usually being somewhat smaller. The Canadian figures are here used as they represent the rate at which coal was received for consumption in Canada.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Dec. 19 1921	Jan. 2 1922	Jan 9 1922	Jan. 16 1922†
Pocahontas lump	Columbus	$3.60	$3.55	$3.40	**$3.25@$3.60**
Pocahontas mine run	Columbus	2.15	2.15	2.15	2.00@2.30
Pocahontas screenings	Columbus	1.55	1.65	1.50	1.35@1.65
Pocahontas lump	Chicago	3.10	3.10	3.10	2.50@3.75
Pocahontas mine run	Chicago	2.25	2.50	2.50	2.00@3.00
Pocahontas lump	Cincinnati	3.25	3.25	3.00	2.75@3.25
Pocahontas mine run	Cincinnati	2.10	2.05	1.90	1.85@2.00
Pocahontas screenings	Cincinnati	1.40	1.55	1.25	**1.15@1.50**
*Smokeless mine run	Boston	4.80	4.70	4.70	**4.70@4.90**
Clearfield mine run	Boston	1.80	2.05	2.05	1.75@2.35
Cambria mine run	Boston	2.35	2.50	2.50	*2.25@2.65*
Somerset mine run	Boston	1.85	1.80	1.80	1.60@2.00
Pool 1 (Navy Standard)	New York	3.00	3.15	3.15	*2.75@3.25*
Pool 1 (Navy Standard)	Philadelphia	3.00	3.00	3.00	2.75@3.25
Pool 1 (Navy Standard)	Baltimore	2.35	2.40	2.50	*2.10@2.50*
Pool 9 (Super. Low Vol.)	New York	2.20	2.35	2.15	**2.15@2.30**
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	2.30	2.30	2.10@2.50
Pool 9 (Super. Low Vol.)	Baltimore	2.15	2.20	2.10	**2.10@2.15**
Pool 10 (H. Gr. Low Vol.)	New York	2.00	2.10	1.90	**1.80@2.10**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.00	2.00	2.00	1.90@2.10
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.00	2.00	1.75	**1.75@2.00**
Pool 11 (Low Vol.)	New York	1.70	1.65	1.70	1.65@1.80
Pool 11 (Low Vol.)	Philadelphia	1.70	1.70	1.70	1.60@1.80
Pool 11 (Low Vol.)	Baltimore	1.75	1.75	1.75	**1.80**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.55	1.50	1.50	*1.35@1.50*
Pool 54-64 (Gas and St.)	Philadelphia	1.55	1.55	1.55	1.45@1.60
Pool 54-64 (Gas and St.)	Baltimore	1.50	1.45	1.40	1.40
Pittsburgh Sc'd. gas	Pittsburgh	2.65	2.65	2.65	2.60@2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@2.20
Pittsburgh slack (Gas)	Pittsburgh	1.55	1.80	1.80	1.75@1.85
Kanawha lump	Columbus	2.85	2.80	2.80	**2.75@3.10**
Kanawha mine run	Columbus	1.80	1.85	1.75	**1.65@1.95**
Kanawha screenings	Columbus	1.05	1.40	1.25	**1.35@1.60**
Kanawha lump	Cincinnati	2.65	2.75	2.40	**2.40@2.60**
Kanawha mine run	Cincinnati	1.35	1.45	1.30	**1.35@1.50**
Kanawha screenings	Cincinnati	1.25	1.25	1.25	*1.00*
Hocking lump	Columbus	2.95	3.00	2.85	2.75@3.00
Hocking mine run	Columbus	1.90	1.90	1.75	**1.70@1.95**

	Market Quoted	Dec. 19 1921	Jan. 2 1922	Jan. 9 1922	Jan. 16 1922†
Hocking screenings	Columbus	$1.15	$1.40	$1.45	**$1.35@$1.65**
Pitts. No. 8 lump	Cleveland	3.00	3.05	2.85	**3.00@4.00**
Pitts. No. 8 mine run	Cleveland	2.90	2.00	2.00	**2.05@2.15**
Pitts. No. 8 screenings	Cleveland	1.60	1.95	1.90	**1.90@2.00**
Midwest					
Franklin, Ill. lump	Chicago	3.80	3.80	3.80	*3.00@3.05*
Franklin, Ill. mine run	Chicago	2.90	2.90	2.90	*2.65@3.00*
Franklin, Ill. screenings	Chicago	2.05	2.10	2.00	1.75@2.25
Central, Ill. lump	Chicago	3.10	3.10	3.10	2.75@3.50
Central, Ill. mine run	Chicago	2.50	2.50	2.50	2.25@2.75
Central, Ill. screenings	Chicago	1.80	1.90	1.80	1.65@2.00
Ind. 4th Vein lump	Chicago	3.35	3.35	3.35	3.00@3.75
Ind. 4th Vein mine run	Chicago	2.75	2.55	2.55	2.40@2.75
Ind. 4th Vein screenings	Chicago	2.15	2.10	2.10	1.90@2.25
Ind. 5th Vein lump	Chicago	2.80	2.95	2.95	2.60@3.25
Ind. 5th Vein mine run	Chicago	2.45	2.25	2.25	2.15@2.40
Ind. 5th Vein screenings	Chicago	1.65	1.80	1.65	1.50@1.85
Standard lump	St. Louis	2.60	2.60	2.60	**2.90@3.00**
Standard mine run	St. Louis	1.90	1.85	1.85	**1.80@2.00**
Standard screenings	St. Louis	1.25	1.65	1.45	*1.25@1.50*
West. Ky. lump	Louisville	2.85	2.85	2.85	*2.50@3.00*
West. Ky. mine run	Louisville	1.75	1.90	1.90	*1.50@2.00*
West Ky. screenings	Louisville	1.40	1.65	1.25	1.00@1.50
South and Southwest					
Big Seam lump	Birmingham	3.65	3.35	3.35	*2.50@3.00*
Big Seam mine run	Birmingham	2.10	2.10	2.10	1.90@2.30
Big Seam (washed)	Birmingham	2.15	2.15	2.15	2.00@2.30
S. E. Ky. lump	Louisville	2.85	2.85	3.10	*2.75@3.00*
S. E. Ky. mine run	Louisville	1.70	1.60	1.65	1.50@1.60
S. E. Ky. screenings	Louisville	1.15	1.30	1.35	*1.15@1.40*
S. E. Ky. lump	Cincinnati	3.15	3.00	2.85	*2.50@2.60*
S. E. Ky. mine run	Cincinnati	1.40	1.50	1.40	*1.25@1.50*
S. E. Ky. screenings	Cincinnati	1.15	1.20	1.25	*1.00@1.25*
Kansas lump	Kansas City	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City	4.10	4.10	4.10	4.00@4.25
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Jan. 2, 1922 Independent	Jan. 2, 1922 Company	Jan. 9, 1922 Independent	Jan. 9, 1922 Company	Jan 16, 1922† Independent	Jan 16, 1922† Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75		$7.60@$7.75
Broken	Philadelphia	2.66	$6.75@$7.50	7.75@7.85	$6.75@$7.50	7.75@7.85	$6.75@$7.50	7.75@7.85
Egg	New York	2.61	6.50@7.00	7.60@7.75	7.25@7.50	7.60@7.75	*7.00@7.35*	7.60@7.75
Egg	Philadelphia	2.66	7.00@7.25	7.75@7.85	7.00@7.75	7.75	7.00@7.75	7.75
Egg	Chicago	5.63	7.40*	6.95*	7.40*	6.95*	7.40*	6.95*
Stove	New York	2.61	7.85@8.25	7.90@8.10	7.85@8.25	7.90@8.10	*7.85@8.00*	7.90@8.10
Stove	Philadelphia	2.66	8.25@8.50	8.05@8.25	8.10@8.35	8.05@8.25	*8.00@8.15*	8.05@8.25
Stove	Chicago	5.63	7.60*	7.20*	7.60*	7.20*	7.60*	7.20*
Chestnut	New York	2.61	7.75@8.25	7.90@8.10	7.85@8.25	7.90@8.10	*7.85@8.00*	7.90@8.10
Chestnut	Philadelphia	2.66	8.25@8.50	8.05@8.25	8.10@8.35	8.05@8.25	*8.00@8.15*	8.05@8.25
Chestnut	Chicago	5.63	7.60*	7.20*	7.60*	7.20*	7.60*	7.20*
Pea	New York	2.47	4.00@5.00	6.05@6.45	4.25@5.00	6.05@6.45	*4.25@4.75*	6.05@6.45
Pea	Philadelphia	2.38	4.25@5.00	6.15@6.25	4.50@5.00	6.15@6.25	4.50@5.00	6.15@6.25
Pea	Chicago	5.63	6.10*	5.60*	6.10*	5.60*	6.10*	5.60*
Buckwheat No. 1	New York	2.47	2.00@2.75	3.50	2.50@3.00	3.50	*2.25@3.00*	3.50
Buckwheat No. 1	Philadelphia	2.38	2.25@2.75	3.50	2.25@2.75	3.50	2.25@2.75	3.50
Rice	New York	2.47	1.50@2.25	2.50	1.75@2.25	2.50	**1.90@2.25**	2.50
Rice	Philadelphia	2.38	1.75@2.00	2.50	1.75@2.00	2.50	1.75@2.00	2.50
Barley	New York	2.47	1.35@1.50	1.50	1.35@1.50	1.50	**1.35@1.60**	1.50
Barley	Philadelphia	2.38	1.00@1.25	1.50	1.00@1.25	1.50	1.00@1.25	1.50
Birdseye	New York	2.47	....	2.50	....	2.50		2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in **heavy type**, declines in *italics*.

Foreign Market And Export News

British Wage Revisions for January Permit Lower Prices; Home Markets Dull

Wage Cuts Cause Dissatisfaction Among Miners—Production Affected by Holiday Idleness—Congestion at Welsh Docks Hampers Coal Output

British production for the week ended Dec. 31, 1921, was affected by the holidays, the output slumping to 3,050,000 gross tons, according to a cable to COAL AGE, as compared with 4,965,000 tons the preceding week. Quotations for export are softer.

As a result of the investigations of the joint auditors North Wales colliers have received a January wage increase of 3d. per day, which brings their wages up to 9s. 5d. per day.

The Welsh coal fields are rarely entirely free from trouble; in the Maesteg area the men, acting on the recommendation of their leader, have decided to tender fourteen day's notice at all collieries in the district. The trouble is due to the fact that the owners have refused to reinstate men previously dismissed because they claimed the minimum wage in some cases, and in others because they declined to work as "scab" labor in the places of discharged men. The men also complain that they are losing various bonuses and allowances which they have been in the habit of receiving for years past.

Trouble has also appeared in the West Yorkshire area. The West Yorkshire Coalowners' Association has asked to be allowed to withdraw from the Eastern Area Board on the ground that they are unable to pay the district rates as provided for in the National Agreement.

January wages in Northumberland have been reduced to 85.76 per cent above the basis, or only 5.76 per cent above the minimum provided for in the National Agreement. These rates are now 23.84 per cent above the 1914 level, while the cost of living index remains 99 per cent over pre-war. The trade generally in this area is improving and the rise in exports is maintained.

Demands from India and the Far East are keeping Wales busy throughout January, though congestion at the Welsh docks is still a source of grievance and is preventing many pits from reopening.

Durham miners will undergo a wage cut of 25.86 per cent this month. This cut represents a loss in wages varying from 9d. to 1s. 1.44d. The Forest of Dean miners' wages are being reduced by 2 per cent, coal-face men now getting 7s. 5d. per shift.

Coal Paragraphs from Foreign Lands

GERMANY—Production of coal in the Ruhr region during the week ended Dec. 24, 1921, was 1,889,000 metric tons, while during the week ended Dec. 31 the output was 1,477,000 tons, according to a cable to COAL AGE.

ITALY—The price of Cardiff steam first is quoted on the Genoa market at 37s. 6d., according to a cable to COAL AGE. This compares with 38s. 3d. on Jan. 7.

HOLLAND—Quotations on the Rotterdam markets show British coal at 18 gulden or 31s. Late December quotations averaged 16.75 gulden or 29s.

High Operating Costs Keep French Coal at Mines; British Sales Increase

The French coal market is stationary. Operators are faced by the hard British competition and find it hard to dispose of their output. On the other hand, the men are fighting to avoid a reduction of wages, and the result is that the mines have to keep their coals in stock. This of course has of late given some impetus to the sale of British coals.

The French industry has had reason to complain about the insufficient deliveries of coke by Germany. The minimum figure provided for under the Reparations Act is 15,000 tons a day. Of late this has been as low as 9,000 tons, and quite a few blast furnaces have had to stop. Energetic steps are taken to bring the German deliveries to the normal level.

The position as regards output and stocks at the mines is as follows:

	Aug. 31	Sept. 30
Stocks at the mines		
France	1,631,629	1,712,843
Saar District	648,164	670,190
Stocks in French ports (foreign coals)	699,594	650,770
Stocks held by		
Railway companies	1,306,726	1,383,265
Paris gasworks	....	193,265
Electric group	....	50,771
Production for October:		
France	2,592,219	
Saar District	749,554	

FRENCH IMPORTS, OCTOBER, 1921

	Tons
Coal	
Great Britain	777,645
Belgium	176,167
United States	20,745
Germany	373,170
Sarre	115,147
Other countries	325,781
Total coal	1,808,605
Coke	
Belgium	12,640
Great Britain	19
Germany	27,569
Other countries	413
Total coke	40,641
Briquets	
Great Britain	32,948
Belgium	48,070
Germany	23,488
Other countries	———
Total briquets	104,506
Total, all fields	1,953,752

Pier and Bunker Prices, Gross Tons

Pier and Bunker Quotations by Cable to Coal Age

PIERS

	Jan. 7	Jan. 14†
Pool 9 New York	$5.50@$5.65	$5.50@$5.60
Pool 10, New York	5.20@ 5.35	*5.20@ 5.30*
Pool 9, Philadelphia	5.50	5.50
Pool 10, Philadelphia	5.10@ 5.40	*5.10@ 5.30*
Pool 71, Philadelphia	5.50@ 5.75	*5.50@ 5.60*
Pool 1, Hamp. Rds.	4.65@ 4.75	**4.70@ 4.90**
Pools 5-6-7 Hamp. Rds	4.25	**4.30**
Pool 2, Hamp. Rds.	4.50@ 4.60	4.50@ 4.60

BUNKERS

	Jan. 7	Jan. 14†
Pool 9 New York	5.80@ 5.95	*5.75@ 5.90*
Pool 10, New York	5.50@ 5.65	*5.50@ 5.60*
Pool 9, Philadelphia	5.60@ 5.85	5.60@ 5.85
Pool 10, Philadelphia	5.40@ 5.50	5.40@ 5.50
Pool 1, Hamp. Rds.	4.75@ 4.85	**4.80@ 5.10**
Pool 2, Hamp. Rds.	4.60@ 4.70	**4.60@ 4.75**
Welsh, Gibraltar	40s. f.o.b.	40s. f.o.b.
Welsh, Rio de Janeiro	65s. f.o.b.	**65s.** f.o.b.
Welsh, Lisbon	45s. f.o.b.	45s. f.o.b.
Welsh, La Plata	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Marseilles	125 fr. f.o.b.	125 fr. f.o.b.
Welsh, Genoa	40s. t.i.b.	40s. t.i.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Malta	45s. f.o.b.	45s. f.o.b.
Welsh, St. Michaels	60s. t.i.b.	60s. t.i.b.
Welsh, Las Palmas	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Port Said	51s. 6d. f.o.b.	51s. 6d. f.o.b.
Belgian, Antwerp	32s. 6d	32s. 6d
Alexandria	42s.	**46s.**
Bombay	38 rupees	38 rupees
Capetown	42s. 6d.	42s. 6d.

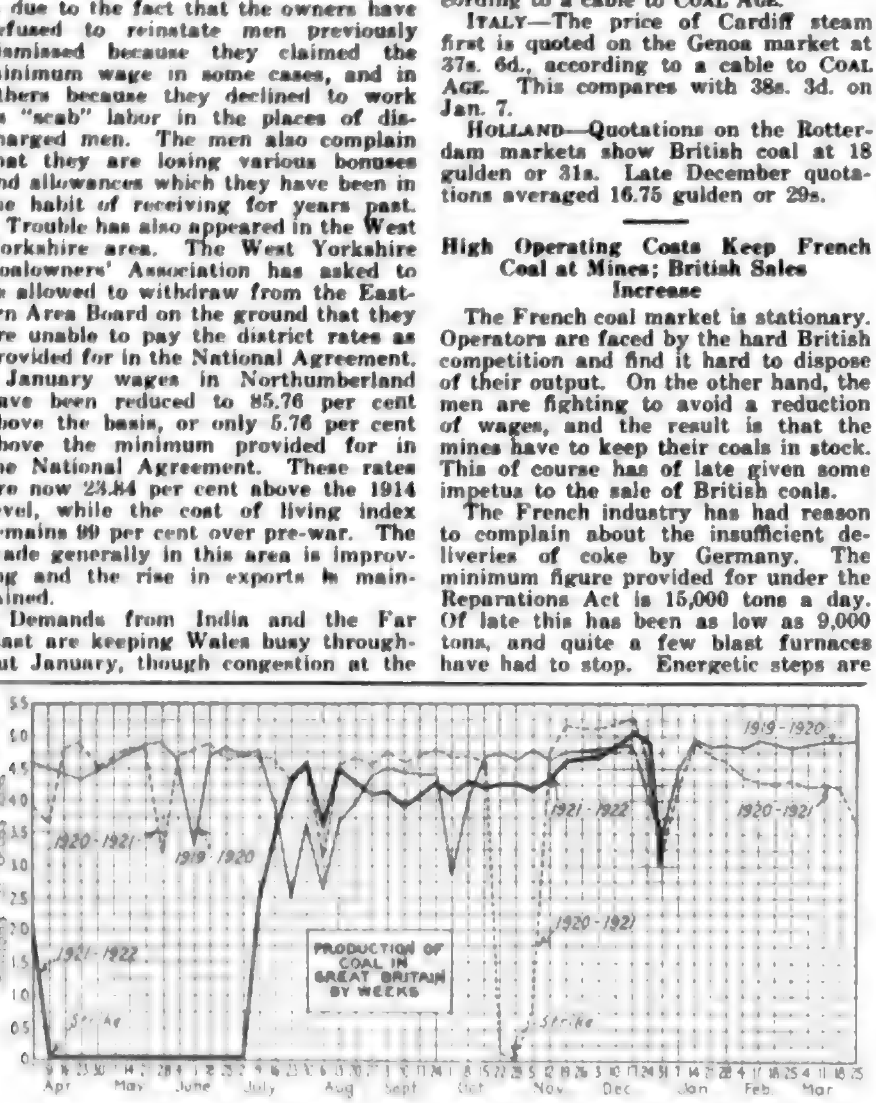
Current Quotations British Coal f.o.b. Port, Gross Tons

	Jan. 7	Jan. 14†
Cardiff:		
Admiralty, Large	24s. 9d.	24s. 6d.@25s.
Steam, Smalls	18s. 6d.@19s.	*18s.@19s.*
Newcastle:		
Best Steams	23s. 6d.	**23s. 6d. to 24s.**
Best Gas	21s. 9d.	*21s.@21s. 6d.*
Best Bunkers	21s. 3d.	*20s. 6d.@21s.*

† Advance over previous week shown in heavy type declines in italics.

Hampton Roads Pier Situation

N. & W. Piers, Lambert's Point:	—Week Ended— Jan. 5	Jan. 12
Cars on hand	1,103	1,277
Tons on hand	66,424	67,645
Tons dumped	94,234	86,525
Tonnage waiting	2,800	7,450
Virginian Ry. Piers, Sewall's Point:		
Cars on hand	926	781
Tons on hand	51,400	42,950
Tons dumped	73,293	89,822
Tonnage waiting	10,418	6,326
C. & O. Piers, Newport News:		
Cars on hand	616	605
Tons on hand	30,800	30,250
Tons dumped	44,800	34,469
Tonnage waiting	......	7,320



Reports From the Market Centers

New England

BOSTON

Dull Market — Railroads Report Less Traffic — Hampton Roads Coals Somewhat Steadier — Improvement in Anthracite Only Slight.

Bituminous—Aside from small scattering purchases the current market is lifeless. The Hampton Roads agencies are distributing a little tonnage at the various rehandling points and there is also a slightly better movement of best grades from central Pennsylvania. Buyers continue indifferent, however, and anything approaching a reaction is still some distance ahead.

Not only is there no railroad buying but the New England roads report a falling off in general traffic as compared with early December. With less coal consumed by the railroads it is clear there can be no improvement in conditions during January.

Prices show little change. The Pennsylvania grades are held at the minimum figures which different operators set for themselves some months ago. Spasmodic attempts are made to resume operation but in the Clearfield district there is small hope of realizing more than $1.75@$1.85 per net ton even for grades that have been classified as among the best in that region. Hampton Roads coals also show little change. On cars Boston and Providence for Inland delivery $6.25@$6.40 still continues the basis for Pool 1.

The smokeless grades generally are steadier as to price than was the case a fortnight ago. Operators are more closely confining their output to week-to-week requirements and the surplus at the piers has been materially cut down. Looking at the market as a whole, it is safe to say there is less inclination to force sales than has hitherto been the rule.

Anthracite—Retail trade is somewhat better than in December. It will take some time, however, for this to react favorably on the wholesaler, the tonnage in dealers' yards being about three times what it was a year ago.

Tidewater—East

NEW YORK

Anthracite Shows Improvement—Steam Sizes Move Better—Bituminous Market Firmer—Many Contract Inquiries Received—Most Operators Not Quoting.

Anthracite—There was some improvement in the situation last week. Demand for all sizes indicated heavier consumption but was far from normal. The greatest activity, however, centered on barley, which only a short while back was the hardest to move.

There is a strong tendency on the part of consumers to buy only as needed. Because of this, retail dealers who have their yards filled with coal are not moving it as rapidly as they would like.

The steam coals are in demand as the surplus has been cut down considerably by the reduced production. The better grades of independent coals were quoted as much as 10c. above the regular company circular.

Bituminous—Conditions were slightly improved. Demand was stronger while the tonnage available at the local piers was considerably below normal requirements. Local deliveries were not interrupted by the strike of harbor boatmen. Wholesalers report a little more activity. At the same time buyers are looking for the lowest prices, also taking into consideration the quality of the coal.

There has been an increased number of inquiries concerning contracts for the new coal year, but operators as a rule are not quoting because of the uncertainty of conditions on April 1. Stray quotations for contracts for the better grades have been heard ranging $2.75@$3.20, while certain Fairmont coals have been quoted around $2, all of these being subject to wage conditions.

There has not been much improvement in demand for industrial consumption but there has been a decided improvement in the feeling. Conditions in the export and bunker markets continue unchanged.

PHILADELPHIA

Better Anthracite Buying — Retail Prices Still Unstable — Steam Moves Easier — Bituminous Market Shows Signs of Life—Some Contract Negotiations—R.R. Buying Increases.

Anthracite.—Recent buying at retail has been fair. This bolstering has been brought about by an old-time storm of snow and wind, which quickly put the consumer in the mood to take in coal. Operators also have felt the better weather conditions. There has been a general increase of working time among the independents.

The companies report a strengthening of all steam sizes. Large users of buckwheat and rice have urged increased shipments, as the amount of independent coal which they have been able to buy at cut prices has been reduced by short working time.

Bituminous.—There is only a moderate amount of spot buying, the consumer still being quite wary of taking in more coal than needed for current consumption. It has been a good many years since business has been solicited so closely, with many concerns offering valuable service, such as the use of combustion experts, which was almost unheard of a few years ago, except with the most progressive.

Recently there seems to have been considerable effort on the part of some interests to get contract business, having in mind the possibility of a strike after April 1. The most active ones in this move seem to be those who can control non-union tonnage, using this as an argument with the consumer to assure some kind of protection.

Some producers believe that the railroads who formerly contracted for a large proportion of their tonnage, will decline to enter into agreements. They have been so successful with prices slightly under the market that they seem inclined to go through with the plan indefinitely, feeling that in the event of any trouble they will be the last to suffer, if at all. There recently has been some increased spot buying on account of the rail lines, who are stocking a little tonnage.

BALTIMORE

Georges Creek and Upper Potomac Operators and Miners Deadlocked on Wage Cut — Bituminous Market Very Soft—Hard Coal Demand Improves.

Bituminous—Demand remains poor on line business with prices to correspond. The export movement is at a standstill and operators and miners of the Georges Creek regions have failed to reach an agreement for a cut in wage scale which was calculated to re-open some of the operations.

The conference in Baltimore between operators and miners of the Georges Creek and Upper Potomac fields ended in a deadlock, and there will be no general change until April 1. Some operators have made cuts from the agreement as individuals and are operating on that basis.

The general result would seem to be that the mines will stay idle in large measure until April 1, especially as the call for coal is so light and prices so low at present as to make operations none too profitable, while after April 1 there seems to be no doubt but that a largely decreased wage scale will go into effect.

Anthracite—While not as satisfactory as in former years there has been a spurt in buying. Orders are coming in in much better shape with the present cold spell.

Local yards are still fairly well supplied, and there is at this time no fear of a shortage in any size. Prices have undergone no change and there now seems little likelihood of a readjustment from present schedules before the approach of spring.

BUFFALO

No Change in Local Market — Non-Union Coals Fill Bulk of Demand—Anthracite Sales Below Normal—Coke Tonnage Light.

Bituminous—The trade has recovered somewhat from the holiday dullness, but is still decidedly quiet, with not much prospect of becoming active before the April suspension. With the present slow rate of consumption buying will not need to be very strong to keep up the supply.

The fact that at present a great part of the coal is turned out from non-union mines has been overlooked by those who predicted that there would need to be a spurt to provide enough to carry consumers over the suspension.

Quite a large amount of coal is offering at low figures although standard shippers mostly manage to avoid it. They refuse to help out the operators who send out their coal unsold and let it go at a sacrifice, believing that it will do the most good in the trade that way. With last year one of continual sag it is time that something was done to get it on a better basis.

No particular change in bituminous

prices has taken place. The jobbers quote all prices weak at former levels.

Anthracite—The trade is about as quiet as it ever was at this time of the year. The sellers are much astonished over the situation. Nobody can say how the householders can get along with one-half to two-thirds of what has usually been burned in the season.

Northwest

MINNEAPOLIS

Spot Market a Weather Proposition—Price Cuts Only a Slight Aid—Industrials Quiet, but Signs of Improvement Seen.

There has been some increase of sales, although not large. It merely establishes that under no conditions will there be much activity in coal selling, so long as commercial conditions remain as they are. When severe weather causes increased consumption, the orders are based upon the minimum which may serve to cover immediate needs. As soon as this subsides, the pick-up in selling falls away also.

Demand from the steam trade is confined to narrow channels and there is nothing to suggest any immediate change for greater buying. Industrially, the situation is slow. There are some instances of shops resuming activity after a shutdown during the holidays or longer, but this merely serves to offset the extra dullness which attended the holidays. Some of the railroads are soon to put on larger forces in car repair work. This is promising as indicating that the roads see coming needs of additional rolling stock.

DULUTH

Outlook Much Brighter — Iron Range Activity Noted — Domestic Movement Slow Despite Price Cuts.

Although shipments slumped during the past week owing to warm weather, the outlook is brighter than at any time since navigation closed. Every day the industrial situation is reported as brighter, and it seems probable that the Iron Range and manufacturing concerns will take a large amount of surplus stocks before navigation opens.

Industrial orders are much larger but household consumption remains low. Several towns throughout northern Minnesota and Wisconsin, which would normally have received about ten cars of coal up to this time of year, have not even put in an order for one car so far. The mild weather is aiding consumers to burn wood in these places and coal has not been used.

Inland West

CHICAGO

New Year Brings Some Failures and Consolidations — Market for Domestic Poor—Anthracite Moves Slowly.

As was expected, the first of the year brought to light a few failures in the coal business. These failures, for most part, were wholesalers, and while they have been relatively unimportant have made operators very careful to whom they offer their coal. There have also been a few consolidations. Practically every case of this sort has been a decided benefit to the trade.

The domestic market is extremely poor. Retailers are continuing in 1922 the very unsatisfactory policy of buying only in small lots at lowest prices.

The steam coal market is quiet indeed. The few concerns working are able to get as much coal as they want at reasonable prices, and are not stocking.

CINCINNATI

Prices Touch Bottom — Underselling Becomes Difficult — Market Absorbs Heavier Tonnage—Retailers More Active.

Values are steadily swinging around to the place where agencies find it difficult to undersell competitors; in other words, for the first time in six months certain makes of coal have come to the place where the price is fixed, with little rises or declines, by reason of supply and demand. This has been shown several times within the past few weeks here and it has also been shown that those makes which permit of underselling can still be pared down.

A good illustration is the precipitous decline of southeastern Kentucky block. Within the past week one concern, in an effort to fill up on domestic business, cut the price to $2.25 a ton. In a short time this was the standard price. On the other hand, the slack, which ranged 75c.@$1.25 for weeks has risen to $1 and higher.

COLUMBUS

Colder Weather Stimulates Domestic Buying—Steam Business Is Still Slow —Softer Screenings Market.

With retailers doing better business, orders for replenishment of their stocks are coming in. This applies more especially to northern Ohio and sections of Michigan. There is no corresponding increase in the steam movement.

Stronger retail prices are developing with the buying movement. Hocking lump is selling $6@$6.50 and West Virginia splints $6@$7.50. Pocahontas is fairly strong at $8.75@$9 and anthracite is $14.50. Householders are buying in small lots.

Manufacturing establishments to a certain extent are resuming operations but their fuel requirements are not large. With a better domestic demand the screenings market is expected to weaken.

CLEVELAND

Possible Coal Strike Effects Reflected in Slightly Better Market — Industrial Outlook Improves — Labor Liquidation Necessary.

The feeling is growing stronger among industrial consumers that a miners' walk-out is inevitable. Moreover they are extremely anxious that the operators hold out for substantial reductions, because it is pointed out that the relatively high wages of miners constitute one of the serious drags on industrial machinery. It is generally recognized that current coal prices are in many cases lower than production costs justify. Consequently, the next essential step in the process of readjustment is to bring down union miners' scales. This development should go hand in hand with further reductions of the wages of railroad employees.

Some consumers, although inclined to buy coal because of the prospective strike, are postponing ordering as long as possible in the hope that freight reductions will be made. One other factor which soon will become effective, according to present indications, is that of reviving industrial operations.

Buying has been so low since October that stocks are now meager and any expansion of activity will force buyers into the coal market. In Detroit there are five times as many men employed as there were in the same week of 1921.

Southwest

KANSAS CITY

Retail Trade Picks Up—Strike Problem Complicated by Howat's Order.

The temperature has been more seasonable during the past week than for any time this winter. This has resulted in some retail activity but no dealers are using more than half their facilities for delivering coal.

The Kansas strike becomes more of a problem every day. Howat has apparently ordered the striking miners back to work. These are the outlaw strikers that defied the national organization. If the operators take any of these men back it will result in a strike, as they are without cards of membership in the United Mine Workers.

It would seem that these followers of Howat have given enough trouble and it will be a good time to get rid of them, as they have held their jobs, not because of any efficiency but because they were followers of Howat and did his bidding which has cost the operators millions of dollars. To take these men back would be recognizing Howat's authority and repudiating Lewis who has acted with fairness and good judgment.

South

BIRMINGHAM

Cool Weather Helps Retail Trade—Wholesale Market Still Dull—Domestic Prices Reduced.

Weather conditions the past week have been more favorable for the retail dealers. However, stocks have not been reduced to a point demanding replenishment, and therefore the wholesale trade has received no benefit so far. Quotations on lump show further reduction, but the demand is light and lower prices fail to induce more active buying.

Commercial requirements continue at a low level and there appears little prospect of material improvement in the near future. Industries using steam coal are operating on short and irregular schedules, only buying coal in such quantities as needed for immediate use.

LOUISVILLE

Improvement Very Slow — Continued Mild Weather Retards Trade—Screening Moves Best.

The trade is about as quiet as it could possibly be at this time of year, and still be operating. Retailers are cutting yard stocks down a little through slow sales and non-replacement. Industrial operations are light, railroad consumption small, and gas and byproduct companies are not much interested in the current market.

Some of the big interests which operate their own mines have been selling in the open market for months past, as they cannot begin to consume their own production. Competition for such business as can be had is so keen, that it is hard work to make any sort of showing.

Screenings, while reported at relatively low prices to keep them under mine run, are hardly to be had, as production is small, due to lack of prepared demand. Many concerns which usually burn screenings are taking mine run, but many are not equipped to burn mine run, and as a result are having trouble in locating fine-coal supplies.

West

DENVER

More Mine Wage Cuts Pending—Production Limited to Low-Cost Operations.

Striking miners have virtually given up the fight against the reduction in wages of 30 per cent. The cut has been far-reaching, several mines under union contract, temporarily shutting down.

Striking miners in Fremont County —the only place where the strike against the Colorado Fuel & Iron Co.'s 30 per cent wage cut has been effective—have agreed to the reduced wage scale. Permission to reduce wages to the pre-war scale was given eleven smaller coal mining properties, operating in Southern Colorado, by the Colorado industrial commission.

Of the cases still pending, that of the old Pike View coal mine, north of Colorado Springs, is considered the most important. It is the first lignite mine in the state in which notice has been given of a wage reduction.

SALT LAKE CITY

Retail Business Entirely a Weather Proposition — Production One-Half of Normal.

Retail business is picking up again. This is due solely to weather conditions, for consumers are not showing a disposition to store coal any more than they did a few months ago.

The wholesale market is still rather quiet, but a little better locally on account of the change in weather. Production is less than 50 per cent of normal.

News From the Coal Fields

Northern Appalachian

UNIONTOWN

All Markets Stagnant—Contract Interest Appears—Spot Prices Are Soft.

While the coal market continues stagnant there is evidence that big consumers are looking toward renewal of old or placing of new contracts for 1922 delivery. Large railroad interests which have been receiving at least a part of their fuel requirements from the Connellsville region have inspectors on the job going over mines and facilities.

Activity in the spot coal market is very limited. Prices continue soft and where sales are recorded the average price is $1.30@$1.50 for steam grades and $1.50 for byproduct.

The coke market is inactive, there having been a lull since the closing of 1922 delivery contracts. Quotations however, are unchanged, $2.75@$3 prevailing for standard quality with a 25c. discount for heating quality. Few sales are recorded for 72-hr. coke, with a price of $3.75@$4 prevailing.

UPPER POTOMAC

Some Resumption at Lower Costs — Market Flabby — Non-Union Competition Is Keen.

Some resumption of operations was noted at mines where lower working arrangements had been made. In general the mining scale was so high that most producers remained idle. A few contract orders still held and a little railroad fuel was being handled but the spot market was inactive.

CENTRAL PENNSYLVANIA

Production Is Heavier—Demand Improves Slowly—Prices Still Unprofitable.

Operators are experiencing a slight increase in business. The prediction that the elimination of the transportation tax on Jan. 1, would stimulate buying had that effect to a certain extent. Even though the demand increased, there were no changes in prices and Pool 1 is quoted $2.85@$3; Pool 9, $2.20@$2.30; Pool 71, $2.25@$2.40; Pool 10, $1.95@$2.10 and Pool 11, $1.65.

That stabilization is necessary to stimulate production is very evident, as operators cannot make any profit at prices quoted. The first week of January shows a production of 11,491 loads, or an average of 2,298 per day. The output for the last week in December was 9,234 cars.

PITTSBURGH

General Market Softer—Prices Down to $1.50 on Competitive Steam Mine Run — Carnegie Steel May Buy Mines Near Clairton.

The coal market has grown even softer in the past week. Prices as low as $1.50 have been accepted on good sized lots of steam mine run by non-union producers in territory competitive with the Pittsburgh thin vein district, while ¾-in. gas of ordinary quality, until recently at $2.30 as minimum, has sold $2.15 and $2.10 or less. The Pittsburgh district proper is still quiet.

A rumor is in circulation that the Carnegie Steel Co. is negotiating for a considerable part of the Pittsburgh Coal Co. properties, near the Carnegie byproduct coking plant at Clairton.

ANTHRACITE

Production Resumed After Holidays—Colder Weather Brings More Orders—All Sizes Move Better.

A number of the Lehigh Valley mines have resumed operations, following a strike which was settled on the company's terms. The convention of the United Mine Workers, which opened in Shamokin on Jan. 17, is being noted with interest, as it is expected that it will formulate the miners' demands for the new wage scale.

Continued cold weather together with the holiday cessation of production has increased the demand. Collieries are resuming work, independents being able to sell their output more easily than for some time past. A heavy snowstorm crippled production temporarily last week.

Four men were entombed, three injured and several others had narrow escapes from death last week when twenty acres of land dropped in a mine-cave of gigantic proportions in the National Mine of the Glen Alden Coal Co.

EASTERN OHIO

Production Slightly Heavier—Slow Upturn in Consumption — Wage Controversy Not Yet a Market Factor.

Reports from industrial centers display considerable optimism and the volume of mining in eastern Ohio during the week ended Jan. 7 may be construed as portraying a slight upturn in the coal business for the first week of the new year.

The output for the week was 275,500 tons or 53 per cent of potential capacity, compared with the preceding week, also consisting of five work days, when production was 257,000 tons.

Inquiries are more numerous but urgency of fuel requirements is not as yet manifesting itself to the extent of any decided turn for the better. Spurts of extreme weather have given some encouragement to retailers and elicited inquiries from them looking to replenishment of depleted stocks.

Industries are content to continue purchasing on a hand-to-mouth program and there is as yet no inclination to store for fear of a miners strike April 1. There will have to be further revelations in the anticipated labor controversy before it becomes a market factor.

With inventory periods passing and manufacturing establishments either resuming or enlarging their operating schedules, the trade seems to be of the opinion that constructive developments overshadow the deterrent elements and a more healthy market situation is expected before many weeks.

CONNELLSVILLE

Spot Furnace Stiffer, Contract Furnace Easier — Foundry Unchanged — Production Declines.

Furnace coke is easier on contract and stiffer on spot, bringing prices closer together and into a natural alignment. While early in December two or three first-quarter contracts were made at $3.40 or $3.50, later in the month some business was done at about $3.25, while the latest contract reported is at $3.10.

The spot furnace coke market, on the other hand, has stiffened. There was only a limited amount of coke available at less than $3. Foundry coke continues in light demand, but prices are no easier. There remains some to be had at $3.75, but discriminating buyers are taking considerable tonnages at $4.25. Present quotations are: Spot furnace, $3; contract furnace, $3.10@$3.20; spot foundry, $3.75@$4.50.

The *Courier* reports production in the week ended Jan. 7, at 47,120 tons by the furnace ovens, a decrease of 8,140 tons, and 34,010 by the merchant ovens, an increase of 840 tons, making a total of 81,130 tons, a decrease of 7,300 tons.

FAIRMONT AND PANHANDLE

R.R. Fuel Orders Increase—Spot Demand Quiet Except for Slack—Heavy Oversupply of other Coals.

Fairmont

A decided increase in railroad fuel production was noted during the week ended Jan. 7. Other markets were extremely limited. Prices failed to show any recovery and there was a good deal of coal under load on sidings as the week came to a close.

Northern Panhandle

Railroad fuel tonnage also increased in this field. Commercial mines were restricted by poor markets to about 25 per cent of capacity. Spot demand was negligible, and contract orders alone permitted an output. Slack was in best call because of the scarcity.

Middle Appalachian

HIGH-VOLATILE FIELDS

Steadier Production Follows Holidays—Slack Coal the Only Spot Activity—Contract Orders and Inquiries Increase.

Kanawha

Operations were slightly greater during the first week of January but only because the field was recovering from the holiday idleness. Only slack was in demand and no-bills on other grades were heavy. Contract orders were increasing a trifle.

Logan and Thacker

More coal was loaded in the Logan field due to greater contract activity and a better market for slack. To fill the latter demand, however, meant a further accumulation of domestic sizes for which there was no market.

Following the holiday period, Williamson mines worked more steadily. Standing orders constituted the main activity. Prepared sizes were sluggish which held down slack tonnage and made for higher spot prices on that coal.

Northeastern Kentucky

Big Sandy mines produced 25 per cent of capacity, this slight increase being made possible by more contract orders. The spot market was as quiet as ever, prices being unchanged.

LOW-VOLATILE FIELDS

Pre-Holiday Conditions Return—Some Resumption at Lower Wages — Slack in Good Call—Healthier Line of Inquiry.

New River and the Gulf

More New River mines were planning to get into operation during the week ended Jan. 7, with a lower wage scale in effect. That was the only method by which it was possible to get back into the market, and the slim demand made this none too easy.

Winding Gulf production failed to recover from the holiday slump although there was a little more firmness to the spot market. Tidewater inquiries were becoming more plentiful as the available supplies at the piers diminished.

Pocahontas and Tug River

Production in the Pocahontas region increased slightly although producers had to content themselves mainly with contract business as the spot market was unchanged. Much of the output went to Western destinations and only for slack was there a good demand.

Tug River entered the new year with a larger output, although the field was much below capacity owing to inability to find a market in excess of contract orders. A regular flow continued to steel companies and Western consumers, and there was a distinct call for slack.

Middle West

MIDWEST REVIEW

Domestic Trade Sluggish — Steam Demand Slow—Relief Must Come Through Lower Wages.

The writer spent part of last week in the Northwest and called on a number of retail dealers who ordinarily do a big business at this time of the year. Everywhere the story was the same. In every small town there have been very lately, a number of failures. These failures, while undoubtedly unimportant in the aggregate, are having a tremendous influence on the people. Strict economy in everything is the order of the day and buying, when it is done at all, is only done when the farmer is faced with absolute necessity.

Dealers are now spreading their buying over half a dozen firms and buying only on the longest terms. Some operators are selling on a sixty to ninety day basis, but this method of doing business has been frowned upon by more reliable and responsible companies.

Screenings are holding firm in price. The market has not felt any great pressure which eventually will be brought to bear when the industries become a little alarmed over the coal strike problem which must be faced in April. A few of the larger coal companies are telling their trade that difficulty can be looked for with the United Mine Workers as soon as their present contract expires, but up to date this propaganda has been practically fruitless, so far as drumming up business is concerned.

The big buyer apparently does not care whether there is a strike or not, because he sees no signs in the future that he is going to have much running time. There will, of course, be some buying before the first of April, but operators today do not think the volume will be anywhere near as great as was expected two months ago.

Illinois operators are coming out flat-footed in favor of the abolition of the check-off and a very drastic reduction in wages. It is expected that poor running time between now and the expiration of the present agreement will put the miners in a more amenable frame of mind. Illinois and Indiana operators cannot continue as they have been because competition from Eastern coals is growing keener every day.

SOUTHERN ILLINOIS

Movement Light—Prices Down to Production Cost—Railroads Beginning to Store — Some Commercial Buying for Future.

Throughout the entire Carterville field several mines are still idle. Companies having several properties are usually operating only one. The steam situation is perhaps the best. Screenings and small nut sizes are moving fairly well.

No one particular section is getting much domestic coal. There will be a run of lump for a few days and then it will run to egg and perhaps nut, so that there is always an abundance of some sizes at the mine which has a tendency to congest conditions.

The St. Louis & San Francisco Ry. is beginning to store some coal. There are about 35,000 tons in storage now and it expects to lay in perhaps 50,000 tons more. The Wabash now has 75,000 tons in storage and is expected to put down 175,000 to 200,000 tons. The Chicago & Alton is also storing coal. The M. K. & T., Eastern Division, has some storage ahead and is laying in more. The Rock Island lines are gradually accumulating a pile. The Cotton Belt has always carried a fairly decent tonnage ahead but it is understood that it is arranging to store for the future.

WESTERN KENTUCKY

General Demand Slow — Individual Wage Cuts—Lower Scale Necessary.

The situation is not especially promising. Many mines are down and demand is poor. Reductions in Alabama coals have made it harder for western Kentucky to enter some of the Southern districts.

Retailers are not stocking anything. Industrial consumption continues low. While there is some little demand for screenings it is not as good as it was.

It is understood that a few operators have reduced wages under private agreements with workers, but the scale is being maintained as a whole. However, a renewal of the present scale is not even given any consideration. Operators cannot pay present wages and meet competition of fields which are not unionized.

Southern Appalachian

SOUTHEASTERN KENTUCKY

Production Increased—Prices Lowered to Meet Keen Competition.

The second week of January has brought a ray of hope for the industry. No great change for the better has occurred, but production in the Bell and Harlan fields has been increased. The L. & N. is pulling nearly twice as much coal from the mines on the Cumberland Valley Division as the average for December. Hard work and keen competition will predominate in 1922 and the sooner we settle down to the former the earlier we can meet the latter.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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The Strike Cloud's Silver Lining

OPERATORS of non-union mines have assured the government that in the event of a strike in the organized coal fields they will be able to attain an output of 6,000,000 tons per week. It is evident that such a rate of production would go far toward alleviating a shortage of coal during the time of year in which the strike may occur. Soft coal is now being produced at the rate of 7,500,000 tons per week, and 6,000,000 tons from the non-union mines would be 80 per cent of the amount the consumers are now demanding.

During the first week of the strike in November, 1919, when the union was much stronger than now, output was 29.6 per cent of the best previous record for four consecutive weeks, those ended with Oct. 25, 1919, when the daily average was slightly in excess of 2,000,000 tons. The second week of that strike recorded 33.3 per cent of that figure, the third week nearly 45 per cent and the fourth and sixth weeks 48 per cent, with the fifth week falling behind to 43.5 per cent. The daily average in the third, fourth and sixth weeks was better than 900,000 tons.

The combined output in 1918 of the non-union fields of Pennsylvania, West Virginia and Colorado, and all of eastern Kentucky, Virginia, Alabama, New Mexico, Utah, Washington and Tennessee was, in round numbers, 200,000,000 tons, or about 4,000,000 tons per week on the average, which was one-third the total for the country. That these fields were able to increase this figure by nearly 50 per cent during the strike of 1919 was due to the opportunity afforded for full operation by ample car supply. Every mine, save only those on the Louisville & Nashville R.R. in the Hazard field in eastern Kentucky, had all the cars every day that could be loaded. Within two weeks after that strike began the railroads in southern West Virginia were loading in excess of their best previous record, although the Kanawha and New River districts were closed.

The non-union operators will be able to repeat this performance, being strengthened in number now, if the railroads can do their part. This they should be able to do, for their lines will be freer of other traffic and the weather will be more favorable next spring than in November and December, 1919. One favorable condition existing then, unified control, is now absent, however.

The demand for coal, both soft and hard, normally is below the general average in April. As regards anthracite, a shutdown of the mines of not more than eight weeks would cause no hardship at such a time and the deficiency could largely be made up before severe weather the next winter. Of bituminous there will be large stocks in the hands of consumers by the end of March, and with a production reaching 6,000,000 tons, if not at the start, at least soon after a strike should be called, the country should have little difficulty in keeping up normal operations and for a limited time would not suffer for lack of coal.

All of which is not argument for a strike but reason why one would be fraught with likelihood of failure.

The Bituminous Industry After April 1

IT IS as yet, of course, a matter of opinion as to whether agreement on a new wage scale at the coal mines can be reached without cessation of mining. That the country might have advance notice of the possibility of a coal strike, Secretary Hoover gave a statement to the press on Jan. 19 to the effect that the stage is all set for an industrial disturbance of the first magnitude. Those who heard Mr. Hoover make this statement did not get the impression that the government has abandoned hope of influencing a settlement without resort to industrial warfare, but he made it clear that no progress toward that end has been made as yet and that the line of approach has not even been indicated. Mr. Hoover has had several conferences with the president of the United Mine Workers and with a number of coal operators in recent weeks. He speaks as one who is well informed. He is not given to making off-hand statements.

Let us begin by getting right at the meat of the situation—the reasons why Mr. Hoover has come to the conclusion that the stage is now set for a strike. Conditions in the hard- and soft-coal industries are somewhat different, so we may consider bituminous coal first. The operators of the union mines are paying their men, both day and tonnage, the highest wages in the history of the business. The contract with the union under which these wages are being paid is the result of an award by a commission appointed by the President of the United States, following the strike of 1919, modified by the addition of $1.50 per day to day men in the summer of 1920, on the demand of the laborers.

Labor represents 70 per cent of the cost of producing coal. When there is no demand for coal, the coal is left in the ground and the miner draws no pay. In 1921 there was demand from consumers both here and abroad for coal from the soft-coal mines of this country for 407,000,000 net tons, compared with a mine capacity estimated at 800,000,000 tons per year and more, and proven by several separate weeks' records to be in excess of 700,000,000 tons. With mines and miners ready and anxious to furnish two tons for every single ton for which there was a purchaser last year, there was sharp competition for business. The operators of non-union mines cut wages from the high peak to which they had been drawn by the union fields in 1920, and went after the business. The operators of union mines cut everything but wages, but they could not then and cannot now match coats with the fields where wages have been lowered.

Not only did the non-union operators and the non-union miners get the business in 1921 and the profits as well, but the cream of the 1922 business is already being tied up by the non-union fields by contracts at figures the others cannot meet. In all of the great region east of the Rocky Mountains those soft-coal operators who are bound by contract with the United Mine Workers are facing an impossible and intolerable position. They cannot meet the spot market prices and live, and the contracts they obtained early in 1921 prior to the deflation of wages in unorganized fields are expiring and are not being renewed. The continuation of present wages or even of wages approximately as high, with attendant costs, means that union mines will in 1922 work but to supply that modicum of tonnage over and above the full-time output of the non-union mines necessary to meet the reduced requirements of the country.

At Shamokin, Pa., last week John Lewis told the assembled delegates from the anthracite mine workers that they did not propose to measure their wages by the yardstick of the non-union worker. The operators who employ Mr. Lewis' constituents must needs, however, measure their prices against the yardstick of price established by the wages he scorns. Had no anti-trust laws ever been enacted, no union of coal operators could ever withstand the onslaught of lower-priced coal in the present market. Nor can the United Mine Workers. Although there are degrees, varying in intensity from East to West, in the grief caused by the competition of non-union coal, no union field is free from its influence. The employers of organized coal-mine labor must and will have lower wages. No argument, no plea, no wage commission, can surmount this basic economic need. Against this is the determination of the miners' union to resist a wage reduction, and it is plain why Mr. Hoover concludes that the stage is set for a strike.

Those who have already raised the demand for government intervention—a federal mediation board or what not—have not reckoned on all the facts. There can be no setting up of standard wages that does not include the non-union fields. It would be of small avail for a federal agency to attempt to adjudicate the all too apparent differences between the union and the operators with any hope of permanent and satisfactory settlement without bringing non-union wage scales—already in danger of being forced too low—into focus. The non-union operators, having won the right to freedom from the miners' organization, will resist as strongly any attempt by the public to regulate the wage scales they pay as they have the efforts of the union in the same direction. To bring the unorganized districts into mediation with the remainder of the country would be tantamount under present conditions to fixing minimum wage scales. There are so many reasons why such a solution is not feasible that it need not be discussed.

When the coal market was in the hands of the seller, union labor set the pace for all. Now that the market is in the hands of the buyer, non-union labor sets the pace. The other must follow. Many operators hold to the opinion that because the chances of success in the soft-coal fields are so slim, the union will not call a strike—that the mine workers will not take the risk. Coal specialists in the government service are said to believe that neither the operators nor the union officials really have at this time a true measure of the temper of the mine workers. Since this is likely to constitute an unknown quantity until the very eve of the expiration of the present agreement, they hold to the opinion that such an unknown quantity favors a peaceful settlement.

We anticipate for the bituminous industry a final settlement—however arrived at and when, by strike or otherwise—with union scales on a parity with the Washington agreement of 1917, the check-off eliminated, a number of changes in differentials (some important) and a contract for not to exceed one year. There is strong possibility also that several small groups will operate after April 1 without a contract.

Public Interest May Affect Anthracite Settlement

TURNING now to anthracite we find somewhat different conditions. The workers in the hard-coal region have already authorized their leaders to call a strike if no contract has been signed by the time the present one has terminated. These workers have enjoyed almost steady work at the highest wages ever received and are well fortified to resist a reduction. The pressure on the producers for lower selling prices on their product through lower wage costs is of different character from that affecting the soft-coal producers. There is no non-union anthracite to compete with that in Pennsylvania and bituminous coal at any price as a substitute is not an important factor as yet.

But the public, using hard coal in homes, knows prices are too high and, knowing, loudly calls for lower prices. These lower prices can come only through lower wage costs, hence there will be a demand that the hard-coal workers take a reduction in wages. The public will back the operators in this and will take an interest in the progress of negotiations to a greater extent than if only bituminous coal were involved. It is likely that, lacking a settlement prior to April 1, the chances for which do not appear any too favorable at this writing, public opinion will force intervention, either through a commission or by way of some agency set up by the passage of legislation of the Kenyon type. The bituminous coal operators and workers may be drawn in, even though their problem be of a different character.

SECOND THOUGHTS OFTTIMES DISCLOSE that things are not as bad as they had seemed. A study of exports in the first nine months of 1921 made by the United States Chamber of Commerce discloses the fact that although in terms of dollars our export trade has shrunk in both warp and woof, when measured in quantity—that is, in tonnage—ten out of twenty of the principal commodities show gains over 1920 and fifteen of the twenty were greater this year than pre-war.

Wheat, of course, leads the list, with nearly sixfold gain in tons over pre-war and 82 per cent over 1920. Corn exports were nearly twice pre-war and more than eight times those of last year. Other food products to record increases were lard, oil cake, and meal and barley. Crude and fuel oils also gained.

Coal and coke and iron and steel products were the principal commodities to show decreases from 1920. In general it will be seen that raw material gained, but those products requiring coal for refinement or fabrication declined. Most unqualifiedly the prosperity of the coal industry is tied up with our foreign trade in products requiring coal for their output, as well as in coal itself.

Steeply Pitching Coal Bed with Limy Roof and Floor, Which Weather Badly, Mined by Retreating Longwall

Usual Chute-and-Pillar System Failed Because Floor Heaved—Roads Driven in Floor of Mine—Ventilation Greatly Improved—Stepped Longwall Introduced and Mining Costs Much Lowered

BY GEORGE WATKIN EVANS
Seattle, Wash.

AT the Beaverhill coal mine a longwall system of mining has been introduced which is not essentially different from that commonly used except in the fact that it is applied to a pitching bed. The customary chute-and-pillar system signally failed to produce results.

The mine is located about twelve miles southwest of the city of Marshfield, in Coos County, Oregon, near the center of the lower half of a coal field somewhat oval in shape and covering an area of about 250 square miles. This coal field is approximately 180 miles in a direct line southwest of the city of Portland and borders on the Pacific Ocean at a point about 100 miles north of the California line. Beaverhill coal is well known to the older residents of San Francisco and in various places in Oregon, where it was quite popular prior to the time when Utah coals were first introduced into California and Oregon.

Mining men who conceived the original plan for opening and developing the No. 3 mine of the Beaverhill Coal Co. intended to drive the slope and all haulageways in advance and mine the coal by a sort of retreating system. In this respect their intentions were excellent, but they failed to take into account the character of the inclosing walls of the coal measure. Had the two walls of this coal bed been of a permanent and resistant character, the plan at first adopted would no doubt have achieved success.

WORKINGS LIE ON A DIP OF ABOUT 25 DEG.

Mine No. 3 has been opened on a coal bed about 6 ft. thick, which at the outcrop dips at an angle of approximately 40 deg. and at the bottom of the slope flattens to about 25 deg. In driving the main slope it was necessary to take into account the old workings of the No. 1 mine. Accordingly a single slope and return airway were driven on the bed until they reached a point about 100 ft. below the workings of No. 1 mine. Thence a slope and two return airways were driven for a distance of nearly 1,400 ft., at which point one slope and one return airway were continued to the bottom of the present main workings.

In all, the slope is about 3,000 ft. long and driven on the coal throughout this entire distance. Three gangways were driven on the north side of the slope and two on the south side, to the boundaries of the property. While driving these passages, in order to ventilate them, chutes were driven about every 200 ft., connecting the gangway with the one above so that it could be properly ventilated. Both gangways and chutes were driven in the coal in all cases.

This system no doubt would have proved satisfactory under almost any normal condition. Before the slope was finished, however, the bottom began to heave, and it became necessary to lift it in order that the cars might reach the foot of the slope. No sooner had the gangways been driven to the boundaries than it became necessary to begin lifting bottom at various points throughout their length in order to let the cars travel through the haulageways. The same condition was found to exist in the chutes.

As a result of this continuous heaving, caused by an excessive amount of lime in the two walls of the coal bed for a distance of 15 to 20 ft. above and below the coal, it became necessary to employ most of the workmen in keeping the haulageways open, and only a few of them could be used in actual mining. In fact it is reported that at times it was next to impossible to produce enough coal to keep the boilers at the mine properly supplied with fuel. As a result of this excessive squeezing, the cost of mining was exceedingly high, even when the mine was fully developed, and an attempt was being made to mine coal by a retreating system. Prior to 1920 for a period of two or three years the cost of producing coal ranged from nearly $6 to more than $13 per ton.

LONGWALL SYSTEM NOW IN USE FOR TWO YEARS

Beginning with 1920 the system of mining was changed from a chute-and-pillar to a longwall system. A new hoist was installed and the preparation plant, which had become obsolete, was replaced with more modern equipment, including an Elmore jig. The slope was found to be in bad condition, and bottom had to be lifted for a considerable distance. The return airway was in even worse shape and some rock tunnelling had to be done to keep the mine properly ventilated.

The gangways driven in the coal had been placed near the top of the bed, and as a result it was necessary to shovel the coal into the cars after it had reached the bottom of the chutes. In order

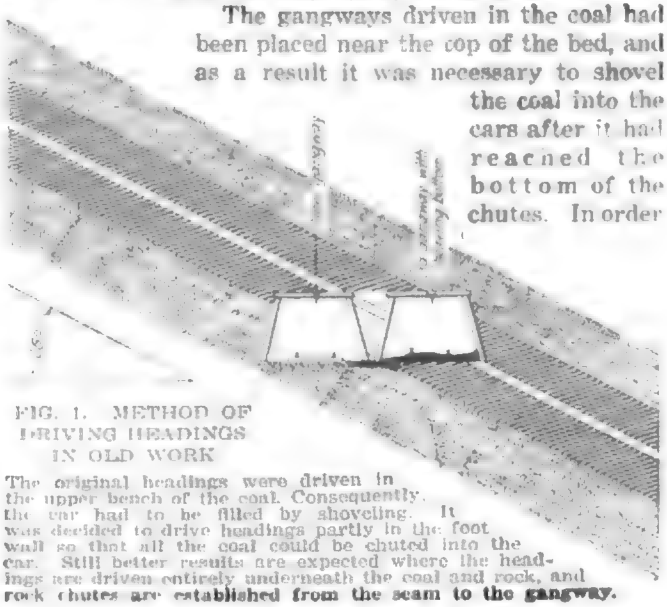

FIG. 1. METHOD OF DRIVING HEADINGS IN OLD WORK

The original headings were driven in the upper bench of the coal. Consequently, the car had to be filled by shoveling. It was decided to drive headings partly in the foot wall so that all the coal could be chuted into the car. Still better results are expected where the headings are driven entirely underneath the coal and rock, and rock chutes are established from the seam to the gangway.

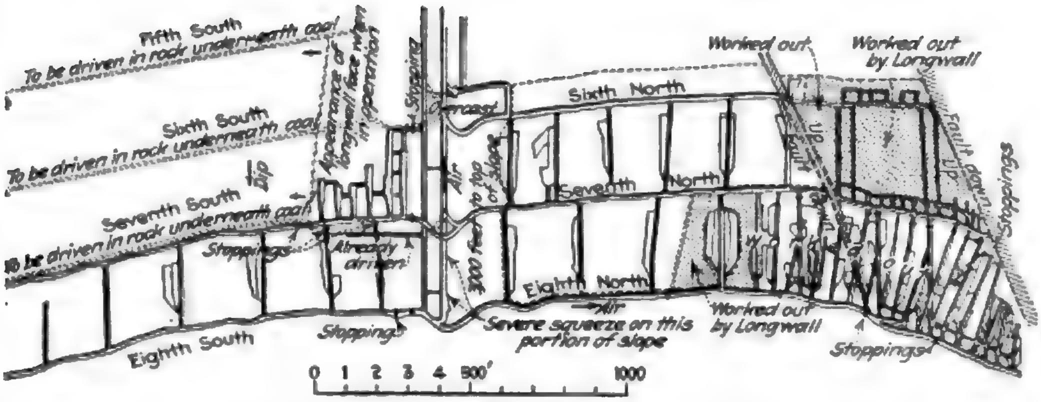
Fifth South
To be driven in rock underneath coal
Sixth South
To be driven in rock underneath coal
Seventh South
To be driven in rock underneath coal
Dip
Appearance of longwall face when in operation
Stopping
Stoppings
Already driven
Air
3000 feet to top of slope
Sixth North
Seventh North
Eighth North
Air
Worked out
Worked out by Longwall
Up
Fault
Fault down
Up
Stoppings
Eighth South
Stoppings
Severe squeeze on this portion of slope
Worked out by Longwall
Stoppings
0 1 2 3 4 500' 1000

FIG. 2

Beaverhill Mine

That part of the plan that is in solid lines was driven before the mining system was changed from one having gangways partly in the head wall and chute-and-pillar workings to one having gangways partly or wholly in the foot wall and stepped longwall operation. The old workings are proving quite a handicap to cheap and efficient extraction.

to overcome this difficulty it was necessary for the new management to redrive the gangway in the rock below the coal, so that the bottom of the bed at the gangway would be above the top of the coal car. This work, of course, entailed the expenditure of much money. As previously indicated, the system of mining was changed to a modified longwall. By this means the working faces are carried horizontally toward the slope in steps about 25 ft. in length, each of which is 6 ft. in advance of the one immediately adjacent to it up the pitch. This arrangement is clearly shown in Fig. 3. A sheet-iron chute is carried as close to the face as practicable, so that the miners can load the coal into it. The longwall face is timbered by means of posts and caps on about 5-ft. centers.

In some instances collars also are used. In places where the roof threatens to break too close to the working face, cogs or cribs are used to take the squeeze. In this manner it is possible to cause the roof to break from 20 to 40 ft. in the rear of the working face. If, as sometimes happens, the span becomes too great, the roof is broken by placing a few shots in it. In most instances the bottom squeezes tight up against the roof within 20 to 30 ft. of the longwall face.

A parting of shale about 8 in. in thickness is found near the center of this coal bed. An effort is made to gob this under the present system of mining, which was not practicable with the chute-and-pillar system. Little powder is used under present conditions, advantage being taken of the squeeze to bring the coal down. As a result a large percentage of lump is produced.

LONGWALL HAS IMPROVED MINE VENTILATION

With the former system of mining it was almost impossible to ventilate the working faces properly, most of the difficulty arising from the fact that the chutes would close if the bottom was not properly and continuously lifted. This, of course, restricted the areas of the return airways. As may be seen in Fig. 3, with the present system of mining the full volume of air is conducted down the slope, then along the lower gangway, thence up the working faces of the longwall system, then to the return airway and back to the exhausting fan on the surface.

One of the difficulties—and it is rather a serious one—which has been inherited from the old system is that the longwall face is disturbed and comes to an abrupt end when the old chutes are encountered. This entails the expense of reopening the longwall face. If the coal were solid, it would be easy to continue the mining up to the slope pillar without break, thereby much reducing the present cost of mining. Under the old system of working, mine fires were frequent, and numerous stoppings are shown on the old mine map where large areas have been sealed off because of fires originating from spontaneous combustion. With the present system of longwall working, fires are reduced to a minimum, occurring only when one of the old chutes is encountered, this rendering it impossible completely to mine out the coal.

During the month of October the longwall system proved itself to be much more efficient in the event of a mine explosion than the old chute-and-pillar system. On Oct. 14 an explosion occurred in which fourteen men were burned and eight gassed. Two of these men were in a chute, twelve were on a longwall face and four were in the upper gangway. All eighteen, although

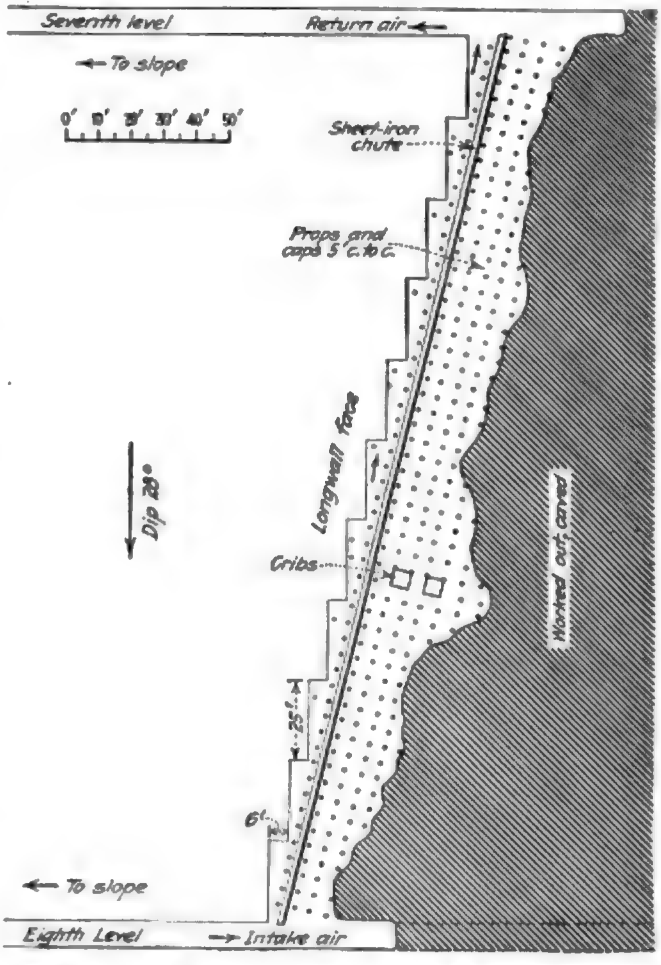
Seventh level
Return air
To slope
0' 10' 20' 30' 40' 50'
Sheet-iron chute
Props and caps 5' c. to c.
Longwall face
Dip 28°
Cribs
Worked out, caved
25'
6'
To slope
Eighth Level
Intake air

FIG. 3. PLAN OF LONGWALL FACE IN OPERATION

The steps are 25 ft. wide with 6-ft. offsets between them. Full advantage is taken of the 28-deg. fall which enables a sheet-iron chute about 300 ft. long to be used to deliver coal into the car. The grade makes it easy to convey the coal. The roof settles 30 or 40 ft. away from the longwall face.

some of them were severely burned and some were badly injured by falls of rock, were on the surface receiving first-aid treatment within 2 hours and 45 minutes from the time the superintendent was notified of the accident.

This contrasts markedly with an explosion that occurred when the old system was in use, wherein four men were burned and all four were dead before the rescuing party could reach them. With the longwall system of mining the rescuers followed the fresh air into the mine and were able to reach the men without the use of apparatus. The men working in the explosion zone were not overcome by afterdamp, because a full volume of fresh air was established immediately following the explosion.

It might be well to explain that the explosion in question resulted from the gross carelessness of one of the most experienced miners in the employ of the company. This man opened his safety lamp at the top of a chute which was filled with gas, and in attempting to relight it with a match started the fireworks. Fortunately a booster fan supplied him and a companion with sufficient fresh air so that they could reach the main haulageway, where they encountered the full volume of the ventilating current.

By referring to the illustrations accompanying this article the reader can readily visualize the system used. It will be noticed that a skip 6 ft. wide is driven up the full pitch of the coal bed. When this has been extended 25 ft. from the gangway, another skip, also 6 ft. in width, is started, and when these two have each advanced 25 ft. a third is started, and so on. In this manner the skips are driven up the pitch, each face being 25 ft. ahead of the one next down the dip. Fig. 3 clearly portrays this procedure, so that further description is unnecessary.

The Beaverhill mine is capable of producing about three times as much coal as the market at present will absorb. The demand, however, is abnormally low this season, because of the cheapness of wood in western Oregon. Even with the small production, the cost of mining has been reduced to about $3.30 per ton. With production at capacity this figure doubtless could be lowered still further.

A thousand tons a day could be mined by this system, if the market warranted such an output. The production of the mine is limited, however, by the fact that only a single-track slope is available for coal withdrawal, and the heavy dip near its top limits the number of tons the hoisting engine can haul at one trip. These disadvantages, however, could be remedied if the market requirements demanded such improvements.

I have taken but a small part in bringing about the change in the mining system adopted at the Beaverhill mine. The bulk of the credit for transforming this operation from a non-producer to a producer, when the task seemed hopeless, belongs to J. J. Corey, superintendent of the mine, who has worked out the details on the ground. This experiment has proven conclusively that on pitching beds where the ground squeezes too badly to permit the use of the chute-and-pillar system, longwall can in many instances be employed to advantage.

If I were called upon to open a property of this nature from the outcrop, and were satisfied that a definite market existed for the product of the mine up to an appreciable tonnage per day, I would not hesitate to drive the slope in the solid rock at a distance of 8 or 10 ft. below the troublesome ground, then drive the gangways through the rock at a reasonable distance from the coal and connect them at intervals of about 50 ft. with the longwall face by means of rock chutes. The first cost of driving a slope would be greater than if it were driven on the coal. The same is true of the rock gangways, but the upkeep would be small compared with the expense to which the company above mentioned has been put in trying to keep the Beaverhill slope and gangways open. Furthermore there would be no limit to the speed with which cars could be hauled along the gangways or the slope so far as the tracks were concerned, because they could be properly aligned and ballasted and kept in good condition without much trouble.

Either an Oversize or a Ventilated Motor Needed for Steady Locomotive Operation

By W. A. Clark*
East Pittsburgh, Pa.

UNTIL recently all motors intended for use on mine locomotives were totally enclosed and the case made as nearly dustproof as possible, the idea being to protect the commutator, brushes and windings from coal dust. It was thought that such dust had a tendency to cause short-circuits and grounds that would shorten the life of the commutator.

The motors selected for use upon any given weight of locomotive are given normally a one-hour rating greater than that required at 25-per cent track adhesion. This insures their having a short-time capacity sufficient to accelerate any load within the slipping point of the drivers. The amount of work that a locomotive is capable of doing in a day depends, however, on the continuous capacity of its motors and not on their rating for one hour. The one-hour rating of the motor is measured with the covers off the locomotive, and in accordance with the other standardization rules of the American Institute of Electrical Engineers. It depends principally on

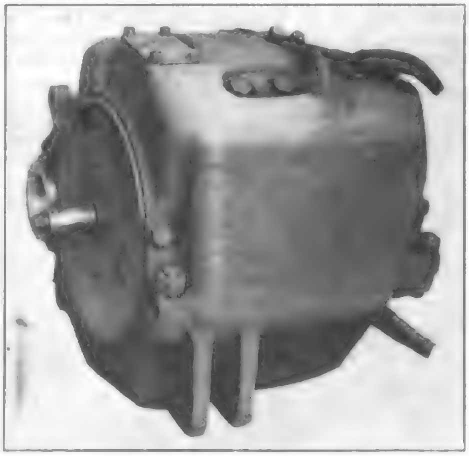

FIG. 1. AN INTERNALLY VENTILATED MOTOR

Such a motor should be so enclosed that the air will be compelled to follow a certain direction. To blow air on a motor without such a precaution in a degree would be as foolish as to blow air in a mine without air courses specifically provided.

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*General engineer, Westinghouse Electric & Manufacturing Co.

thermal capacity (or mass) and to a slight extent on radiation and ventilation.

Continuous motor capacity, on the other hand, is measured with covers arranged as in service. This means that with a totally enclosed motor there is little ventilation, and the rating will depend largely upon the area of the radiating surface. The ratio of continuous rated amperage to the one-hour rated amperage, which usually is 25 to 50 per cent, will depend on the ratio of the total radiating surface to the mass, being a larger ratio on the smaller machines, as the larger the motor the smaller is the surface in proportion to the volume or mass.

Gathering locomotives usually are supplied with small motors. When gathering cars, the locomotive for a large part of the time is standing, running light or hauling only one or two cars, so that the average current consumption is relatively low. As a result a motor applied to a locomotive on the basis of the hour rating usually has sufficient capacity to perform the required service. In haulage work, on the other hand, where the hauls are long with grades against the loads, it may be necessary either to use a larger motor than the weight of the locomotive would demand, in order to assure sufficient continuous capacity, or else to find some way of increasing this capacity.

FAN WILL INCREASE CONTINUOUS CAPACITY

One way to increase the continuous capacity of a motor is to apply forced ventilation. This is accomplished on a mine locomotive by mounting a motor-driven blower on the machine and piping the air to one—usually the pinion—end of each motor, and arranging an air outlet on the opposite end. The air in passing through the motor absorbs and carries away much of the heat of the armature and field coils. This raises the continuous capacity to from 70 to 80 per cent of the hour rating.

Forced ventilation does not increase the one-hour rating of a motor because, according to the standardization rules of the American Institute of Electrical Engineers, the rating is measured with natural ventilation. A motor with forced ventilation, however, is equivalent in service to an inclosed machine of approximately double its rated horsepower. It has been found in operation that air carries away as much coal dust from the motor as it carries into it and that a machine that is operated with forced ventilation usually is cleaner inside than is one that is totally inclosed. Fig. 2 shows a blower with its motor and piping installed on a locomotive.

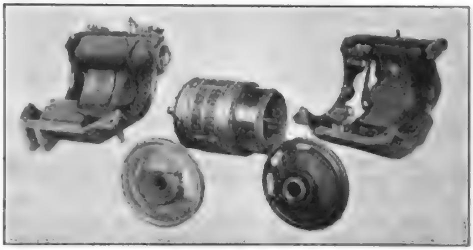


FIG. 3. SELF-VENTILATED MOTOR DISASSEMBLED
The openings in the end plates and the baffles which direct the air may be seen in the illustration.

Another way to increase the continuous capacity of a motor is to arrange it for self-ventilation. The Westinghouse Electric & Manufacturing Co. has adopted this idea on one of its motors. This machine was designed with longitudinal ducts through the armature and a fan on its pinion end. Operated inclosed this fan circulates air through the motor, drawing it in through the commutator and core and returning it through the field to the point whence it came.

This efficient internal ventilation gives a continuous capacity in amperes of more than 40 per cent of the hour rating. By substituting ventilated for inclosed housings, the continuous capacity is increased 20 per cent. These ventilated housings are provided with baffle plates that so direct the air that it enters through the openings at the commutator end, passes under the commutator through the core and fan and out through the housing on the pinion end. The air does not touch any of the live parts such as brushes, commutator or windings. Figs. 1 and 3 show this motor both assmbled and taken apart. The openings

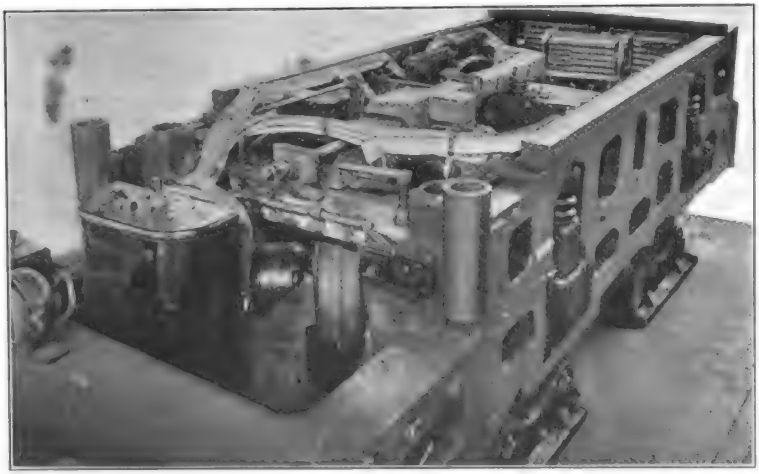


FIG. 2.

Locomotive with Covers Removed

Shows near controller the motor for driving the fan, the air duct bringing air to the fan eye, the fan itself, and on the top of the locomotive the rectangular ducts by which air is conducted to the motors. Ventilation does not increase the motor's rating, which is based on its capacity with natural ventilation, but it does raise immensely its real ability to run continuously at high duty.

in, and the baffle plates upon, the housings can be seen in this latter figure.

In order to test the efficiency of this equipment, two locomotives were put in service in the same mine at the same time, one fitted with motors with ventilated housings and the other equipped with motors totally inclosed. After several years of service the motors with ventilated housings were cleaner and their commutators were in better shape than those of the inclosed motors.

Where the service is particularly severe, forced ventilation can readily be applied to a motor of this type. As the blower will be assisted by the fan on the pinion end of the armature, the combined ventilation will be highly effective. In such a case an inclosed housing is used on the commutator end and a ventilated housing is installed on the pinion end. The air entering at the pinion end passes through the field coils and over the armature surface to the commutator end, thence through the commutator and armature core to find its way out at the pinion-end housing.

Nova Scotia Plan for Operating Weigh Pan

By John S. Watts
New Glasgow, N. S., Canada

A weigh pan dumped by the weigh boss, through the medium of an electric magnet, which controls a brake wheel is described on page 617, of Coal Age, of April 7, 1921. In my opinion the arrangement used in this district for this purpose is a more efficient one, and less likely to get out of order.

The general idea of the mechanism is shown in the accompanying drawing. It consists of an air cylinder of the required diameter and stroke which, when compressed air is admitted on top of the piston, will pull down the lever and open the gate on the weigh pan. The gate is closed when the air pressure is released, by the counterweight shown.

The cylinder is absolutely plain, being merely a cast-iron pipe bored out and fitted with a blank flange at the lower end, and a cover with a gland for the piston rod on the top end. At the top is a hole drilled and tapped for a ⅜-in. air pipe, and a small hole is drilled in the bottom for permitting the air to escape from under the piston as it comes down.

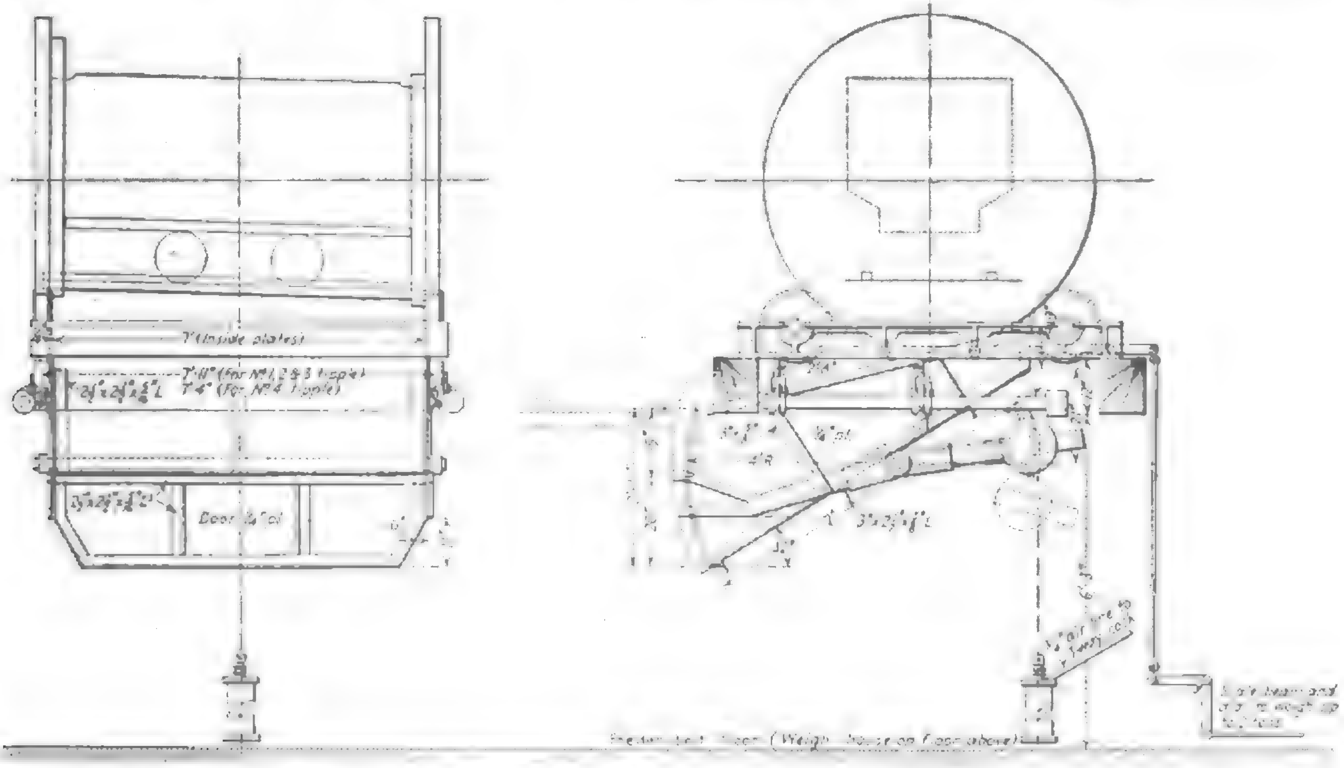
Weighman at Desk Puts Dump in Operation

The air pipe is carried to a point convenient to the weighman's desk, and is there fitted with a three-way cock, which when set one way will admit air to the air cylinder, and so operate the weigh-pan gate, and when the cock is reversed will allow the air to escape and so permit the balance weight to close the gate.

The piston usually is fitted with a cup leather, to make it airtight, but some prefer a plain solid piston, which will stay airtight for a long time if at the beginning it is made to fit in the cylinder closely.

This arrangement can be adapted to suit all types of weigh pans, is quite simple to apply, and can be depended on to perform its functions under the most severe treatment. I have seen one operating successfully when buried in a pile of coal, the only part visible being the rope leading to the lever on the weigh pan.

I consider this apparatus more serviceable than the electromagnetic type, as it is more simple, has nothing to get out of order, can be made and installed by any mechanic, and requires scarcely any attention. It is just as adaptable as the electric mechanism and can be operated from any reasonable distance, just as readily.*



WEIGH PAN WHICH A WEIGH BOSS CAN READILY DUMP FROM HIS DESK BY MEANS OF AN AIR CYLINDER

An air cylinder of the required diameter and stroke, the piston of which is lowered when air is admitted, furnishes the means for putting down the lever and opening the gate of the weigh pan

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*The writer does not say what is to be done when compressed air is not available, nor does he refer to the difficulties with compressed air during cold weather.—Editor.

Can Anthracite Mines and Preparators Be Operated with Advantage on More Than One Shift Per Day?—I*

Multiple Shifting in Mines Would Make Necessary Relays of Men in Each Working Place or Working Mines in Sections and in Mines and Breakers Would Increase Number of Men Required to Produce a Given Tonnage

By Dever C. Ashmead†
Kingston, Pa.

METAL-MINE engineers have frequently wondered why anthracite mines and their preparators are rarely operated on double or triple shifts. One of the reasons is that the adoption of any such plan would bring about difficulties with the colliery employees, for they have never worked on that plan and would show their resentment by suspending work. Even if they could be induced to take part in maintaining this full schedule they would not be as efficient as at present, for they would be working more or less unwillingly at hours during which they are accustomed to rest.

Operation on a three-shift basis would necessitate the triple manning of each working place, and dissensions would arise between the men, for each shift would assert that the men on the preceding shift had taken undue advantage of them and had not left conditions as favorable as they had found them on commencing work.

To obviate these disputes it might be necessary to let out the work to a contractor who would hire his own helpers to mine out the chamber, or breast. The state mining law requires that a miner be put in charge of each working place. To conform with this provision in the law he would have to hire three helpers and two miners to work the breast. The labor unions have been trying to abolish the subcontractor in mine work, and any method of working that would cause his return, however innocent in purpose, would result in labor disturbances.

Triple Shifting Involves Partnership

It might be possible to form partnerships of three miners working in a place together, but these men would be quite likely to have frequent dissensions as to the proportion of work performed by each shift. Only one other method of working remains—operation by company men, but this is ordinarily too expensive to be considered.

Before leaving the question of the relation of labor to the three-shift operation of anthracite mines it would be well to call attention to the fact that the state mining law says that before he can become a miner a man shall have two years' experience and then pass an examination. This limits the number of miners available, and if all of the anthracite collieries were to go on a three-shift basis there would not be enough men to fill the working places.

The development work in those parts of the mine in which there is still first mining is, even now, often on the three-shift basis. It is only with difficulty that this development work is kept sufficiently far in advance of the coal-mining forces to keep them supplied with working faces and with production on all three shifts there would be no way in which the development could be maintained.

Second mining would seem, however, free from this drawback, but experience shows that it is difficult to maintain the output from those mines or portions of mines where production is from second mining, because it is frequently necessary to reopen closed places, to re-lay tracks, clean falls, and in places to penetrate squeezed areas, and because time must be allowed at frequent intervals for the settlement of disturbed measures so as to minimize the dangers to those who are working at the face and because special conditions, such as overlying workings or the necessity for partial or complete support of the surface and surface buildings, often limit the location and extent of second-mining areas.

If it were possible to divide the miners into three shifts and work three parts of the mine integrally, one in each shift, the objection that contract work

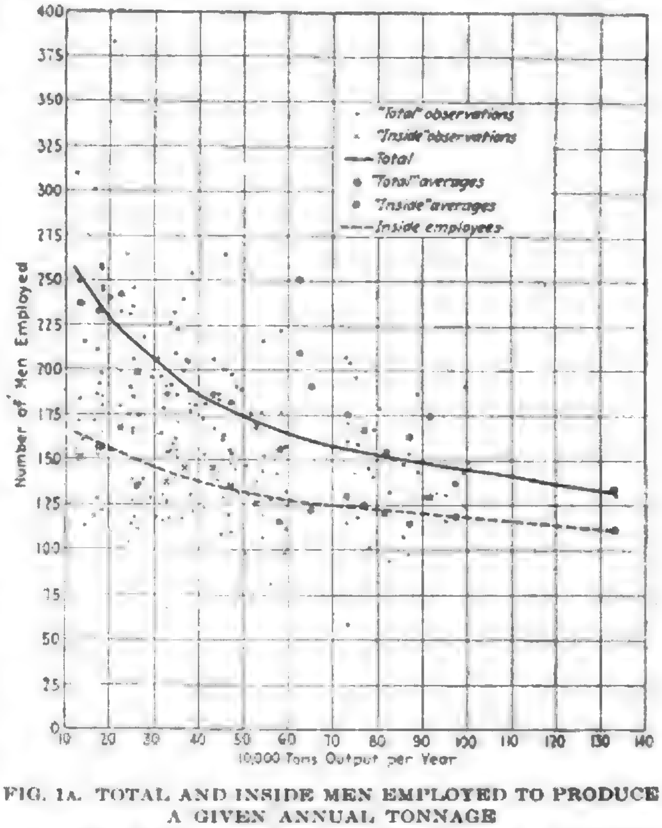

FIG. 1A. TOTAL AND INSIDE MEN EMPLOYED TO PRODUCE A GIVEN ANNUAL TONNAGE

In reading the number of men employed it should be understood that the number of men recorded is the number per 10,000 tons of output per year and not the gross number. Thus where 900,000 tons per year are produced the force of inside men is 90 x 12.1 or 1,089 men.

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*Article entitled "Can Anthracite Mines Be Operated Profitably on More than One Shift?" to be read at the February meeting of the American Institute of Mining and Metallurgical Engineers, New York City.

†Anthracite Editor, Coal Age.

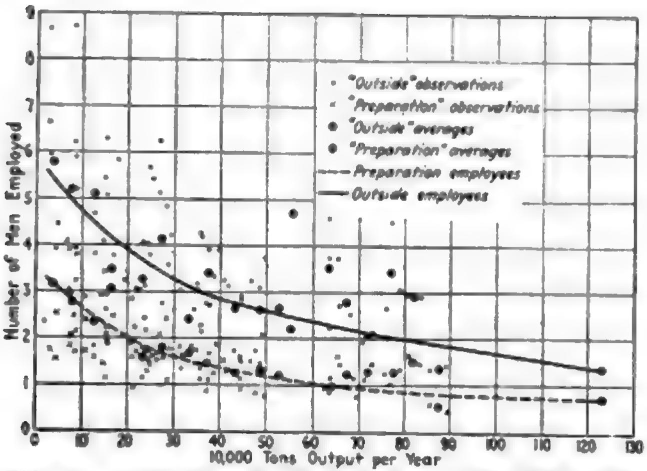


FIG. 1a. OUTSIDE AND PREPARATOR MEN EMPLOYED TO HANDLE A GIVEN ANNUAL TONNAGE

Here again the number of men is based on the tons of output per year in ten-thousands of tons. A preparator with an output of 60,000 tons a year will require three men per 10,000 tons, whereas one with an output of 1,000,000 tons a year will manage to get along with about 0.8 of a man per 10,000 tons.

would be necessary would be removed, for with this arrangement every miner would still have his own place. But it would not be possible to get the efficiency now obtained, for two-thirds of the men would be working on off-shifts and their willingness to work would be decreased.

But, overlooking all this and assuming boldly that it is possible and might be desirable to divide the miners among the morning, afternoon and night shifts, there would not be enough company men to go around. After all is said the miners and their helpers constitute only 30 to 40 per cent of the men employed and the others make up the remaining 60 to 70 per cent. The difficulty would therefore be in making this force of men handle the duties of all three shifts. In order to deal intelligently with this subject it will be necessary to make a careful analysis of the various types of underground workers at collieries.

DEVELOPMENT NOW AT MAXIMUM CAPACITY

In this inquiry the men at work at development may as well be omitted, for their number can hardly be increased, as even at present the advance work is often conducted during three shifts of each day. So, omitting development men, who are included among the miners and their helpers, the number of underground workmen at four different collieries is as shown in Table I.

With the introduction of the triple shift no increase would have to be made in the number of pumpmen. This, however, is a small item, as Mine No. 1 has only two men, Mine No. 2 only four men, Mine No. 3 only eight men and Mine No. 4 only seven thus engaged.

Another class of men that would be but little affected if the mines were worked in sections comprises the foremen and their assistants. Where there is but one opening the number of foremen, of course, would have to be increased, as there would have to be one man in charge of each shift, but where there is more than one opening a foreman usually has been already assigned to each.

Consequently, if each opening or some combination of them were put on different shifts the number of foremen would not be increased. This is clear from Table I, for there is a foreman in charge of each opening. Ordinarily, however, with three shifts a somewhat greater number of foremen would have to be engaged.

TABLE I.—UNDERGROUND FORCE AT FOUR ANTHRACITE COLLIERIES

	—Mine No. 1—			Mine No 2	——Mine No. 3——				Mine No. 4
	Opening No. 1	Opening No. 2	Total	Total	Opening No. 1	Opening No. 2	Opening No. 3	Total	Total
Cutting and loading									
Contract miners	106	133	239	147	54	89	60	203	321
Contract laborers	5	3	8	27	15	12	8	35	194
Company miners	11	22	33	...	3	...	...	3	9
Company laborers	12	10	22	...	3	...	...	3	33
Total cutting and loading	134	168	302	174	75	101	68	244	557
Ventilation									
Door tenders	2	5	7	11	7	4	5	16	...
Brattice men	1	5	6	5	3	2	2	7	9
Masons	...	...	...	3	2	...	2	4	7
Safety-lamp men	...	1	1	...	...	...	...	...	2
Total ventilation	3	11	14	19	12	6	9	27	18
Transportation									
Stationary engineer	...	...	...	...	4	4	2	10	3
Shaft, slope and plane attendants	3	2	5	14	11	9	5	25	21
Locomotive engineers	6	...	6	...	2	...	...	2	...
Drivers	8	15	23	27	18	18	15	51	35
Runners and spraggers	...	3	3	30	20	13	8	41	29
Electric motormen	...	...	...	...	...	...	...	...	14
Motormen's helpers	...	...	...	...	...	...	...	...	16
Road cleaners	2	2	4	5	...	...	...	...	10
Trackmen	3	7	10	14	6	6	...	12	13
Stablemen	1	1	2	1	1	...	4	5	...
Shoers	...	...	...	1	1	...	1	2	...
Pulleymen	...	...	...	2	...	...	...	...	2
Total transportation	23	30	53	94	63	50	35	148	143
Pumpmen	2	...	2	4	5	2	1	8	7
Miscellaneous									
Rockmen	...	...	...	...	...	...	3	3	12
Rock stowers	...	...	...	...	4	4	5	13	...
Timbermen	...	3	3	9	7	7	1	15	...
Machinists	...	...	...	2	2	...	1	3	5
Electricians	...	...	...	...	...	...	...	...	1
Siltmen	...	...	...	9	6	...	...	6	21
Others	...	...	...	...	...	...	...	...	6
Total miscellaneous	0	3	3	20	19	11	10	40	45
General									
Foremen	1	1	2	1	1	1	2	4	8
Assistant foremen	6	10	16	10	6	3	5	14	10
Driver bosses	...	...	...	...	...	...	...	...	2
Timekeepers	...	...	...	...	...	...	...	...	2
	7	11	18	11	7	4	7	18	22
	169	223	392	322	181	174	130	485	792

The men engaged in maintaining the ventilation of the mines are more numerous. Thus Mine No. 1 has fourteen; Mine No. 2, nineteen; Mine No. 3, twenty-seven, and Mine No. 4, eighteen. If the mine were placed on three shifts the number of men would have to be increased somewhat, as it would be necessary to have men working on the ventilation in every shift, so that promptness in making repairs would be assured.

The doorboys would have to be more numerous, for

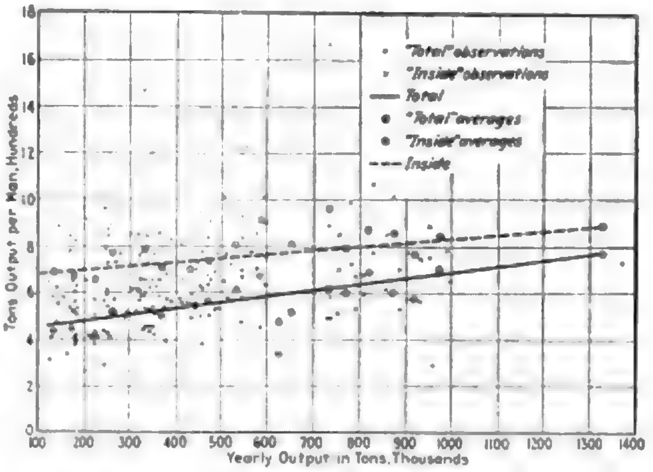


FIG. 2a. OUTPUT PER MAN AND PER INSIDE MAN IN MINES OF VARIOUS SIZES

The tonnage per employee and per underground worker increases quite definitely with the size of the mine. At a mine producing 100,000 tons a year the output per employee is apt to be about 440 tons yearly. At one producing 1,000,000 tons a year the figure will be about 680 tons.

even if the mine worked in sections, parts of the haulage systems would be used in connection with more than one section and boys would have to be supplied at the doors in these roadways during two or even possibly three shifts. It is not unlikely that it would be found that the force engaged in obtaining proper ventilation would be increased 50 per cent by the trebling of shifts.

It is in the solution of the transportation problems incident to the triple shift, however, that the biggest difficulty would be encountered. The simplest condition would be where there are several independent openings.

These might possibly be so grouped as to make it possible to work them in three shifts, using only the same number of men as are now employed on one. This, however, would be an unusual condition. In most cases there would be a mine with a long roadway along which all or a large part of the coal, no matter in what section it was produced, would have to be hauled. Some of the workings in that mine consequently would have to be allotted to one shift and some to another. It might be necessary to put the workings in one or more beds on one shift, to place the workings in one or more other beds in a second shift and to operate the rest of the beds in the third.

USE OF ROADS FOR THREE SHIFTS COSTLY

Here the transportation force would be increased greatly. It might well be necessary in both cases to increase considerably all the transportation employees, hoisting engineers, headmen and footmen, doortenders and their like. Only the men taking coal from the batteries or the face and hauling it to the parting or partings which the section or sections served and the door tenders in that section or sections would remain equal in number to those who transported the coal and tended the doors prior to the change.

In this case the three-shift operation might well involve an increase in the transportation force of 150 per cent without any compensation derivable from larger tonnage. The trouble today in the anthracite region is that sections of the transportation system are not, and cannot be, worked to capacity, and any dilution of the traffic by the introduction of the three-shift system would merely intensify a condition which is even now sufficiently crippling.

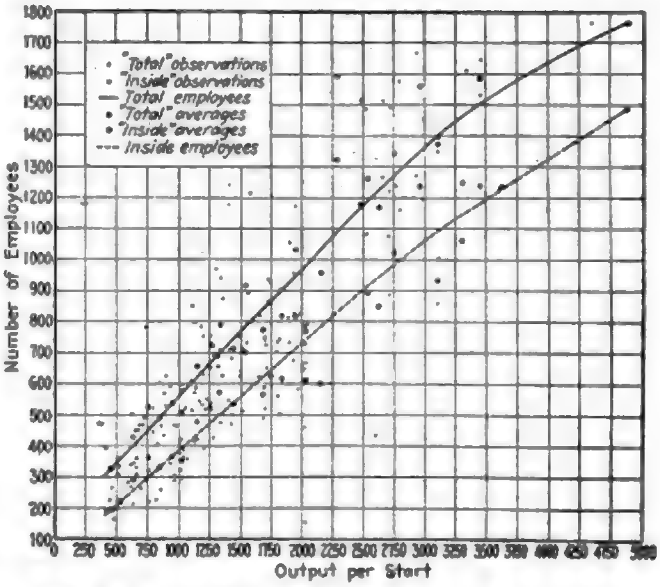


FIG. 3A. RELATION BETWEEN TOTAL AND INSIDE EMPLOYEES TO OUTPUT PER START

This chart is based on actual running and the number of employees plotted is actual and not figured in proportion to the output of the colliery as in Figs. 1a and 1b.

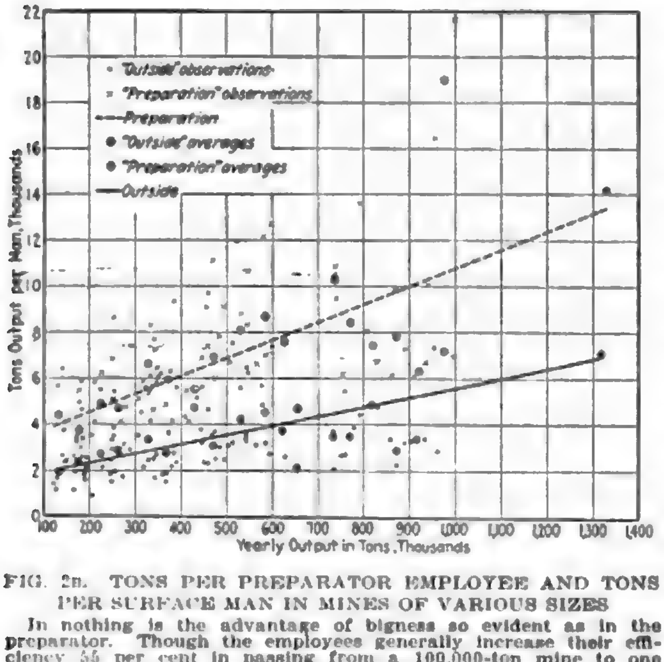


FIG. 2B. TONS PER PREPARATOR EMPLOYEE AND TONS PER SURFACE MAN IN MINES OF VARIOUS SIZES

In nothing is the advantage of bigness so evident as in the preparator. Though the employees generally increase their efficiency 55 per cent in passing from a 100,000-ton mine to one producing 1,000,000 tons yearly, the preparator employees treble their effectiveness by a similar change and there is no hint that there is a limit to this condition.

In those mines where silting is practiced the three-shift plan would make it necessary to silt on all three shifts, provided that the preparation equipment and the mine were run with equal continuity. This would mean increasing the force almost 200 per cent with only the same output and the same amount of silting accomplished. It is true that the building of batteries to retain the silt and the laying of silting lines would not involve any more work for three shifts than for one and, therefore, the cost would not increase proportionately to the number of shifts.

As may be expected, some relationship can be shown between the outputs of collieries and the number of men they employ. In order to show the effect of the output on the number of men employed, nineteen curves have been compiled from data received from 90 collieries the total output of which is 44,205,896 tons annually. The data from each colliery were plotted separately and an average struck for each 50,000 tons increase. These latter points were indicated on the charts by circles. Curves were then drawn giving due weight to these subaverages considering the number of observations involved in each. The high or low points apparently neglected are usually from meager and often single observations or from known abnormal conditions. The curves are intended to represent general conditions and not individual cases.

Fig. 1a contains curves showing the total number of men employed per 10,000 tons of yearly output and the number of inside employees. Fig 1b has curves which show the number of outside and preparation employees employed for 10,000 tons yearly output. These four curves show that a decreased force of men is required per unit of production as the output increases. They further show that the preparation forces per ton produced decrease in number with increased output faster than those in the other two departments.

Fig. 2a and 2b consist of four curves which show the output per man employed. These curves show how

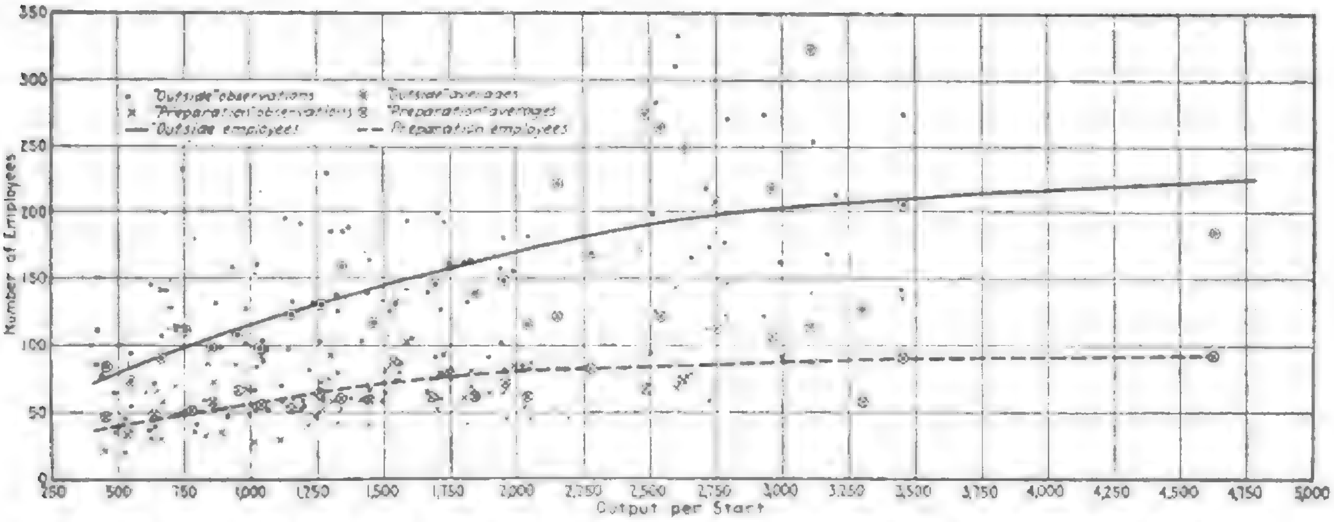


FIG. 3b. RELATION BETWEEN OUTSIDE AND PREPARATION EMPLOYEES TO COAL HANDLED PER START

It will be noted that the line showing the number of preparator employees parallels the base line from about 3,500 tons to about 4,300 tons per start. Thus the same number of men can handle coal in the preparator regardless of the amount. They have become tenders, not workers, and the number of machines tended and the size of them are matters of no moment.

the output per man increases as the collieries increase in size. Figs. 3a and 3b show the number of men employed per start in collieries of various capacities. Figs. 4a and 4b show the number of men employed by collieries of different yearly outputs. Fig. 5 gives curves constructed from the preceding charts which show the total number of employees for any given output which would be employed when the mines were run on one, two and three shifts.

These charts furnish the necessary data for a reasonably accurate analysis of the subject under discussion, when the output is divided in three and the full output is produced in three shifts instead of one. Take first the operation of a mine having a capacity of 900,000 tons per year or approximately 3,200 tons per shift, assuming 280 starts per annum, which is the average number of starts of the 90 collieries considered.

LARGE MINE GIVES LARGE TONNAGE PER MAN

It is now to be operated at the same tonnage but to have an output of only 1,070 tons in each shift. Referring to the curves in Fig. 1a it will be seen that for the larger mine it requires 12.1 inside employees per 10,000 tons annual output as compared with 14.7 inside employees for the mine with the same output but operating on three shifts.

Multiplying by 90, it will be found that the mine which would have produced its 900,000 tons with 1,089 inside men will now take, when operated on three shifts, 1,323 men to attain the same production. Thus the output, after the division of the work, will be attained by the employment of 234 more inside men than before, provided, of course, the personal efficiency of the men is unaffected by the change, which, as has been seen, is not likely to be the case.

The curve in Fig. 2a shows the output per inside man for mines of different sizes. A mine producing 900,000 tons per annum would have an output per man of 815 tons per year. In a mine one-third the size the output would drop to 710 tons. The difference is 105 tons per man, which is the loss in output sustained where the larger mine is operated on a three-shift basis. Thus, at the larger mine working one shift per day there would be 1,104 inside men and at the smaller mine working three shifts a day 1,268 inside men.

From Fig. 3a it is seen that the larger mine would produce its tonnage at the rate of 3,200 tons per start with 1,120 inside men, whereas the smaller mine running at the rate of 1,070 tons per start would have 410 men. Running the smaller mine three times as many shifts to get three times the tonnage, the equivalent force of men would not number 1,120 but 1,230 inside men.

Fig. 4a shows the number of men employed in direct relation to the number of tons produced, not taking into consideration the number of starts. Here the mine with 900,000 tons of annual output would employ 1,118

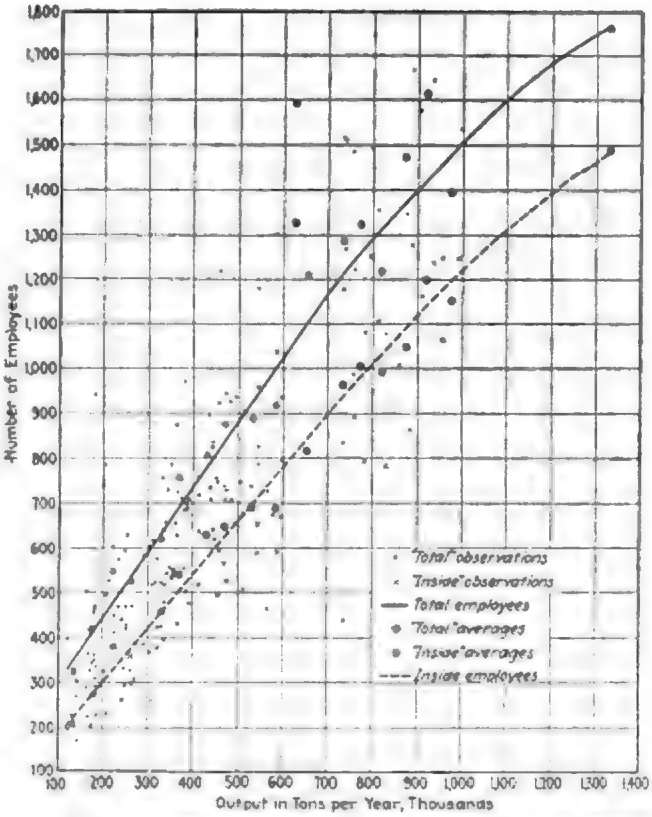


FIG. 4a. RELATION OF TOTAL AND INSIDE EMPLOYEES TO OUTPUT IN TONS PER YEAR

At a colliery producing 100,000 tons per year, 300 men are required, and at one producing 1,000,000 tons, 1,500 men. Thus five times as many men produce ten times as much coal. All of which testifies to the greater effectiveness per labor unit of the big mine.

inside men whereas the mine with 300,000 tons of annual output per shift would employ 416 men, the larger mine producing 900,000 tons per annum from three-shift operation as against one that would require three times 416 men, or 1,248 inside men.

These figures show a slight discrepancy, which is due to the different methods by which they are compiled. In some cases the time feature is considered and in others it is not, so the probable result will be an average of these figures, which is 1,108 for the one-shift operation and 1,267 for the three-shift mine, an addition of 159 men to the force.

Coal preparators are not designed to work on the three-shift system. The anthracite preparator involves a complete and very complicated flow sheet. If undue and unnecessary duplication of machinery is to be avoided, many of the machines must be of very large capacity and few of the machines can be stopped for repairs without disarranging and usually stopping the entire process. In this it differs from the metal mills, in which there are a large number of similar machines, which can be stopped and repaired without materially reducing the output. Under the present system of preparator operation it is possible to examine all the equipment every night and see that it is in proper shape, and if not, have it in working order in time for the next morning's start.

Lowered Output; Nearly Halved Efficiency

If the preparator is already built, the proposition that it be run on three shifts instead of one without correspondingly increasing the output is, of course, unreasonable. I know of one mining operation in the anthracite fields where the output has fallen from more than 1,000,000 tons a year to about 350,000 tons. When the preparator was cleaning and sizing the larger output ninety-three men were required, but that number is reduced to fifty-six by reason of the reduced production. Thus the output has decreased 65 per cent, but the number of men needed to handle it has dropped only 40 per cent, showing for the smaller output but 60 per cent of the original efficiency.

From the foregoing it is apparent that the number of men in the operation of a preparator does not decrease in direct proportion to its output, and it is probable that the ordinary rate of decrease is much smaller than in the example quoted, for improvements have been made in this preparator which have decreased the number of men required to operate it entirely irrespective of the output.

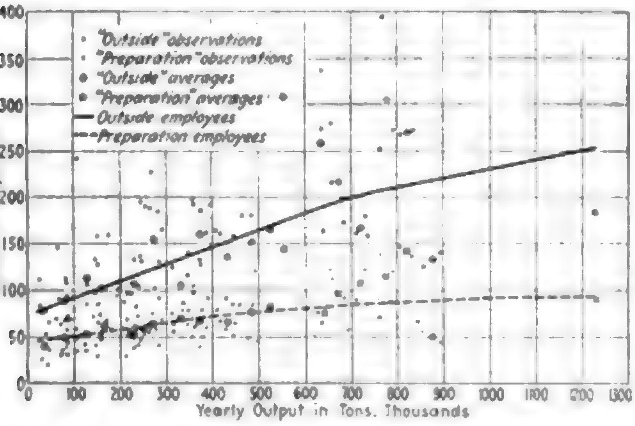


FIG. 4b. RELATION OF OUTSIDE AND PREPARATION EMPLOYEES TO OUTPUT

In a preparator that handles 100,000 tons yearly fifty-two men are required. One which prepares ten times as much will require only ninety men, which fact shows how much more efficient is the large operator than one that is smaller.

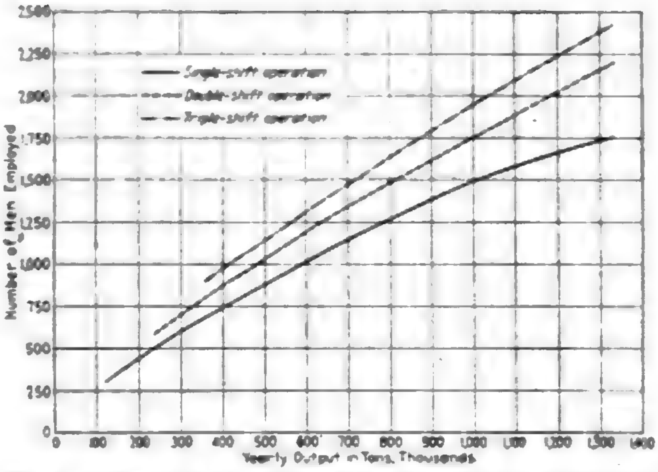


FIG. 5. RELATION OF TOTAL MEN NEEDED FOR MULTIPLE-SHIFT OPERATION TO YEARLY OUTPUT

The curve for triple shifting is made by finding the number of men in a plant of one-third the capacity and multiplying that number by three. The curve for double shifting is made by finding the number of men in a plant of one-half the capacity and multiplying that number by two. In view of the inherent inefficiency of men on a triple shift and of the difficulty in making repairs the assumptions made are not quite true and if corrected the number of men in the double and triple shifts would be increased.

For this reason were the output of the mine put back to 1,000,000 tons, the preparator would now size and clean it for market with less than ninety-three men. Nevertheless, using this instance on the face as an example, 168 men would be required if the preparator were run on a three-shift system and only ninety-three if run only one shift. This shows that the conversion of a preparator of this large size from one operating on a single shift would require the employment of seventy-five additional men.

Consider the assumption that the preparator is to be built and the size can be regulated to suit the three-shift method of operation, we can assume that it will be as economical as a plant to prepare and size an output one-third as great on the one-shift basis. With this in view refer to Fig. 1b, where it is shown that two men are required in the preparator for each 10,000 tons per year of preparator output where 300,000 tons are sized and cleaned per annum. Thus sixty men would be employed on each eight-hour shift, and if the plant were run three shifts in every twenty-four it would be necessary to employ 180 men. This would give an output of 900,000 tons per annum.

Fig. 1b also shows that a tonnage of that size could be cleaned and sized by a force averaging 0.88 of a man per 10,000 tons per annum in a preparator of a size having sufficient capacity to clean and size the coal in eight hours. Such a preparator would require therefore seventy-nine men. Thus a big preparator working eight hours would not require as many men by 101 as a small preparator attaining the same capacity working three shifts.

From Fig. 2b it is possible to deduce that 170 men would be needed for three-shift operation as against ninety for a plant so adequate that it could prepare the coal in an eight-hour day. The curves in Fig. 3b show that whereas 174 men would be required for three-shift operation eighty-eight men would suffice with the larger plant. The co-ordinates of the curves in Fig. 4b show that 174 men would be required for the small plant working twenty-four hours and eighty-seven men for the large plant operating but eight hours. Averaging all the results, the conclusion is arrived at that whereas eighty-six men would be sufficient to work a single-shift preparator producing 900,000 tons per annum, 175 men would be needed to effect the same result in one working continuously. Thus the larger preparator reduces the number of men employed by eighty-nine.

Having seen from the curves the effect of three-shift output of the preparator let these be compared with the actual force accounts of four anthracite preparators which are shown in Table II.

It has already been seen that where only one foreman is employed on single-shift operation there is no way in which the trebling of this expense can be avoided when three-shift operation is introduced, except indeed by an increase in tonnage. On every shift there must be one foreman. The same is true of the ticket taker. The number of dumpers also would be multiplied by three. The number of platemen or tablemen probably could be decreased per shift but not in proportion to the number of shifts. It would take at least twice as many for three shifts as for one. The same may be said of the pickers or slatemen.

TABLE II.—OUTSIDE FORCE AT FOUR ANTHRACITE COLLIERIES

	Mine No. 1	Mine No. 2	Mine No. 3	Mine No. 4
Transportation				
Stationary-hoist engineers	9	9	10	13
Locomotive engineers & helpers	6	4	4	4
Headmen, footmen and plane tenders	5	6	9	11
Drivers, runners and spraggers	5	1	4	5
Car oilers	1	..	1	2
Track repairmen	2	3	1	6
	28	23	29	41
Preparation				
Breaker bosses	1	1	1	3
Ticket takers	1	1	1	..
Dumpers	1	1	1	2
Platemen and tablemen	9	1	11	6
Pickers and slatemen	5	8	6	28
Jig and spiral attendants	9	7	6	3
Machinery attendants	2	..	..	6
Oilers	1	1	1	1
Ropemen	..	..	..	..
Breaker cleaners	1	1	2	..
Engineers	1	..	1	1
Breaker pumpman	1	..	..	..
Miscellaneous	1	1	2	7
Box-car loaders	..	..	1	..
Coal-car loaders	1	4	3	7
Coal runners	5	1	3	..
Car cleaners and patchers	..	1	1	..
	39	28	40	64
Distribution of Refuse				
Locomotive engrs. and helpers	..		..	2
Machine attendants	2	1	1	..
Laborers	6	3	..	3
Pulverizer and borehole attendants	..	..	..	1
	8	4	1	6
Repairs and Maintenance				
Blacksmiths	5	2	4	3
Carpenters	15	4	4	9
Mine-car repairmen	..	6	4	..
Machinists	2	2	1	2
Masons	1	..	1	..
Electricians	..	1	..	..
Machine attendants	..	1	1	..
House repair men	..	1	1	..
Laborers	..	..	.	6
	23	17	16	20
	Mine No. 1	Mine No. 2	Mine No. 3	Mine No. 4
General				
Watchmen	2	2	2	3
Court house (coal inspection)	..	1	1	2
Stablemen	1	1	1	3
Teamsters	1	1	2	2
Fan engineers	..	1	1	4
Fresh-water supply	2	..	..	..
Laborers	10	4	10	..
Propmen	6	2	3	8
Crane engineer	..	..	..	1
	22	12	20	23
Steam				
Firemen	6	6	13	6
Fuelmen	1	1	1	2
Ashmen	2	1	..	5
Boiler repairman	1	..	..	..
Watertender	..	1	..	..
	10	9	14	13
Supervision				
Foremen and assistants	1	1	1	2
Clerks	3	3	3	4
Messengers	1	.	1	.
	5	4	5	6
Totals	135	97	125	173

The number of spiral, jig and machinery attendants on any shift probably could not be reduced even though the output per shift were cut in three. The number of all the other employees probably would have to be trebled, with the exception of the car loaders and runners, the number of whom would increase by only about 100 per cent. Taking these figures and allowing for an equal number of men on each shift for each operation and making due allowance in some cases for abnormal conditions, it is found that for the same output in 24 hours by using the three-shift plan, Mine No. 1 would need 141 per cent more men for preparation, Mine No. 2 would use 147 per cent more men, Mine No. 3, 120 per cent more and Mine No. 4, 119 per cent more. These figures may be compared with the increase from a minimum of 89 per cent to a minimum of 127 per cent in the number of men employed in the preparator as shown by calculations made from the curves.

SMALL PREPARATOR EMPLOYS MANY MEN PER TON

Using the information afforded by the curves and considering all the outside forces at the collieries except in the preparation plant, it is found from Fig. 1b that at a colliery having an output of 900,000 tons on one shift, or 300,000 tons on each of three shifts, 351 men would be needed for the three-shift operation and 180 for the single-shift operation. From Fig. 2b it is seen that the output per outside man in the three-shift operation is 2,720 tons whereas for the single-shift operation it is 5,200 tons. Thus 331 men will be required for three-shift operation and 173 for single-shift. From Fig. 3b, assuming 280 starts per year, it is seen that 360 men are needed for the three-shift and only 206 for the single-shift. Lastly from Fig. 4b, 330 men are needed for the three-shift and 212 for the one-shift operation. Averaging these figures it is found that 343 men are required for a three-shift operation and only 193 men for a single-shift operation with the same output, or a saving for the single-shift of 150 men.

Totaling the previous results which have been obtained from the curves it is found that with three-shift operation 1,794 men will be required, whereas with the single-shift operation which now obtains only 1,387 men are needed. Thus the present method saves the employment of 407 men. Fig. 5 contains summation curves showing the average number of men employed and also the number that would be required for two- and three-shift operation of a colliery of the same size but with the output divided into two or three, as the case may be, depending on the number of shifts.

This study of the curves of the average number of men employed in anthracite collieries shows that more men are required to produce the same tonnage in three shifts than would be needed in one shift. In the example taken it shows that the force of men required would have to be increased 29.4 per cent if the mine were to be placed upon the three-shift basis without increasing the output.

These figures, of course, are general and only approximations, but they are believed to err on the side of conservatism. Though it is true that some classes of employees, as pumpmen, would not be affected by the number of shifts worked, these variations are amply compensated for in the conservative allowances for other classes of employees.

Contracted Landing Area at Head of Plane Makes Difficult Mine-Track Problem

By William Reid
Clarksburg, W. Va.

THE ACCOMPANYING illustration shows the solution of a complicated track problem at the mine of the Fort Clark Coal Co., Wilsonburg, W. Va., the general offices of which are at Clarksburg, in the same state. This mine, opened a little more than three years ago, is reached by an incline about 600 ft. long from tipple to knuckle and lying on approximately a 20-deg. grade.

At first only two openings were made, these having a 50-ft. pillar between them. They are the two entries to No. 1 mine, and are shown on the exteme right and extreme left of the illustration respectively. Owing to the abruptness of the hillside little outside standing room for cars was obtained. At the top of the incline the tracks extend parallel to each other for a distance of 24 ft., there being a clearance of 24 in. between them. They then diverge over a space of 48 x 50 ft., to the portals of the two openings mentioned.

The loads have a grade of 1½ per cent in their favor and the inclination favoring the empties is 2 per cent. This favorable arrangement is obtained by lowering loaded cars invariably on one side of the incline and raising the empties on the other. By this means the knuckle of the empty track can be raised to a sufficient height to afford the empties a favoring grade toward the mine.

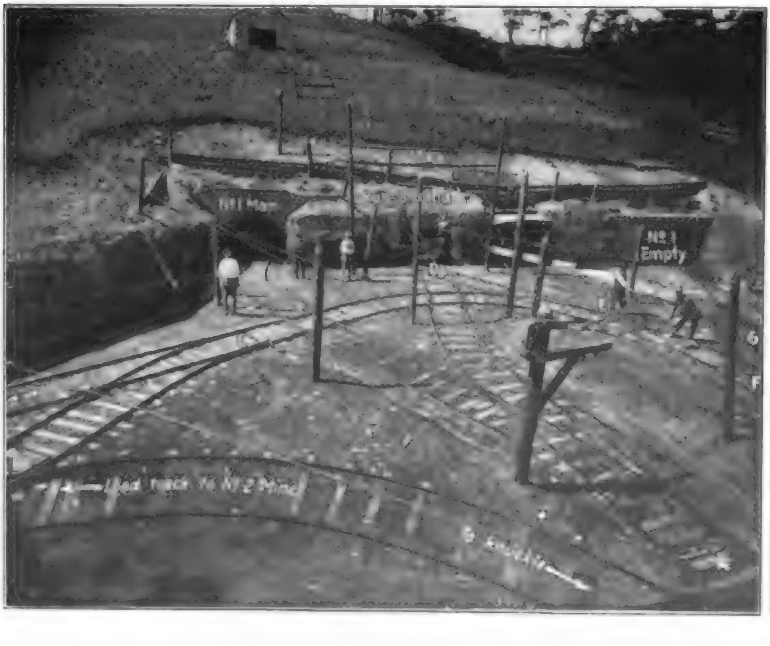
In order to increase development another opening was made around the hillside to the left of, and beyond, the illustration. The problem of proper track arrangement arose with the purchase of a haulage locomotive. This problem consisted largely in the transference of this machine from one mine to the other while still keeping the trolley pole on the wide side of the heading or on the brake side of the car. In laying out the mine track it had been kept as close as possible to the side of the heading opposite the brake mechanism on the cars, so as to insure that the trip rider should have ample room to pass along the trip.

The problem presented could have been solved easily by placing trolley poles upon both sides of the locomotive, but it was not thought advisable to adopt that plan. To meet the difficulty another opening was made between the loaded and empty tracks of No. 1 mine and called the "run-around." The complete layout by which the problem was met comprised six switches, six tracks, two crossings and a semicircular track, all placed on an area measuring 48 x 50 ft. The illustration shows how the tracks were laid. The layout has given full satisfaction.

The layout as here shown was designed by myself. All frog and switch dimensions were given to the Helmick Foundry & Machine Co., of Fairmont, W. Va., which firm furnished the frogs, crossings and switch points, the latter provided with spring attachments on the bars.

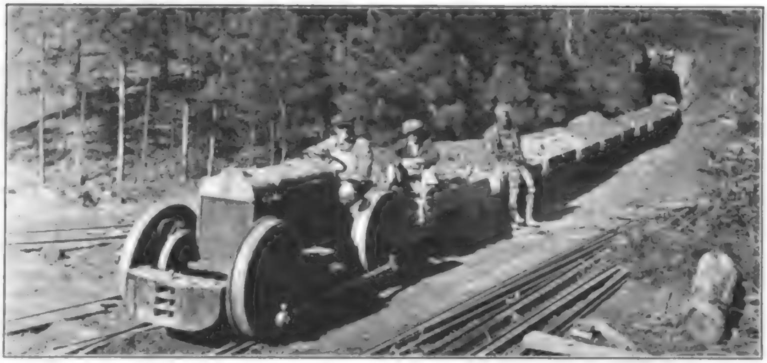
Now let us follow the movement of the locomotive in transferring from one mine to the other. Suppose that the motor comes with a loaded trip from mine No. 2. It cuts loose from the trip at the switch *B*, passes through *C* and around the curve to the right to *F*, where it gets behind the empty trip. As an alternate procedure the locomotive may pass through switches *E* and *D* in the run-around and get ahead of the trip of empties. The run-around intersects the empty sidetrack or opening underground.

Similarly if the locomotive comes out of mine No. 1 with a trip of loads, it cuts loose at *A*, leaving clearance at the frog. It then passes up the run-around



Trackwork at Wilsonburg Mine

With only 48 ft. x 50 ft. in which to place switches, arrangements were made at the head of the plane for the many switches by which to handle cars to two mines. The knuckle of the plane is only 24 ft. from the points of switch *A*, which are at the extreme lower right-hand corner of the illustration. Standing trip room for No. 1 mine is provided in the drifts of that operation. A run-around between the drifts enables the locomotive to get behind the empty trip.



Tractor Locomotive

Uses about one gallon of gasoline and one-twentieth of a quart of lubricating oil for every 20 tons of coal or fireclay hauled a mile. The distance traversed each way is 4,560 ft., and the locomotive makes ten or eleven round trips per day.

through switch *D*, comes back to *E*, then over the curve to the left and attaches to the empty trip beyond switch *C* on the empty track to No. 2 mine.

Owing to the position of the camera when the picture was taken the width of the space occupied by the tracks is distorted and exaggerated. Those who view the actual installation, however, consider it quite a feat in track laying.

Adapting the Tractor to Mine Haulage

GASOLINE-LOCOMOTIVE development for mine use hitherto has followed more or less closely the progress made by the automobile builder. During recent years, however, another form of self-propelled vehicle closely paralleling the locomotive in function has made its appearance. This is the farm tractor. This machine has been much more rapidly developed than the automobile, for the builders could draw readily on the experience of the makers of pleasure vehicles.

During the past decade the farm tractor has thoroughly demonstrated its usefulness and reliability. Today these machines are used by the thousands throughout the rural districts of both this and foreign lands. It is little wonder, therefore, that an enterprising builder of mine equipment should adapt one of the best known of these machines to mine haulage.

Breese Adamson, of the Adamson Motor Co., Birmingham, Ala., has built an attachment for the Fordson tractor that adapts it to use upon the rails of a mine-haulage road. This attachment, for which a patent application has been entered, follows as far as possible the same general construction as that adopted in the tractor itself. The wheels are, of course, replaced with drivers, these being connected by means of side rods, so as to render the entire weight of the machine effective for pulling or pushing a load. A suitable frame and bumpers also are supplied, the point of pull being in the same relative position to the tractor as before, so that the effectiveness of the machine is in no way impaired.

As is well known, the Fordson tractor is built with "three speeds forward and one reverse." This is retained in the Adamson locomotive. In order to keep the machine constantly in front of its load, both when going into and coming out of the mine if room for a Y is not available, simple turntables have been developed. These may be installed almost anywhere, and as they rest on ball bearings they reverse the locomotive with ease.

It is asserted by the builder that conversion from tractor to locomotive or back again can be made by an ordinary mechanic in three hours. Aside from the sanding device only thirty-four bolts are used in the attachment.

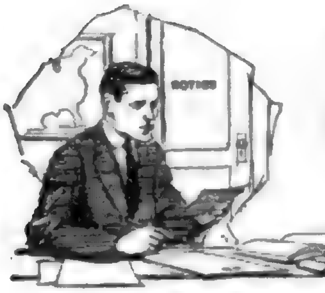
The accompanying illustration shows one of these locomotives at work at the mine of the Lehigh Coal Co., Lehigh, Ala. At this operation the length of the haul is 4,560 ft., and the machine makes ten to eleven round trips per day with ease. The average gross weight hauled per trip is 30 tons and the maximum grade is 1½ per cent. The entire journey, after the trip of cars has been gotten under way, is made in high gear. This machine moved 1,323 tons of coal and fireclay, traveling a total distance of 53¾ miles, empty cars being returned over the same distance, with a total fuel consumption of 60 gallons of gasoline Three quarts of lubricating oil also were used, the consumption of transmission oil being negligible.

Ill-Centered Wood Rollers Ruin Bearings And Frequently Fail to Roll

IT IS difficult to bore a straight center hole through a wood roller because the grain causes the drill to swerve. If such a roller be sawn in two along a diameter the hole will be found to be crooked with an offset in the middle, for the hole will not be continuous but drilled from each end. Gudgeons, or journals, can be driven into such holes only with great difficulty. Often when the holes are much out of line the cost of inserting the gudgeons add materially to the original cost. Nor is that all when the roller is assembled in the bearings it is not concentric with the gudgeon. If the roller revolves this ruins the bearings. If it does not, the roller is of no service; it soon grooves and wears out, being sawn through to the gudgeon by the action of the rope.

The Colonial Supply Co., of Pittsburgh, it is said, has a specially designed machine that will bore the gudgeon hole true within a thirty-second of an inch, giving the roller greatly increased life. The rollers are delivered either without gudgeons or with new, and consequently perfectly true, journals fitted onto the rollers before they are sent out.

Another important matter is to get the right wood for the manufacture of rollers. First grade black-gum wood is to be preferred. It should not be Tupelo wood, which grows in marshes, for that material is not hard enough or sufficiently wear resisting. Sweet, or red, gum is even less satisfactory than Tupelo.



Problems of Operating Men

Edited by James T. Beard

Ventilation of Gassy and Dusty Mines

Ventilation an Important Factor in Operation of Mines—What Constitutes Good Ventilation—Requirements of the State Mining Laws—Booster Fans Condemned—Lessons Taught by Experience

PERMIT me to offer a few further thoughts on the subject of good ventilation. Mine Foreman, writing in *Coal Age*, July 7, p. 18, expresses a real fact when he says, "Ventilation is the most important question in the operation of a coal mine."

Without ventilation of some nature, all underground coal mining would soon cease. The sanitary condition of mines depends, in a large measure, on the efficiency of the ventilating current. Men and animals do more and better work in a good supply of fresh air than is possible in poor air.

EFFICIENT MINE VENTILATION A GOOD INVESTMENT

Good ventilation is a good investment in the operation of a coal mine. It is astonishing how little attention and thought is given this important question by many mine officials, especially in the smaller mines.

During the four years that I was mine inspector in the western part of this state, I had an average of seventy-five mines of various classification in my charge. Trouble in regard to ventilation was confined mostly to the small mines. Many of these mines were in charge of foremen who seemed to know or care but little about the ventilation of the workings.

FUNDAMENTAL PRINCIPLE

Henry Bock, in his letter, *Coal Age*, Apr. 28, p. 756, is also right when he expresses the thought that the fundamental principle of ventilation is to conduct the air current to the faces of the working places in such quantities that it will dilute and carry away all poisonous gases and supply the miner, in every section of the mine, with wholesome air in which to work.

It is the equal distribution of fresh air throughout the entire mine, making as nearly as possible, a uniform temperature in every section, that constitutes good ventilation. A large volume of air entering a mine does not always indicate that the mine is well ventilated. A sufficient volume of air may be entering the mine, but the quantity reaching the working faces may yet be inadequate owing to leaky stoppings, doors and air bridges.

In all class-A mines in this state, the mining laws provide that the minimum amount of fresh air supplied to each person and animal employed in the mine shall be 150 cu.ft. per min. for each person and 600 cu.ft. per min. for each animal.

In my opinion, this law cannot be so construed as to mean that its requirements are being met when the specified amount of fresh air, for each person and animal, is being forced into the mine. The law evidently means that the specified amount of air for each person and animal is to be delivered to them fresh in the remote sections of the mine.

Neither will the requirements of the law be met when a miner working in an extreme heading is supplied with 150 cu.ft. of air per minute if that air has been previously used to the limit by men and animals, and is no longer fresh from the outside. But, as Mr. Bock states, "To do this requires skill in the arrangement of the ventilating system throughout the mine."

BOOSTER FAN TO BE USED ONLY IN EXCEPTIONAL CASES

In extensive mines where the air has to be delivered from two to two-and-one-half miles distant and must then be conducted through many working places, as required by law, I think all will agree, it becomes a troublesome problem as well as an expensive one. In such cases, in order to avoid expense, I greatly fear the booster fan is too often resorted to as a makeshift.

There may be instances where the temporary use of a booster fan is admissible; but when that device is made a permanent factor in the ventilation of a gassy mine I join with W. H. Luxton in opposing its use. There are too many "Ifs" involved in the use of a booster fan, in the ventilation of deep and extensive gassy mines.

I frankly admit that it will often be less expensive to install a booster fan, in extended workings, than it would be to make the necessary adjustments and improvements to deliver the required air from the outside. But just here is where the danger lies of its use becoming general in these mines.

From the standpoint of economics, the booster fan will continue to be installed, with the result that the airways, from the booster back to the outside will receive little if any attention and become more and more obstructed. The little booster will accomplish no more than to fan the same air round and round, until the air becomes charged with gas and an explosion takes place and a number of lives are snuffed out.

When that happens, believe me, the rescuing parties will have some job before them exploring such a mine. In the first place, all mines should be opened up from the start and developed with a view of giving and maintaining a good ventilation throughout the operation when it becomes more extensive.

NEED OF A VENTILATING BOSS

In my opinion, in order to insure better ventilation and the safety of life, in all large gassy mines, there should be a ventilating boss, who would have charge of the ventilation and the oversight and construction of all bratticework, doors, airways and the sprinkling system where one is required. My observation shows that, in such large gassy mines, the foreman has enough to do in looking after the miners in their working places, the haulage system, the output and general conditions relating to the operation of the mine.

Referring to the letter of Oscar H. Jones, Sept. 29, p. 495, permit me to say, it is not because of a supposed incapability of the mine foreman to arrange the ventilating system of the mine in a way to get the best possible results, that I advocate the employment of a ventilating boss in a large gassy mine. My purpose is to relieve the foreman who has his hands full of other things, and to insure a more efficient ventilation and a better protection of life and property.

MANY CAPABLE MINERS

Experience has taught me that mine foremen are not the only men, in and around coal mines, who are capable of efficiently ventilating the mines. I know uncertified miners whom I would much rather risk with the ventilation of a mine than some foremen of my acquaintance.

It is true that the mining laws of this state make it the duty of every mine foreman to look after the ventilation, besides compelling him to shoulder numerous other responsibilities resting upon him. But, I am fully convinced that were the foremen in large gassy mines relieved of the charge and upkeep of the ventilation and this duty placed in the hands of a capable man better results would follow.

In conclusion, then, let me say that I have filled the position of ventilating boss in two of the most dangerous mines in this state. These mines were both gassy and dusty. Moreover, the formation was extremely irregular, making the mines difficult to ventilate properly. In the Nelson mine I served as ventilating boss for a term of six years and, likewise, two years in the Prospect mine.

EXPERIENCE SHOWS DANGER IN NEGLECTING VENTILATION

My experience in those two mines taught me thoroughly the danger of neglected and inefficient ventilation in gassy mines. On Dec. 20, 1895, an explosion occurred in the Nelson mine, killing 28 persons. I assisted in taking out the dead and cleaning up the mine. It was a gas explosion augmented by dust. Both the ventilation and the dust conditions had been neglected in that mine. Later, these conditions were somewhat improved and the mine was then operated with safety lamps.

On Mar. 30, 1902, another explosion occurred in the same mine, killing 16 persons. This time it was a dust explosion that was caused by a blownout shot. Again I assisted in taking out the dead and cleaning up the mine. When the place was ready to resume operations, I was made ventilating boss and held that position till the mine was finally abandoned May 16, 1908.

With the 23 years' experience gained in those gassy and dusty mines, I learned to know what an inefficient ventilation will do in such mines, and what will sooner or later result from the lack of an efficient sprinkling system in a dusty mine. As a means of safety, in the one case, the air must be conducted to the working places in sufficient quantity to render harmless all gases generated; and, in the other case, the dust must be removed or humidified until it also is rendered harmless.

Dayton, Tenn. JOHN ROSE,
Former District Mine Inspector.

Fan Ventilating Two Seams

Failure ascribed to wind pressure—Testing for motive columns in shaft—Ascensional ventilation in deep-lying seams.

REFERRING to the failure to ventilate both seams by a single fan, as explained by "Master Mechanic," in *Coal Age*, Oct. 6, p. 542, allow me to suggest that the trouble in this case, may be due to a high wind pressure acting against the fan.

Under such atmospheric conditions, it often happens that the action of a ventilating fan is partially neutralized by the opposing elements. Perhaps, the fan chimney, in this instance, is exposed to a strong wind pressure that tends to counteract the pressure due to the fan and the ventilation in the mine is retarded as a result.

The idea has been suggested that a motive column may be formed in the shaft, which opposes the general circulation that the fan would establish in the mine. To prove or disprove this effect, I would make tests to ascertain the amount and direction of the air flowing when the fan is stopped. These tests should take account of temperature of the air, barometric conditions and effect of wind pressure.

The second shaft is said to be 5 x 10 ft., in section, and 260 ft. deep; but it is not stated whether the top of the shaft is above or below the location of the fan.

Assuming that the fan is exhausting and the new shaft is a downcast for the two seams, I can see no reason why this fan should fail to ventilate both seams, if it is capable of producing 150,000 cu.ft. of air per minute as stated by the correspondent.

ASCENSIONAL VENTILATION EASY

An Illinois mine foreman, whose letter appears in the issue of Nov. 24, p. 848, has referred to old-country practice where a single fan ventilates eight or ten seams, pitching as high as 80 deg., and where it is probable the ventilation is wholly ascensional. There is of course no trouble to ventilate any number of seams, in such a case, provided the fan has the required capacity. The main air current is blown to the full depth of the shaft, from which point it will naturally distribute itself, in as many splits as are needed to ventilate the several seams.

In all such cases, the main return air-course is well above the workings, to comply with the state laws of Belgium and France, which specify that the arrangement must be such that the return air cannot re-enter the mine, or descend to a lower level.

Stated briefly, I would consider this present case a question of two splits, one being much longer than the other. Then, by placing a regulator in the return of the shorter split, it should be possible to regulate the air current as desired.

The lower seam being the longer of the two splits, the intake air should be forced down to that level. The regulator in the upper seam can then be so adjusted as to permit only the proper amount of air to pass in that split. Such an arrangement should present no difficulties in ventilating both seams.

Peru, Ill. GASTON F. LIBIEZ.

Loss of Zinc Chloride in Treating Wood

Large loss of the impregnated solution shown by experiments reported in a French publication—Authority quoted in translation.

KINDLY permit me to offer the following, in reply to the letter of Frank G. Breyer, which appeared in *Coal Age*, Dec. 22, p. 1015, regarding the loss of zinc chloride in the preservation of wood.

It is not my desire to enter into any discussion of the matter or to start a controversy. I only wish to give the authority for the statements made in my previous article, to which Mr. Breyer takes exception.

The information relating to the loss of zinc chloride when used as a wood preservative was taken from a French monograph on that subject, which I will translate verbally, as my authority for the statements made. The author states as follows (translated from the French):

> In 1854, Bethell began to inject ties required for the tracks of the Compagnie du Midi; but this was given up after two years, on account of the unsatisfactory results obtained by the process. It was established that almost the entire quantity of chloride of zinc is carried away by rain water.
>
> According to experiments made along these lines, ties of pine wood impregnated with chloride of zinc, show, three years after impregnation, a loss of from 80 to 85 per cent of the original quantity. In ties of beech wood, this loss increased to from 90 to 95 per cent.
>
> Chloride of zinc is an acid salt and, in the combination it forms with albumen, one asks oneself, What becomes of the chlorine? According to the opinion of Hutin and Boutigny, the chlorine set free alters the vegetable fiber.

I claim no personal knowledge about this, but have accepted these statements as essentially correct, because they coincide with what men of wide experience in wood preservation have told me. F. G. ZINSSER.

Hastings-on-Hudson, N. Y.

Essentials in Ventilation

Air-tight stoppings necessary to maintain good circulation in a mine — Trapdoors an unnecessary evil — Legislation needed to make certain specific requirements in mining.

BEING deeply interested in the matter of good ventilation in mines, I have read with great interest the several letters relating to that subject. All practical miners agree that the ventilation of a mine is the most essential factor in its operation.

In my experience, there are a few chief points that must be considered. First, the operator must install a fan capable of producing the necessary quantity of air. Second, it is necessary to build substantial air-tight stoppings, in order to maintain a good circulation and carry the air to the working face, where it is needed to make the mine healthy and safe for work.

TRAP NEEDED WHERE DITCH IS CARRIED UNDER DOOR

Speaking of air-tight stoppings and doors, one important point that is often overlooked is the carrying of a drainage ditch under a door. It generally happens that the ditch is left open, with the result that there is a large leakage of air at that point.

When a ditch is to be carried through a door, a water-trap should be so arranged as to prevent the leakage of air. The seal should be sufficiently strong to resist the air pressure; or, otherwise, air will force its way through the water.

From time to time, writers in *Coal Age* have condemned the use of trapdoors in mines. I agree with them fully. Trapdoors, at the best, are an evil to be avoided. Not only are they a menace to the safety of drivers hauling the coal, but they impair the ventilation of the mine by leaking air or being carelessly set open and short-circuiting the current.

Some correspondents have referred to the need of employing a ventilating engineer; but I agree with Oscar H. Jones, *Coal Age*, Sept. 29, p. 495, who states, "The foreman should have the full control of everything pertaining to the ventilation of the mine."

With Mr. Jones, I consider a foreman who is not capable of ventilating a mine properly is unfit for the position he holds. There are, however, things that are more important and essential than the employment of a ventilating engineer, in the securing of good ventilation in a mine.

STATE MINING LAWS SHOULD MAKE MORE SPECIFIC REQUIREMENTS

To my mind, our mining laws are not specific enough in requiring certain of these essential details, which are left to the judgment of the foreman in charge. I would even say that trapdoors should be prohibited in mines, except small doors, built in overcasts and stoppings where necessary, and made of incombustible material.

Again, the law should compel every operator to install a ventilating fan suitably adapted to the size of the mine and the daily tonnage expected. One essential point is the requirement, by law, that the velocity of the air passing through the last crosscut of a pair of entries shall not be less than 150 ft. per min., and all crosscuts to have an area not less than 50 sq.ft.

If our mining laws contained a few requirements such as these there would be less left to the judgment of the mine foreman, whose duty would then be to see that the law was fulfilled.

Other essential requirements in ventilation are, that all abandoned workings shall be either sealed off with airtight stoppings, or ventilated in a manner to prevent the accumulation of gas in such places. Also, it should be required by law that the circulation shall be so conducted that seventy-five per cent of the air entering the mine will reach the working faces.

Finally, failure to comply with these requirements of the law should be punished by a suitable fine or the withdrawal of the foreman's certificate. In closing, let me say that the desire of many operators for tonnage compels the foreman to adopt methods that are not justified by the ventilating facilities at his command, as he well knows. This is a point in which the law should provide some protection for the foreman.

Aultman, Pa. WILLIAM J. WALKER.

Inquiries Of General Interest

Mixing Salt With the Stemming, in Blasting

Salt Absorbs Moisture—Mixed with Stemming and Thrown Out by the Blast It Would Tend to Keep the Dust Damp—Extinctive Effect of Salt Would Act to Decrease Flame of Shot in Blasting Coal

TALKING, recently, with a superintendent of an Oklahoma mine, I learned that common salt had been used in tamping the holes, in blasting coal in some of the mines. He stated that their coal made much fine dust when blasted, and the suggestion was made that the well-known property of salt to absorb moisture from the air should make it an effective agent for keeping the dust damp, if the salt was mixed with the stemming when tamping the hole.

It was argued that the salt thrown out with the dust, by the force of the blast, would be distributed where it was most needed. The superintendent stated that they had acted on this suggestion and he thought that some good had resulted, though it was difficult to state to what degree the practice was effective in allaying the dust danger in blasting coal.

My understanding is that the absorption of moisture by common salt is largely due to the impurities, such as calcium and magnesium chloride, contained in the salt. There are numerous deliquescent substances that possess the property of abstracting moisture from the air; namely, calcium chloride, potassium carbonate, zinc chloride, sodium hydroxide and potassium hydroxide.

The question I would like to ask is, Has *Coal Age* or any of its readers known of these substances being used for the purpose mentioned; and, if so, when and where was the experiment tried and with what success?

Chicago, Ill. ENGINEER.

This is, indeed, an interesting inquiry and we hope it will call forth further information in reference to the alleged practice of salting the stemming of a shot, in blasting coal in dusty mines. The idea is certainly suggestive and good results might reasonably be expected in the efforts being made to allay the dust danger.

In this connection, however, another thought suggests itself, relative to a further benefit that might accrue from the practice of salting the stemming of a shot when blasting coal, in a dusty mine or in a mine generating gas.

As is well known, salt has an extinctive effect on flame. Salt has often been thrown on an incipient fire with good effect. If this is true, why should not the mixing of fine salt with the material used in tamping a shot exert an extinctive effect on the flame of the burning powder that is projected from the hole when the blast is fired?

This is a question worthy of careful consideration and may well be made a study for investigation by the Federal Bureau of Mines and Experiment Stations in mining districts. Many readers of *Coal Age* may be able to throw light on this matter and offer some practical and helpful suggestions. Let us hear from them.

Two Values for Calorie

French unit, calorie, has two values—The large calorie, kilogram-calorie, most commonly used—The small calorie, gram-calorie, mostly used by chemists.

READING from "Mine Gases and Ventilation" (page 52), the French thermal unit or calorie is defined as follows: "This is the quantity of heat required to raise the temperature of one kilogram of pure distilled water, at maximum density, one degree of the Centigrade scale."

I have been studying Millikan and Gale's First Course in Physics, and find the following definition for the French unit of heat: "A unit of heat is defined as the quantity or amount of heat that is required to raise the temperature of one gram of water through one degree, Centigrade. May I ask which of these values is correct?

Cambria Co., Pa. STUDENT.

Replying to this inquiry, it should be stated that the value of the French heat unit or calorie is commonly expressed in the definition first given above. It is the quantity of heat that will raise the temperature of one kilogram of pure distilled water, at maximum density, one degree of the Centigrade scale.

Unless otherwise stated, this value is always understood to be that of the calorie. For the sake of convenience, however, chemists have used a value based on a gram of distilled water at maximum density, instead of a kilogram. By way of distinction, this is sometimes called the "gram-calorie," or "small calorie"; while the value in common use is described as the "kilogram-calorie," or "large calorie."

These two values give rise to no confusion, as their use is only relative, the same unit being employed to measure the amount of the substance under investigation. The fact that chemists are dealing with small quantities of substances, measured in grams, explains their use of the gram-calorie, or small calorie. On the other hand, in more general practice the weight of substances under investigation is generally given in kilograms, making it more convenient to use the kilogram-calorie or large calorie, which is the common unit employed in the French system. When the gram or small calorie is used it should be so stated.

Examination Questions Answered

Mine Foremen's and Firebosses' Examination Charleston, W. Va.—1921

QUESTION—*State the chief causes of accidents in this state and the methods you would adopt to prevent same.*

ANSWER—The chief causes of mine accidents are falls of coal and roof at the working face and on roads and traveling ways; careless handling of powder in the preparation of charges for blasting; lack of judgment in placing shots; failure to properly tamp the charge; returning to the face to ascertain the cause of a missfire; firing two or more shots, at the same time, in a close place, or failure to examine for gas before firing; lack of proper safety appliances, refuge holes and separate traveling ways; poor installation of electric wires, failure to safeguard the same and to use proper precaution to avoid contact with live wires; lack of strict regulations to insure the safety of workers, and suitable punishment for any violation of these rules.

The most effective means of preventing accidents from these causes is to make and enforce strict regulations and maintain discipline in the mine. Provide necessary safety appliances and see that all needed supplies of timber are promptly delivered and kept on hand in every working place. Use only permissible powders and employ competent shotfirers to examine, charge and fire all shots that in their judgment are safe. Where safety lamps are required, no open lights should be permitted in the mine. All safety lamps should be properly cleaned, filled and delivered to the men, at the beginning of each shift. Drivers, timbermen and other shifthands or daymen should be equipped with electric cap lamps.

QUESTION—*What are the necessary supplies that should always be on hand, at the mine, for the safe working of the same; and what is your duty if the operating company fails to keep these supplies on hand?*

ANSWER—There should be kept on hand ample supplies of props, cap-pieces and other needed timber, cut to the proper dimensions and ready for use; also, rails, tracking, brattice boards, canvas, nails and tools of all kinds and such extra parts of machines, car-axles and wheels as are liable to be needed to replace those worn or broken. Every mine should be equipped with a full supply of first-aid materials, such as splints, bandages, stretchers, blankets and waterproof coverings.

In case these supplies are not provided and kept on hand by the company it is the duty of the mine foreman to notify the company, in writing, stating what supplies are needed, in accordance with Sec. 39 of the West Virginia Mining Law. A company failing to supply what is needed in the mine for its safe operation, is liable to a fine of from $50 to $200, or imprisonment in the County Jail from thirty to ninety days, as the court may decide.

QUESTION—*(a) Do you approve of shooting coal from the solid? (b) State under what conditions you would permit solid shooting to be done.*

ANSWER—(a) Solid shooting is not advisable in the mining of bituminous coal and should only be permitted in the mine, under particular conditions that would make it safe.

(b) The mining law (Sec. 36) authorizes the district mine inspector to prescribe the condition under which solid shooting may be done. These conditions must be determined by the judgment of the mine inspector, after a careful study of the situation. Permission allowing solid shooting, in any particular case, must be given, in writing, by the mine inspector to the foreman in charge.

QUESTION—*What is the limit to the quantity of explosives to be taken inside of the mine, by any one person; and what are the requirements of the law regarding the container for carrying such explosives?*

ANSWER—The law (Sec. 75) forbids any miner or employee to take into the mine a larger quantity of powder, or other explosive, than he may reasonably be expected to use in that shift, such explosives must be carried in a metallic cannister or fiber receptacle, having a capacity not to exceed 5 lb., and carefully closed with an approved top or cover.

QUESTION—*Give reasons why different methods of mining are used, and why one method will not answer for all mines.*

ANSWER—Variations in the depth below the surface, the inclination and thickness of the seam, the hardness of the coal and the nature of the roof and floor make it necessary to employ different methods of mining the coal, choosing the method best adapted to the particular conditions in any given case.

In general, a deep-lying seam, or frail roof and soft bottom will require a less width of opening and larger pillars. While seams of moderate thickness are well adapted to the room-and-pillar system of working, thin coal seams, particularly lying at a considerable depth below the surface, are best mined by the longwall method.

Again, what is known as "bench mining" must often be used in seams of great thickness. The panel system of mining is much used in gassy mines and stope mining must often be employed when the seam is highly inclined. It is obvious from the foregoing that one method of working cannot be used in all mines owing to the varying conditions in those mines.

QUESTION—*If you had a number of men working in a section where fire was discovered in the intake airway, state how you would proceed to rescue the men and protect the lives of all other employees inside.*

ANSWER—This question can only be answered in a general way, without a full knowledge of the situation. A fire in the intake airway leading to a section of the mine where men are working requires prompt action to first notify and withdraw the men, before they are overcome by the smoke and gases produced by the fire. If it is possible to take the men out by any other way, immediate steps should be taken to short-circuit the air, by breaking down a stopping or opening a door inby from the fire. At the same time every effort must be made to get water to the fire, on the intake side. The first consideration always is notifying and withdrawing the men by the safest possible route. Word should also be sent to the men working in other sections of the mine and safety will generally require that they be withdrawn promptly from the mine.

QUESTION—*A workman has ignited a pocket of gas and is severely burned about the face and arms. State how you would rescue him and protect yourself; also, state how you would treat him.*

ANSWER — Remove the victim as quickly as possible to nearby, fresher air, taking care to handle him carefully. Having sent at once for a doctor, carefully loosen the clothing about the chest cutting it from the arms that are burned. As much as possible exclude the air from the burned part and, as quickly as this can be obtained, apply oil or a thin paste of baking soda, flour or starch. Vaseline, olive oil, fresh lard or cream, or an emulsion of boiled oil and lime water are all good. To restore consciousness, in the condition of this patient, the usual methods cannot be wholly employed. Rub the lower limbs upward to assist circulation, and use a fan gently to permit the free access of fresh air, at the same time, holding a sponge or handkerchief moistened with ammonia near the nose, or using smelling salts with caution.

In rescuing the person from under the gas burning in the room, stoop low and move as quietly as possible. Protect the head and shoulders with a coat while so doing.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

MEN are hopeful for 1922 according to the degree in which their optimism, backed by the progress that has been made in economic adjustment, overcomes the disquieting indications in current affairs, according to a review of business conditions issued by the Mechanics & Metals National Bank of the City of New York. "There are those who, placing their faith in a number of specific evidences of improvement which recently have manifested themselves," the review continues, "are distinctly confident of a progressive betterment during the new year. There are others who, reviewing the difficulty of the readjustments of 1921, are inclined to hold their confidence in check until they learn how far the prevailing evidences of improvement will carry. There are still others who, probing the fundamental forces which are responsible for the world's present troubles, are inclined not to be cheerful at all.

"Generally speaking, the spirit of confidence predominates. Recognition that the United States is steadily moving toward economic health underlies much of the hopeful anticipation for the new year, and this is supplemented, in its good effect, by developments of an international nature.

"Looking into the future, it is far from an entirely happy world that is engaging the thoughts and plans of business leaders. Yet of all the signs of the times, perhaps a negative one is the most significant, namely, that it is no longer necessary to outline for thinking people how far economic confusion permeates every phase of modern life, and how difficult and prolonged will be the task of reconstruction.

"Narrowing our views to our immediate local problems, it can fairly be said that in spite of the shrunken export buying and the small purchases from the agricultural sections of the country, the industrial East is maintaining a favorable rate of activity. Prices are not holding firm in every instance, shading having taken place in the hope of inducing purchases. But on the whole, with producers and distributors fairly well liquidated, the situation is all that can be expected."

Steel Plants Speed Up

Steel plant operations are gradually broadening in the Mahoning Valley. The Youngstown Sheet & Tube Co. schedule has been substantially enlarged. Fifty-one of the 113 sheet mills in the Mahoning Valley are under power, as compared with 45 two weeks ago. The A. M. Byers Co., Pittsburgh, is operating its blast furnace at Girard, one skelp mill and 88 puddling furnaces. The Trumbull Steel Co. has increased the number of its active tin mills from 10 to 19. Operations will begin soon at the plant in Canton of the Carnahan Tin Plate & Sheet Co., which has been acquired by the Fallcon Tin Plate Co. of Niles. At its Ohio works the Carnegie Steel Co. is operating five of its six blast furnaces. The Republic Iron & Steel Co. again is operating two merchant bar mills, following a long period of suspension. The Newton Steel Co., which is booked about four weeks ahead, has its 10 hot mills at Newton Falls engaged on sheet stock.

Hundreds of workmen in the Allegheny Valley returned to work Jan. 17, when No. 1 department of the Allegheny Steel Company at Breckenridge resumed operations in full. The men had been idle for more than a year.

The Aetna Standard plant of the United States Steel Corporation at Wheeling, W. Va., has resumed operations in full. Three of the corporation's plants in the Wheeling district are now operating in all departments.

Car Loadings Rebound Sharply

Loading of revenue freight totaled 605,992 cars during the week ended on Jan. 7 compared with 531,034 during the previous week, or an increase of 74,958, according to the American Railway Association. The greatest increase noted over the previous week was in coal, the total being 136,982 cars, or 31,320 more than were loaded during the week ended Dec. 31, but this was 54,251 less than during the corresponding week last year and 72,356 less than the corresponding week in 1920.

Idle freight cars numbered 646,673 on Jan. 8 compared with 618,675 on Jan. 1, or an increase of 27,998.

Reports Building Picking Up

In announcing that they have recently underwritten first mortgage serial bond issues amounting to $12,485,000, S. W. Straus & Co. comment on the building situation in general as follows: "There is a continued improvement to be noted in underlying conditions of the building industry, and it is expected that activities during the ensuing year will be on a very heavy scale. There is a healthy inquiry for capital for building purposes, particularly for residential improvements, and a large proportion of the outflow of capital for the building industry is being absorbed in financing the construction of these types of structures."

Expect More Paper Business

This year will see no startling demand for paper, but a renewal of business can be expected about Feb. 1, says the monthly business review of *The Paper and Pulp Industry*, a bulletin of the American Paper and Pulp Assosciation. "With a total production of paper of about 5,300,000 tons for the year 1921, as compared with 7,334,600 tons in 1920, the paper industry seems to face a certain increase in production during 1922, as compared with the year of depression just closed," says the bulletin. "Production for the coming year seems certain to exceed 6,000,000 tons, even though many branches of the industry will not be able to operate at capacity."

Rail Equipment Orders Plentiful

Railroad equipment orders announced recently indicate that the railroads are planning to put their properties in shape just as soon as possible for increased traffic. The largest order of the past few weeks was that of the Union Pacific Railroad Company, which announced plans for purchasing $10,000,000 worth of new equipment to be delivered in the next six months.

Monongalia Miners Make Armed March

UNION mine workers on Scott's Run, Monongalia County, W. Va., made an armed march and demonstration on Jan. 4 against the men at the mine of the Gilbert Davis Coal Co.'s plant, who were thought to be meditating a return to work at a scale below that which the union agreement prescribes. The mine had been closed down for some time, and E. H. Gilbert, the president, denied that the mine would be started on an open-shop basis at the time alleged.

On Jan. 7 a demonstration was staged at the Bunker Hill mine and the workers were induced to leave the workings. At the Almina mine on the Monongahela River between Fairmont and Morgantown a demonstration of a similar kind was made. The Bunker Hill mine has been running as a non-union mine for several months, and the Almina mine has tried to operate several times as an open-shop operation. Sheriff Yost refused to interfere with the march unless formal complaint was made of a specific violation of the law and unless warrants were sworn out against the marchers for some particular offense.

The Grand Jury of Monongalia County has brought indictments against fourteen men for taking part in the demonstration and against ten men for the theft of dynamite, pistol carrying and assault and battery.

The grand jury also returned an indictment against R. M. Williams, described as an organizer of the United Mine Workers, charging complicity in assaults upon non-union miners and the dynamiting of a house owned by the Connellsville Basin Coal Co. It further returned true bills against six other men, growing out of the strike which has nominally been in progress in Monongalia County since 1920.

Pennsylvania Will Collect Anthracite Tax

SAMUEL S. LEWIS, Auditor General of Pennsylvania, will collect the anthracite tax, notwithstanding the fact that the constitutionality of the act of 1921 has been attacked in the Dauphin County Court. All firms, corporations and individuals engaged in the mining and production of anthracite in the state will soon receive from the Auditor General blanks for filing tax returns.

The law imposes a tax of 1½ per cent on the assessed market value of all anthracite mined in the state. The duty of assessing the coal or fixing the tonnage value is placed on superintendents or other officers in charge of mines, washeries or other productive operations, as distinguished from the corporations or firms conducting the business themselves, and it is therefore probable, it was said at the Auditor General's department, that in a number of instances the larger corporations will be required to furnish a series of separate reports representing individually the operations of each of their collieries.

Auditor General Lewis has sent a letter to all operators requesting their co-operation to the end that any embarrassment, incident to the imposition of penalties in the event that the act is held constitutional may be avoided.

Washery operators and persons procuring coal from the Susquehanna, the Lehigh and the Schuylkill rivers and other streams are regarded as falling within the purview of the new law and it is their duty to file reports whether they receive blanks or not. The penalty for non-compliance with the act is a fine of $500 and imprisonment for one year or more.

Nova Scotia Court of Appeals Suspends Injunction Against Wage Cut

THE board of conciliation appointed by the Canadian Department of Labor to investigate the dispute between the British Empire Steel Corporation and the coal miners is composed of the following: U. E. Gillen, general manager of the Toronto Terminals Railway Co., chairman; Colonel W. E. Thompson, Halifax, representing the corporation, and James Ling, Mayor of New Waterford, N. S., representing the miners.

The injunction issued by the Supreme Court restraining the British Empire Steel Corporation and constituent companies from reducing the wages of coal miners pending the investigation by the conciliation board has been suspended by the Nova Scotia Court of Appeals. The injunction was issued on the ground that under the Industrial Disputes Act no change can be made in working conditions while conciliation proceedings are in progress. The Court of Appeals holds that as the agreement between the corporation and the unions expired at the end of the year, there is no "existing rate of wages." The corporation will pay the reduced rate until a final judgment on the question has been rendered.

Shipments of Anthracite in December Were Smallest Since 1920 Vacation Strike

SHIPMENTS of anthracite during December, 1921, as reported by the Anthracite Bureau of Information, decreased approximately 1,800,000 tons as compared with the corresponding month of 1920, and of nearly 680,000 tons as compared with November. Shipments last month (4,635,922 gross tons) were the smallest since September, 1920, when the "vacation" strike of the mine workers reduced the shipments to 3,592,954 tons. Total shipments for the year 1921 amounted to 67,617,713 tons against 68,627,125 tons in 1920.

Shipments by initiating carriers were as follows:

	Dec., 1921	Dec., 1920	Nov., 1921
Philadelphia & Reading	985,262	1,324,004	1,017,409
Lehigh Valley	801,796	1,161,305	913,737
Jersey Central	532,597	497,735	512,613
Lackawanna	626,377	940,515	814,131
Delaware & Hudson	654,987	896,475	756,598
Pennsylvania	307,520	457,242	429,638
Erie	450,465	675,979	503,488
New York, Ontario & Western	107,107	164,557	136,945
Lehigh & New England	169,811	318,508	229,455
Totals	4,635,922	6,436,320	5,314,014

Railroads Oppose 28 Per Cent Reduction In Rates in Southwest

THE Interstate Commerce Commission is considering proposed reductions of 28.5c. on bituminous coal, lump and slack from points in the Pittsburg (Kan.) district mines in Kansas, Missouri, Oklahoma and Arkansas and mines in the Springfield (Ill.) district to Kansas City. Southwestern roads have protested against the reduction from the Springfield (Ill.) district because the differentials will be interfered with, and the Chicago & Alton R.R. makes the same objection against the reduction from the Southwestern fields, saying that all reductions have been justified if those from the Southwest are given effect. The Southwestern coal operators ask that the reductions from the Southwest be allowed to go into effect and that all others be suspended. Various interveners have contended that the reductions are not justified.

A Warm Year, 1921

ST. LOUIS reports that 1921 was the warmest year on record. This will account in a way for the poor coal business. The mean temperature for the year was about 60 degrees. The highest for the previous 50 years was 58.3 degrees in 1900. The normal annual mean temperature is 56 degrees. The average daily excess over normal for the year was 4.1 degrees. No heat record was broken; the highest of the year was 98 deg. F. on July 13. The lowest was 12 above on Jan. 17. Every month in the year was warmer than normal.

THROUGH A CO-OPERATIVE AGREEMENT with the Pennsylvania Geological Survey, the U. S. Bureau of Mines has exercised general supervision of the sampling of a large number of coal mines in western Pennsylvania and has also analyzed the samples. Under similar agreement with the Sewalls Point Coal Exchange, about 100 mines along the line of the Virginian Ry. have been sampled by engineers under the direction of the bureau.

No Agreement Reached in Georges Creek And Upper Potomac Regions

AFTER three days of parleying in Baltimore, on Jan. 10, 11 and 12, representatives of the operators and miners of District 16, United Mine Workers of America, which comprises the Georges Creek and Upper Potomac fields, failed to reach an agreement on a scale of wages and working conditions to replace the existing wage contract, which expires on April 1. No agreement is likely to be consummated.

One of the demands of the representatives of the miners was for a fixed wage scale covering the period between April 1, 1922, and March 31, 1924. The operators refused to entertain that demand on the ground that changes in market and general economic conditions made it undesirable as well as unfair to enter into such an agreement. This was the question upon which final disagreement came, the conference breaking up soon after this demand had been made and rejected.

In an attempt to negotiate a new contract the operators proposed an agreement from which the provision in the existing agreement confirming the award of the U. S. Bituminous Coal Commission was stricken out. The miners lodged objection to that, asserting that the commission had stipulated that the wages of miners must be maintained on a certain level. The operators took the position that the award of the commission had no such effect and had, moreover, long ago ceased to exist.

Although the miners proposed that the old agreement be adopted they later withdrew that offer. One of the counter propositions made by the operators was that an agreement be entered into under the terms of which fixed wages and hours for the entire district were not to constitute a part of any agreement but that the matter of wages and hours should be left to the miners and operators in various localities. As the miners felt that this would weaken their organization, they declined to agree to it.

Inability of the operators and miners of District 16 to agree upon a new contract or to reach any agreement as to an adjustment of wages leaves about 90 per cent of the mines in Maryland shut down and means that production will be restricted to about 20 per cent of potential capacity unless action is taken by miners and operators independent of the United Mine Workers' organization, as has been done in some cases.

In some quarters the opinion is entertained that, regardless of the wishes of the union, a way will be found to work out an agreement with the mine workers as individuals. It is not believed that the door is closed to further negotiations with the miners' union.

The following rates now in effect for mining coal and for day labor, operators contend, make it out of the question for them to compete with other fields where a lower wage scale is in effect: Pick mining, $1.31 a ton; drivers and inside day laborers, $7.42 for an eight-hour day; dumpers, $6.88; motormen, $7.42. Production is now restricted to about 600,000 tons per annum as against the normal production of 3,000,000 tons per annum.

Testing Society Committee Rejects Coal Contract with Analytical Provisions

PURCHASE of all coal on a contract form providing specifications based on analysis, a form recently advocated by many purchasing agents, has been considered and rejected by a special committee on coal of the American Society of Testing Materials. This committee has been meeting in New York at regular intervals for several months and has given the subject full consideration from the standpoint of the seller, buyer and testing and combustion engineers.

It is understood that this committee will make a report along these lines to the main committee of the society in Philadelphia next month.

While no formal report has been made by the committee as to its conclusions regarding a form of contract for the purchase of coal, it is understood that it will recommend that the purchaser determine by actual tests what coals are best suited to his individual requirements and make a contract along those lines, giving analysis of coal desired and stating the mine or mines from which the coal is to be shipped.

If it is desired to have a premium and penalty clause in the contract it is thought it should be based on the ash content of the coal, making the amount of the premium and penalty base, to be determined in each individual case, on the actual cost of coal delivered and the expense of handling the excess ash.

The members of the committee are:

Hubb Bell, sales chemist, U. S. Testing Co., chairman; George H. Bayne, Emerson & Morgan Coal Mining Co., New York, secretary; Andrew B. Crichton, consulting engineer, Johnstown, Pa.; H. S. Fleming, consulting engineer, New York City; L. C. Frey, fuel engineer, Lehigh Coal & Navigation Co., Lansford, Pa.; John McNally, vice-president and fuel engineer, Fuel Service Co., New York City; J. D. Monie, vice-president and sales manager, Johnstown Coal & Coke Co., New York City; Henry M. Payne, consulting engineer, New York City; Alfred D. Thompson, bituminous sales manager, Pattison & Bowns, New York City, F. R. Wadleigh, chief of Coal & Coke Section, Fuel Division, Department of Commerce; Robert Johnson, Hecker-Jones-Jewell Milling Co., New York City; H. L. Ogden, purchasing agent Gas & Electric Utilities, Boston, representing the National Association of Purchasing Agents; H. L. Holstein, chemist, New Jersey Zinc Co., Palmerton, Pa.; J. C. Phillips, supervising engineer, New York Steam Co., New York City; Edwin B. Ricketts, New York Edison Co., New York City, representing the National Electric Light Association: Oscar Texter, consulting engineer and chemist, Cleveland, Ohio, and John Van Brunt, chief engineer, Combustion Engineering Corporation, New York City.

Hultman Asks Massachusetts Dealers to Refuse Shipments of Poor Anthracite

MASSACHUSETTS is getting some bad anthracite, according to State Fuel Administrator E. C. Hultman, who asks dealers to co-operate with him in stopping this influx by refusing poor shipments. The appeal is made in a statement issued Jan. 17 which is accompanied by statistics to show that New England took more anthracite during 1921 than in the better year 1920 and that Massachusetts right now is heavily stocked with almost a million tons of it. Mr. Hultman's declaration about inferior coal follows:

"Anthracite coal which not only fails to conform to sizing specifications but contains such a high percentage of impurities that its heating value is materially reduced is being forced and foisted upon the dealers and subsequently upon the public. This low heating value results in a real cost for fuel much greater than even the present high prices indicate.

"The coal market has now shifted from a sellers' to a buyers' market, and dealers are responsible for their purchases. Therefore, I request the co-operation of all dealers in improving the quality of standard of domestic fuel and conserving our transportation facilities by refusing to accept shipments of poor quality coal."

Mr. Hultman reports that deliveries of anthracite to Massachusetts during the coal year ended March 31, 1921, totaled 5,207,643 tons. Of this, the carry-over was 808,000 tons. Receipts between April 1 and Dec. 31, 1921, were 3,945,553 tons, making stocks and receipts for nine months up to Dec. 31, 1921, total 4,753,582 tons. Stocks of domestic sizes carried into January, 1922, show 934,770 tons as compared with 261,993 tons in January of 1921. Thus Massachusetts is well stocked with anthracite for the time being.

All New England took 103,000 tons more of anthracite during 1921 than the same states did in 1920, as the following table, issued by Administrator Hultman, shows:

RECEIPTS OF ANTHRACITE IN NEW ENGLAND BY CALENDAR YEARS

(In Net Tons)

		Per Cent Tide	Per Cent Rail
1916	10,715,000	49	51
1917	11,680,000	38	62
1918	13,621,000	30	70
1919	10,578,000	31	69
1920	11,255,000	31	69
1921	11,358,000	33	67

Reduction in Coal Freights Now Seems Less Likely; Morrow and Cushing Suggest Cuts

By Paul Wooton

Washington Correspondent of Coal Age

WHAT is the Interstate Commerce Commission going to do about freight rates? While many observers present at the rate hearings last week still hope for a general reduction of 15 per cent, it is obvious that the commissioners are not convinced that a reduction would produce sufficient tonnage to maintain the railroads' revenue at a fair figure. Shippers' testimony, especially that of coal men, has all indicated that rail traffic is sufficiently heavy to make the 1921 rates inequitable. But all this evidence was based on October traffic. Railroad business since then tells a different story, so that the commission, with the reports of a whole year before it, charged as it is with the duty of making rates that will guarantee the roads a fair return on invested capital, may hesitate to order reductions until prospects of good business are more definite.

It is generally admitted that the case for coal was ably presented by J. D. A. Morrow, vice-president of the National Coal Association, and George H. Cushing, managing director of the American Wholesale Coal Association. The bulk of Mr. Morrow's testimony was printed last week in *Coal Age* (pp. 145-6) and Mr. Cushing's appears in this article. Mr. Cushing presented statistics to support his contention that railroad operating revenue can be reduced 13.87 per cent without endangering a return of 6 per cent on the value of the roads. Mr. Morrow, pointing out that railroads will pay approximately $215,000,000 less for fuel this year than they did last year and that their other costs are decreasing, suggested to the commission that if a general rate reduction be made, it should apply to coal first and that 75c. a ton would be a fair reduction.

Wages Are Falling in Non-Union Fields

Mr. Morrow, supplementing the statements reported in these columns last week, told the commission that mine wages are going down—already have receded to the 1917 level or lower in non-union fields—and that they "must be reduced on April 1 next, although to what extent the National Coal Association cannot attempt to say."

He said that further wage cuts would "result in some lowering" of the price of coal, but mine prices have already been reduced so much to meet non-union competition that coal production the country over is now going on at a loss. He quoted from reports of all the operators reporting to his association—operators who produced 55,460,000 tons during the seven months from April 1 to Oct. 31, 1921—showing that there was an average loss of 2c. a ton among them. He said reports for November and December showed even further losses.

In the questioning which followed Mr. Morrow's address Commissioner Hall held that high rates to tidewater, which Mr. Morrow thought should be reduced $1, might not have been the main cause for America's loss of foreign markets. He suggested that poor quality of coal cut a figure. Members of the commission also doubted whether Mr. Morrow was right in prophesying a miners' wage reduction after April 1. He replied that in view of the conditions and of the relationships between union and non-union mines it is entirely reasonable to expect such a reduction.

Mr. Morrow declared foreign coal can come into this country right now and compete with the native product because of high rates here. He said Japanese, Australian and even Cardiff coal is selling today in California at a price less than the freight rate on Utah coal shipped to the coast.

Answering another question, Mr. Morrow said the development of water power would reduce bituminous demand temporarily, but that industrial expansion due to cheap power ultimately would increase that demand.

With his testimony Mr. Morrow presented statistical exhibits covering twenty pages. Among other things these exhibits show:

The percentage which cost of fuel and power constitute of the total cost of production in various industries.

Average f.o.b. mine cost of railroad fuel.

Analysis of the present rates per ton-mile earnings, and average distances on coal, in carloads, from the natural sources of supply to all towns with a population of 5,000 or more in the States of Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee.

Former and present rates on bituminous coal from various groups of mines to representative destinations.

Former and present rates on coal, with average distances and rates per ton per mile, from various producing districts to important consuming centers, together with the percentage of advance in these rates.

Former and present rates on coal from mines in Kansas, Arkansas and Oklahoma to representative points in several states.

Former and present rates on coal from various producing fields to representative destinations with percentages of increase.

Subdivision of the dollar paid by a consumer of bituminous coal.

Subdivision of the dollar being received by the bituminous coal operators.

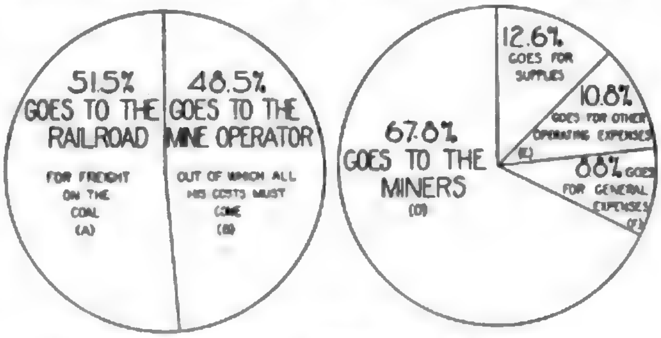
Tonnage, average costs and prices received for bituminous coal by 522 operating companies for the period Jan. 1 to October 31.

Overseas exports of bituminous coal by months in 1921.

Comparison of the relation of increases in freight charges on bituminous coal to the value of the coal, with the same relation shown between freight increases and values of various other commodities.

Mr. Cushing, in his address to the commission, declared the freight rates to big distributing centers average more than $1 a ton above the 1917 level, that this is higher than is necessary to return a fair revenue to railroads and that the returns even now are larger than is necessary to maintain railroad credit.

Glancing back along the history of bituminous coal and rail relations, he said, coal production has gained more than 10,000,000 tons a year for fifty years—for the last twenty years, 17,500,000 tons a year. Even periods of depression have not checked this growth noticeably except at the moment. The 1921 depression, he said, was the most severe in the history of coal mining, with a shrinkage of 26 per cent in production, and this tonnage must be regained as



WHERE THE MONEY GOES WHICH IS PAID FOR BITUMINOUS COAL IN CARLOAD LOTS

What becomes of the dollar paid by a consumer of bituminous coal who buys direct from the mine operator.

What becomes of the dollar now being received for bituminous coal by the mine operator (C).

(A) Average freight per net ton, $2.27. From testimony of George M. Shriver, vice-president Baltimore & Ohio R.R., before the Interstate Commerce Commission Jan. 13, 1922.

(B) Average spot price per net ton, f.o.b. mines, mine run basis, $2.13. From *Coal Age*, Jan. 12, 1922.

(C) Data compiled from reports of members of the National Coal Association for the period April 1-Oct. 31, 1921. The chart shows nothing left for stockholders of bituminous coal-mining companies or for interest paid to bondholders or others and makes no provision for interest on investment, for the reason that the reports show operation at an average loss for the seven months.

(D) Includes all classes of labor at mines.

(E) Includes royalties, depletion, depreciation, insurance and taxes other than federal income and excess profits taxes.

(F) Includes salaries of officers and office employees, legal expense and selling expense.

one of the first visible effects of an industrial revival. He prophesied the gain during the five-year period 1920 to 1925 would be about 25 per cent. This would raise production from 407,000,000 tons, the 1921 figure, to 665,000,000 tons in 1925. This growth is reasonable for the railroads to expect, he said. Since American Railway Association statistics show railroads load a little over three cars of other freight for every car of coal, the roads should have heavy tonnages as soon as coal begins to move.

He filed charts on car loading which indicate, he said, that "bituminous coal tonnage is the mirror which almost perfectly reflects the business of the country. When coal moves abundantly there is an abundant production and shipment of other things. When coal traffic declines the other business of the country decreases proportionately."

To prove his contention that freight rates average more than $1 above the 1917 level he produced this table:

COMPARISON OF COAL RATES IN 1917 AND 1921 TO PRINCIPAL DISTRIBUTING POINTS

Origin	Destination	Rate in 1917	Rate in 1921	Gain	Per Cent of Gain
Springfield, Ill.	Chicago	$1.02	$1.85	$0.83	81.3
Hocking Valley	Detroit	1.30	2.47	1.17	90
Pittsburgh	Cleveland	1.15	2.055	0.905	78.7
Allegheny Valley	Buffalo	1.10	2.36	1.26	114.5
Clearfield	Albany	1.90	3.60	1.70	89.4
Clearfield	New York	1.60	3.11	1.51	94.4
Clearfield	Philadelphia	1.60	3.18	1.58	98.8
Cumb.-Piedmont	Baltimore	1.75	3.18	1.43	81.7
Hazard-Harlan	Cincinnati	1.00	2.10	1.10	110.0
Springfield, Ill.	St. Louis	0.825	1.435	0.61	73.9
Springfield, Ill.	Omaha	2.30	3.645	1.345	58.4
Bluefield	Hampton Roads	1.40	2.884	1.484	106.0

Assuming $3 a ton to be a fair average contract price in April, 1917, and $1.60 today, he pointed out that coal has dropped 46.66 per cent and is still going, while freight has increased 88.16 per cent.

Mr. Cushing then set out to show that unless freight rates are reduced the railroads will increase their coal haulage revenue by $492,990,000 over that of 1917. This is based on an estimated coal production in 1922 of 500,000,000 tons hauled at $2.65—the average freight rate in 1921—making a revenue of $1,325,000,000. In 1917 they handled 551,000,000 tons at $1.41, thus bringing in $832,010,000. The difference is the $492,990,000. If the 1921 rates were allowed to stand and coal production reached 665,000,000 tons, the railroads would get a revenue of $827,260,000 over 1917, which, he contended, would be manifestly unfair to coal and all other industry.

Mr. Cushing stated that the American Wholesale Coal Association believes rates are unreasonable in that they exceed those of April 6, 1917, by 50 per cent, that they are unreasonable on export coal to the extent of $1 per ton, that in any readjustment the differentials as between producing districts in effect April 6, 1917, should be preserved and that 1917 service charges on coal should not be increased because there is less demurrage, less reconsignment and diversion and less service of other sorts required.

A gross margin of 15c. a ton is recognized generally as a fair profit for the wholesaler, but, he said, nobody is able to realize anything today on a reconsigned car because of the service charge of 14c. a ton.

He said that with price at the mines now ranging from $2 to $2.25 and with contracts outstanding at as low as $1.50 the bituminous trade has been losing money heavily. Minimum prices to purchasers on low-cost coals must be $2.15 in carload lots, and high-cost coals, $2.45, in order that the coal man shall make anything at all.

Facing these conditions the wholesaler, with practically no profit, has one chance to save his narrow margin. He can save the reconsignment service charge by divulging to the mine the name of the ultimate buyer. If he does this the mine can offer the coal direct to that buyer at a price undercutting the wholesaler. The Supreme Court has ruled, he said, that a merchant shall not be forced to divulge the names of his customers.

The "ruinous" demurrage and reconsignment charges, he said, which the coal merchant must pay, if he is to change a shipment from one buyer to another, are often used by the first consignee to compel the merchant to reduce his price.

Touching upon demurrage, Mr. Cushing read figures to indicate the average freight car earns 88c. per day when it is rolling, but demurrage is charged at $2 per day for the first four days and $5 a day thereafter. He said the association is willing to pay $2, but the $5 rate is unreasonable.

He then attempted to show what the revenue of railroads would be at the present rates in an average period of activity. Taking 1920 as that average, he pointed out that monthly loadings were 3,693,508 cars. During the last three months of 1920 the new rates were in effect. Mr. Cushing takes railroad earnings for those months and strikes an average which he uses as an average monthly revenue for a year. Had that average been applied to the whole year 1920 the railroads would have earned gross $6,920,492,484.

From 1910 to 1920 70.49 per cent of gross income was used for operating expenses. He estimated railroads now should operate at 70 per cent. This would be $4,844,377,730 based on the "reconstructed" normal year's gross revenue just estimated, leaving a net operating revenue for a normal year of $2,076,147,746. This he insisted is too much. The government in the rate test period allowed the railways only $906,524,492, and the railroads in their protest asserted that they should have received $1,118,940,000.

Thus in Mr. Cushing's "reconstructed" normal year they would be receiving $960,207,746, or 13.87 per cent, above the $1,113,940,000 which the carriers themselves said would pay them 6 per cent a year on their value. Therefore, he concluded, a shrinkage of 13.87 per cent in revenue can now be made by the railroads.

A. H. Campbell, traffic manager for the International Paper Co., New York, testified that two of his company's plants had been forced to install oil-burning equipment because of the high freight rate on coal. He said that practically all other materials used by his firm had been given rate reductions.

C. P. Hoy, of the Fifth and Ninth Districts Coal Operators Association, stated that coal rates from the Illinois mines are so high that operators in those fields have had to stop trying to place their product in Chicago and the Northwest.

Lower coal rates were requested also by companies handling coal on the Northwest docks, the Associated Industries of Massachusetts, the Indiana Coal Trade Bureau, anthracite coal operators, gas companies of Indianapolis and Providence, Buffalo interests, the Kanawha River Improvement Association, the Koppers Co., Seaboard Byproduct Coke Co.; Minnesota Byproduct Coke Co.; Bethlehem Steel Corporation, Chicago Byproduct Coke Co.; Colorado and New Mexico Coal Operators Association, Illinois Coal Operators Traffic Bureau, Illinois Third Vein Coal Operators, Carnegie Steel Co., Illinois Steel Co., National Tube Co., American Sheet & Tin Plate Co., American Bridge Co. and American Steel & Wire Co.

Wages Cut at One Hundred New River Mines

BY the middle of January about one hundred mines in the New River district of West Virginia, or virtually all the companies in that field, had made an independent working agreement with their employees under the terms of which there is a return to the 1917 wage scale, or a reduction in wages of $1.40 a day and 10c. a ton in the mining rate, despite the fact that for several years this has been one of the most strongly organized fields in West Virginia.

The refusal of the union to agree to any scaling down of wages, even though it meant work for the miners, was the cause of its loss of prestige in this district, which comprises the larger part of District 29. Many of the locals have returned their charters to district headquarters. The check-off is discontinued and the companies have been relieved of all contract obligations with the United Mine Workers.

The following wages are being paid: pick mining, room-and-pillar, per ton, 59.11c.; machine cutting, 10.71c.; loading, 47.32c.; motor machine runners, $4.68; brakemen and trip riders, $4.27; skilled wiremen, $4.68; tracklayers and timbermen, $4.55; slate shooters, $4.39; slatemen, $4.15; pumpmen, $4.20; pipemen, $4.55; all other inside labor, $4.10. The outside day-wage scale is as follows: Dumpers, $4.15; top tipplemen, $4.08; trimmers, $4; drum runners, $4.60; cleaners and droppers, $4; blacksmiths, $5; car repairmen, $4.56; greasers and couplers, $4.

Anthracite Convention Calls for Strike on April 1 if 20-Per Cent Wage Increase Is Not Granted

A TWO-YEAR contract; a 20-per cent increase in tonnage rates; a flat increase of a dollar a day for day men; a restoration of the old differentials in cents per day existing before the award of the Anthracite Coal Commission; payment for pillar work at rates not less than that paid for mining coal on the solid; uniformity of rates between collieries for occupations of like character; a uniform eight-hour day; time and a half for overtime and double time for Sundays and holidays; the check-off; all dead work on the same daily rate; all miners on any such work being paid equally; payment for all placing of sheet iron, props, timber, forepoling, extra shoveling and cribbing; consideration rates for miners not working at their regular work for lack of supplies; equity and not precedent as a basis for settling rate disputes; 17c. per inch for all refuse up to 10 ft. wide and proportional increase for all greater widths; payment by the short ton; no dockage; free jackhamers where needed; consideration rate to be made equal to average wage earnings of miners; mine carpenters and other mechanics to get wages equal to local rates and not less than 90c. per hour; adoption of seniority rule in laying off men and rehiring them; powder delivered at working place; short-hour running to be penalized by readjustment of wages and lowering of coal and rent charges were among the demands made by the convention of the mine workers of the three anthracite districts that met at Shamokin, Pa., Jan. 17 and adjourned Jan. 21. If an agreement is not reached by April 1, an immediate suspension of work is ordered. These demands in aggregate will much exceed a 20-per cent increase in the cost of producing coal.

LEWIS COMPARES UNION AND NON-UNION CONDITIONS

With Thomas Kennedy, president of District No. 7, presiding, the meeting was called to order at 10 a.m. on Jan. 17 in the Family Theater, Shamokin, 381 delegates being in attendance. John L. Lewis, international president of the United Mine Workers, being introduced as permanent chairman, made an address in which he contrasted the conditions of the unionized anthracite mines with those in the Pocahontas region of the Virginias, the Alabama regions, the Big Sandy field of Kentucky and other non-union areas. In the non-union fields the men live in unincorporated towns owned by the coal corporations. They had, he said, no halls, no churches and sometimes no schools. A man who joins the union is discharged and evicted and "the only legal authority is the coal company, which enforces its decrees by armed guards." He declared that these conditions were a disgrace to American ideals and could be brought before the American public only through the United Mine Workers of America.

"The anthracite region," said Mr. Lewis, "is the one bright spot in the country from the standpoint of employment. The bituminous industry is in a deplorable condition. Though the potential production of the bituminous coal areas is 800,000,000 tons a year, in 1921 their output was only 407,000,000 tons, representing an average proportion of unemployment of 50 per cent. The production of 1921 was practically that of 1911, when the output was 405,000,000 tons.

"Surely such a deplorable condition makes it necessary to spread over the output a tremendous overhead cost and loads on the American public millions of dollars of expense. It clearly demonstrates the need for the working out of some manner of regulation by which coal may be produced more regularly and men may be given an opportunity to work more steadily. Congress must plan some way to protect capital, the public and the men engaged in the industry in a manner impossible under present conditions.

"More than 200,000 men are out of work, some work a day in a month and others one or two days a week. Some men have not worked a single day since 1920, yet they and their families must eat. If they are permitted to work only 150 days a year they must, nevertheless, earn enough to enable them to eat 365 days.

"The talk of reducing the wages of miners is idle. The great minds of our nation must devise a new method which will correct the conditions in the soft-coal regions. Though anthracite mine workers have more working days than those in the bituminous regions, they are compelled to work harder in proportion to their pay and are entitled to better conditions and wage adjustments.

"It makes no difference to the anthracite mine workers that the men in other industries have had their wages reduced. We do not propose to have our standard of living lowered because of the working conditions in non-union fields. We shall oppose the application of the non-union yardstick to our standards of living.

"Mine workers never have been paid in a manner commensurate with their hard labor and hazardous employment. For a long, long time they have been regarded too much as laborers. The Anthracite Commission did not award them a wage commensurate with the cost of living. The award was made with the understanding that the living costs would be reduced, the commission believing that it had made a scale in accord with that anticipated decline, but the lowering of the cost of living has not been as great as in the assumption on which the award was based. To accept reductions here because of wage cuts in the non-union fields would result in lower standards of living, which would add to the problems of the worker's life.

"The mine worker is not responsible for the price of coal. His wages are relatively small compared with the price the public must pay. A friend told me in Philadelphia that he paid $14.75 for a ton of nut bituminous coal, yet the miner did not get over $1 for mining it and the cost at the mine did not exceed $1.75.

DENIES DESIRE OF MINERS TO PRECIPITATE STRIKE

"The mine workers do not desire any cessation of work after April 1. They expect the operators to meet them and arrange a contract for the ensuing contract period, and if such a contract cannot be made in this conference which the United Mine Workers of America request, the mine workers will not be at fault."

At the close of Mr. Lewis' address the convention adjourned till 2 p.m., when an unimportant session was held, committees being appointed and the roll of delegates being called. The next morning John Brophy, chairman of the Nationalization Committee and president of the central Pennsylvania district, addressed the convention, declaring among other things that the operators were circulating vicious propaganda declaring that the mine worker is responsible for the high price of coal, depicting the toiler in the mine as a hold-up man, the enemy of public welfare and public interest, this being done to distract the public so that it will not inquire too closely into the operator's vices.

A reduction in wages, he said, was no cure for the financial depression, for in the steel industry although wages have been so greatly reduced that they will no longer sustain life, the plants as a whole are operating only one-third of full time.

According to Mr. Brophy the operator, wasteful, both in his mining and in his marketing methods, is responsible for the high price of coal. He is also prodigal of human life. Although more men are employed in Great Britain than in the United States only half as many lives are lost in the industry of that country.

Mr. Brophy alleged that no one knows the value of the coal properties of the country or how much water is concealed in the stock issued by coal companies.

Christopher Golden, president of District No. 9, with headquarters at Shamokin, followed Mr. Brophy, arguing that the price of coal was regulated by a coal operators' union and that every mine in the anthracite region was getting a fair profit and 90 per cent of them one that was more than fair. The public should get cheaper coal, but to attain that end it was not necessary to reduce the wages of the mine workers, and that fact the union was prepared at any time to prove. The owners of the land were reaping large royalties. In the mines of the ninth district some were as much as $2.75 per ton. With such royalties why wonder that anthracite is selling at so high a price? He alleged that coal produced in his district at $4.20 per ton is selling at points to which it is hauled 20 miles by train at $15. The operators were anxious to avoid an investigation, and in 1920 were willing to pay any increase demanded if by so doing they could avoid an inquiry.

President Harding, said Mr. Golden, says we must "get back to normalcy." Big business interests interpret that statement to mean that we must return to the low wages and high profits of 1916. Only one great labor organization exists that has not been broken by the big interests, and that is the United Mine Workers of America. Other speeches of less importance were delivered at the morning session. As the resolutions committee was not ready to report, the convention adjourned till 9.30 a.m. on Thursday, Jan. 19.

When the sessions resumed, the resolutions committee was still not ready to report, and J. H. Maurer, president of the State Federation of Labor, made an address, being followed by Phillip Murray, vice-president of the United Mine Workers, who in an eloquent address congratulated the mine workers on their splendid co-operation in the wage negotiations before the Anthracite Commission and on the way in which they had accepted the decision. Any industrial turmoil that may follow the failure to make a new agreement will not be chargeable to the mine workers. They are desirous of adhering to their old-time policy of avoiding industrial strife.

Wage reductions, said Mr. Murray, will not result in a renewal of industrial activity. In Alabama wages have been reduced to $1.80 for a nine-hour day, but where this wage has been established the men are not working any more steadily than they are where the union is so strongly entrenched that wages have not been lowered. The employers posted notices at the mine mouths promising steady work if the wage cuts were accepted, but no such steady operation resulted. The same is true in District 19 of Tennessee, where the wage rate was reduced to $3.44 per day and similar promises were made. The average working time since the cut went into operation has been one and one-half to two days per week. The union is determined not to allow wages to be lowered, for at their present level they would be insufficient to enable the men to receive a proper living even should they obtain steady work.

Difficulty has been experienced in bringing about a conference in the Central Competitive Field. In refusing to meet the mine workers the operators have violated the terms of their agreement. In Mr. Murray's opinion the operators were holding off for fear that legislation now before the Senate of the United States will set up a coal board like that which regulates railroad wages.

The Kenyon bill, said Mr. Murray, would try to prevent representatives of the mine workers from negotiating another wage agreement and would place labor in the same category as a dozen of eggs or a bushel of potatoes. Such compulsory arbitration would restrict the rights and liberties of trades unions and the convention should go on record by passing a resolution opposing the bill. The union is opposed to the so-called "American" plan of "open shop." It means that no union man would be able to obtain work. The erection of the national wage board is an attempt by legislation to establish such a method of working. Will an operator sit down, said Mr. Murray, and earnestly try to negotiate an agreement when he can "pass the buck" to a labor board?

Referring to the internal troubles of the International Union Mr. Murray said that the union was founded on collective bargaining and on the duty of honorably carrying out the contractual obligations thus resulting. Direct action which fails to recognize the force of contracts is suicidal. Though not believing in the Industrial Relations

Anthracite Miners' Nineteen Demands, All of Which Will Increase Production Cost

1. We demand that the next contract be for a period not exceeding two years and that the making of individual agreements and contracts in the mining of coal shall be prohibited and where mechanical loading is done the committee and company officials shall have authority to establish proper rates.

2. We demand that the contract wage scale be increased 20 per cent and that all day men be granted an increase of $1 per day and further that the differential in cents per day existing between classifications of labor previous to the award of the U. S. Anthracite Coal Commission shall be restored and that the rates applied in solid mining shall be the minimum rate on pillar work or second mining.

3. In conformity with the thought expressed in the award of the commission we demand that a uniform wage scale be established so that the various occupations of like character at the several collieries shall command the same rate of wages.

4. We demand that the provisions of the eight-hour day clause in the present agreement shall be applied to all persons working in or around the anthracite collieries coming under the jurisdiction of the U. M. W. of A. regardless of the occupations and that in the bringing of these employees under the eight-hour day their basis shall be arrived at in the same manner as the basis was arrived at in the case of pumpmen and engineers plus the increase demanded in Section 2 of this document, and further that inside day laborers shall work on the basis of eight hours underground.

5. We demand time and half time for all overtime and double time for Sunday and holiday work.

6. We demand that the next contract made between the representatives of the anthracite operators and the United Mine Workers of America shall contain a standard check-off provision.

7. We demand that all dead work shall be paid for on a uniform consideration basis and that where more than one miner is employed they shall all receive the same rate.

8. We demand payment for all sheet iron props, timber, forepoling, extra and abnormal shoveling and cribbing and that where miners are prevented from working on account of lack of supplies they be accorded the opportunity of making a shift at some other work at the consideration rate.

9. We demand in the settlement of grievances that the aggrieved parties shall have the right to demand settlement upon a basis of equity and if such equity settlement is requested the conditions of 1902 shall not enter into or prejudice the case.

10. We demand that a uniform rate of 17c. per inch be paid for all refuse in all kinds of mining up to 10 ft. wide and a proportional rate be applied for over 10 ft., with the understanding that this is to be a minimum rate, not affecting higher rates that exist.

11. We demand that where coal is paid for by the car this method shall be changed and payment shall be made on the legal ton basis of 2,000 lb., and that dockage shall be eliminated.

12. We demand that where jackhamers are necessary and of advantage in the work they be furnished free of charge to miner or miners, including the power necessary to operate the machine.

13. We demand a more liberal and satisfactory clause in the agreement covering the question of miners who encounter abnormal conditions in their working places and that to correct this situation the following quotation: "Unless otherwise directed by the foreman," shall be stricken from the agreement covering this particular subject and that the consideration rate at each colliery should be equivalent to the average daily earnings of contract miners under normal conditions.

14. We demand that the wage schedules be brought up to date, containing all new rates and occupations, and that copies be supplied the committees and filed with the Board of Conciliation.

15. We demand that carpenters and other tradesmen be paid the recognized standard rates existing in the region, which rate should not be less than 90c. per hour and which trade rate should be paid to all those who have served four years at their particular trade.

16. We demand that seniority shall apply when, owing to retrenchment, men are laid off. The same rule shall hold when men are rehired.

17. We demand that employees of stripping contractors be brought under the general agreement on their present basis of wages and conditions plus the increase demanded in Section 2 hereof.

18. We demand that powder be delivered by the company to the miners at their working places, or as convenient as possible to the working place and in a safe and careful manner.

19. We demand that full eight-hour opportunity be given to employees at collieries which have been working as a general rule on a six- and seven-hour-day schedule and that where eight-hour opportunity is denied to those employees their wages shall be readjusted—this demand is based upon normal working conditions and does not contemplate the inclusion of accidents.

We recommend that our scale committee use every effort to have the operators agree to some provision in the agreement regarding the price of coal and rent to be charged the employees.

The committee recommends that the scale committee to negotiate the contract shall be composed of the officers, the executive board members of the three districts, together with the resident International officers and three mine workers from each district affected, the district president to select the three mine workers in each district, subject to the approval of the Executive Board.

We further recommend that the scale committee be instructed to perfect arrangements providing for a suspension of mining on April 1, 1922, in the event that no satisfactory agreement has been arrived at as of that date.

Court of Kansas, the International officials believe it should be fought in a fair and legal manner. They are seeking its repeal or to have its provisions declared unconstitutional and are doing this in a fair and legal manner and not by direct action. The ex-officials of the Kansas district have, however, called a strike where the union and the operator have no grievance; thus they are not honorably carrying out their contractual obligations. After an adjournment till 2 p.m. the convention listened to an address by W. D. Ryan, a former official of the union and now a member of the Bureau of Mines. At length the resolutions committee reported. Among the resolutions presented Nos. 1, 2, 6 and 7 were notable. A recitation of their terms follows:

Resolution No. 1 declares that whereas members often violate contracts by striking without even presenting grievances to excuse such action, and whereas this violation of the contract by union members if not retrained sometimes establishes precedents that later cause confusion and trouble. Therefore be it resolved that any local union which discovers a member violating the provisions of the agreement, without having taken the proper steps to have his rights protected, should be charged by the local union with an offense against the organization and be fined or otherwise punished to a degree in keeping with the gravity of the offense.

Resolution No. 2 recommends that the legislative committee try to have introduced before the Legislature in Harrisburg rent laws similar to those in force in the State of New York. Resolution No. 6 endorses the Kansas program of the International officials.

Resolution No. 7 declares that the convention is in no wise opposed to any measure providing for the collecting of all the facts relating to the mining industry but rather welcomes such action, but that it most earnestly protests including in such bills any limitation of the miners' right to strike or any provision for compulsory arbitration.

After the approval of the resolutions Secretary-Treasurer Green addressed the convention and the meeting adjourned. On the next day, Friday, Jan. 20, the wage scale committee presented its demands. These were adopted and may be found in a box accompanying this article. The only change which the convention made in the original demands was to add the last clause in the fourth demand providing "that inside day laborers shall work on the basis of eight hours underground." The convention ended at 10 p.m.

Coleman-Weaver Controversy Settled

It is understood that a settlement of the long-drawn out controversy between the Coleman and Weaver coal interests in Pennsylvania took place recently. The Coleman faction formerly operated the mines of the Nanty-Glo Coal Mining Co., while the Weaver interests operated the Colver Mine as the Edensburg Coal Co. and the Revloc property as the Monroe Coal Mining Co. Under the new arrangement Mr. Coleman obtains the Colver mine and the operations at Revloc and Nanty-Glo pass to the control of Mr. Weaver. It is reported that Mr. Coleman will have his own sales organization to handle the output of the Colver operation.

ARTHUR S. LEAROYD becomes associated with the sales organization of Thorne, Neale & Co., Inc., effective Feb. 1, 1922, with jurisdiction over New York and New England territory. His offices will be in New York. The vacancy in the sales department caused by the death of Charles F. Randolph, several months ago, is thus filled. Mr. Learoyd retires from the position of vice-president of the Lehigh Coal & Navigation Co. to take up his new connection. He was formerly a railroad man and was general freight agent of the D. L. & W. R.R. for several years prior to the war. In 1918 he became director of the Bureau of Anthracite of the U. S. Fuel Administration and later was on the anthracite distribution committee, with offices in Philadelphia.

PENDING INVESTIGATION BY GOVERNMENT AGENTS of conditions existing among coal miners in the West Virginia fields, officials of the New River Coal Co. and the New River Coal Operators Association have postponed the contemplated eviction of unemployed miners from the company houses.

Federal Trade Commission Made Coal-Cost Inquiry on Own Initiative

Admission that the Federal Trade Commission instituted its coal-cost production statistical inquiry at its own suggestion rather than on the direction of the President or Congress, which may have an important bearing on decision of the authority of the commission to require such cost data in pending court cases, was made before the House Committee on Appropriations by Chairman Gaskill. He was before the committee explaining appropriations for the coming year, the subject coming up on questions of the committee. Representative Griffin, of New York, observed that it appeared to him that production-cost investigations were being duplicated in that they were being conducted by three government agencies, the Federal Trade Commission, the Department of Commerce and the Tariff Commission.

Chairman Gaskill said these investigations were different from those conducted by the Federal Trade Commission, and stated that the commission did not institute economic cost studies except on order of the President or Congress. He then admitted that the proposal to determine production costs in coal were instituted by the commission on its own initiative, it having been suggested to the House Appropriations Committee by a member of the commission, and authorized by that body in an appropriation bill during the war.

Navy Receives Many Bids, Ranging Widely, On Coal for Great Lakes Station

A large number of companies have submitted bids to the Navy Department on furnishing coal for the Great Lakes Training Station at Chicago. The bidders are: C. B. Blake & Co., Cincinnati, $2.24 per ton, f.o.b. mines; also $1.55; Walter Bledsoe & Co., Terre Haute, Ind., $2.50; Boehmer Coal Co., St. Louis, $3.07; D. C. Campbell Coal Co., Knoxville, $2.52; Crerar Clinch & Co., Chicago, $2.80; Coalfield Fuel Co., Boncar, W. Va.; $1.68; Davis Coal & Coke Co., Baltimore, $2.69; Elkhorn City Fuel Co., Johnson City, Tenn., $1.02 and $1.05; Ender Coal & Coke Co., Chicago, $2.78; Hedstrom-Schenck Coal Co., Chicago, $2.64; George A. Emos Coal Co., Cleveland, $2.64; Lake & Export Coal Sales Corporation of Illinois, Chicago, $2.09; Morgantown, W. Va., Coal Co., $2; O'Gara Coal Co., Chicago, $3.35; Old Ben Coal Corporation, Chicago, $3.24; Peabody Coal Co., Chicago, $2.80; Roberts Coal Co., $2.23; Manganon Coal Co., Springfield, Ill., $2.46; Sterling Midland Coal Co., Chicago, $2.63; Stoptlmeyer Coal Co., Hathaway, W. Va., $1.90, and West Kentucky Coal Co., Paducah, $2.24.

Quiz Jobbers and Retailers on Coal Prices

Agents of the Department of Justice are asking wholesale and retail anthracite and bituminous coal dealers for information as to coal prices, according to the American Wholesale Coal Association. This is understood to be part of the program of the department in its investigation as to the reasonableness of fuel and other prices. According to the coal association some of its members have been called on by representatives of the Department of Justice for information as to coal prices, being furnished with a blank form on which the information was to be given. The questionnaire covered various grades of coal handled by the dealer, the prices paid by him and the prices at which sold to his consumer. The association says that all war measures which seemed to allow these invasions of private rights have been repealed.

Columbus Awards Municipal Coal Contract

The Columbus (Ohio) Board of Purchase has awarded the contract to supply 6,500 tons of Hocking nut, pea and slack to the municipal lighting plant; 4,000 tons of Hocking nut, pea and slack to the Scioto River pumping station and 1,500 tons of Hocking nut, pea and slack to the garbage reduction plant to the Sunday Creek Coal Co., at $1.45 f.o.b. mines. This was the low bid when proposals were opened Jan. 11 by the board.

Production and the Market

Weekly Review

JANUARY sales of bituminous coal have failed to come up to anticipations. While the tonnage moved has exceeded the December business, the new year has not yet brought the volume of orders that was expected to follow the removal of the freight tax and other deterrent factors.

There is no doubt, however, that the coal industry will enjoy better times between now and April 1. This is indicated by a heavier line of inquiry. There is not the least indication that there will be any rush for coal, but the strike talk and the growing certainty of a tie-up are causing buyers to ask for prices and the possibility of prompt shipment.

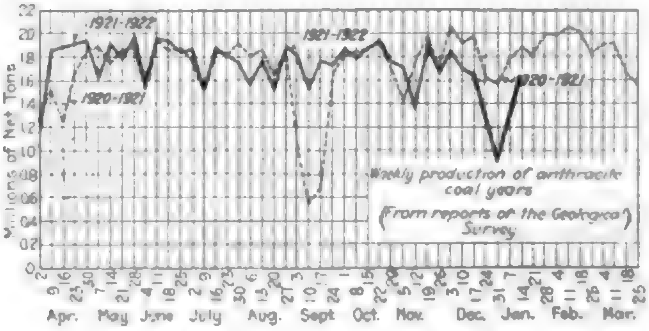
Purchasing agents are on the anxious seat. Their argument that lowered freight rates are likely to come tends to restrict buying, while the impending miners' wage controversy prompts the securing of an adequate reserve. Labor developments in the immediate future will tell whether or not buyers are to throw their price views into the discard and insure their requirements over the period when trouble may be expected.

LARGER OUTPUT ABSORBED; FEWER DISTRESS PRICES

Any impetus given the spot market by this strike talk will be only temporary. Coal sellers as a rule are not crying "wolf," but are permitting the buyer to figure out the situaton for himself. Industrial improvement is continuing, but very slowly, and it is realized that a return to a healthy market will be equally slow. The industrial situation is difficult to analyze. There are signs of betterment in some lines, which are offset by declines in others, but the aggregate result is a slight upward trend.

A better line of domestic buying has made inroads on dealers' stocks. The increased movement of lump from the mine has eased the screenings market. The average retailer, however, is not reordering heavily and it is apparent that he will go into the new coal year with yard supplies as light as possible, in order to start next season's business on the lower-cost basis which is sure to result from the new wage agreements.

The Tidewater situation is quiet. Dumpings at the Roads increased last week, New England and bunker markets absorbing the heavier tonnage. Pier accumulations are heavier, following the resumption of mining in the Southern fields, where wage cuts have made lower prices possible.

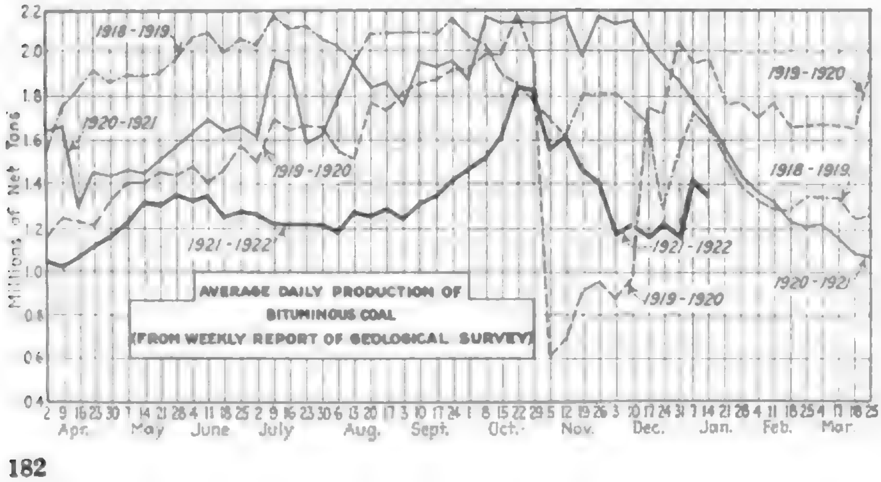


Anthracite is in better call. This has resulted in heavier operations, although the market is too sensitive to permit any increase in prices for the independent domestic sizes. Steam coals are moving more readily and prices are now in line with company schedules.

BITUMINOUS

Production during the week ended Jan. 14—a full-time week—was 8,268,000 net tons, according to the Geological Survey. This is a larger output than for any week since late in November and production is now back on a level with September, before the impending railroad strike bolstered the demand. Loadings on the first two days of last week—Jan. 16-17—exceeded those of the previous week by 930 cars.

Current production is testing out the extent of the increase in industrial requirements. The recent subnormal output was caused by the low rate of consumption, which in 1921 was 76 per cent of 1920. On Nov. 1, 1921, con-



Estimates of Production

(Net Tons)

BITUMINOUS COAL

Week Ended:	1921 1922	1920 1921
Dec. 31	5,986,000	9,686,000
Jan. 7 (b)	7,450,000	9,633,000
Jan. 14 (a)	8,268,000	10,763,000
Daily average	1,378,000	1,794,000
Coal year	322,270,000	440,695,000
Daily aver. coal year	1,334,000	1,816,000

ANTHRACITE

Dec. 31	862,000	1,641,000
Jan. 7 (b)	1,242,000	1,597,000
Jan. 14 (a)	1,643,000	1,895,000

COKE

	1922	1921
Jan. 7 (b)	108,000	
Jan. 14 (a)	118,000	266,000
Calendar year	226,000	537,000

(a) Subject to revision. (b) Revised from last report

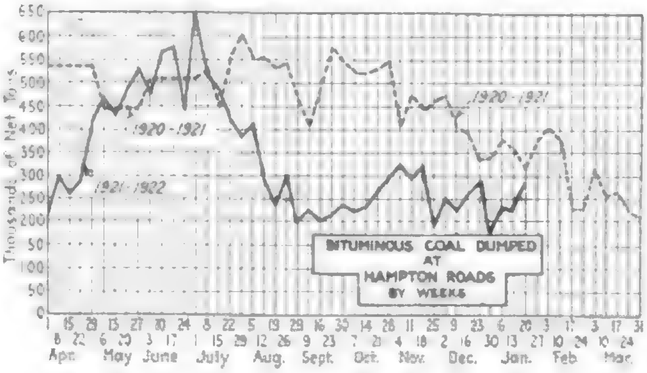
sumers' stocks were 25 per cent below the maximum recorded during the war. Since then production has been less than consumption and consumers have drawn on their stocks. At present production is barely equal to consumption.

Railroads are buying more freely. Last week the New York, New Haven & Hartford signed a contract for 500,000 tons, part Greensburg and part Fairmont. The prices are understood to be $1.80 and $1.85 respectively. Most roads are in the spot market, however, as the contract situation is too uncertain.

The principal domestic market—the Middle West—has been stimulated by lower temperatures and the liquidation of retail stocks presages a better movement from the mines. This has been anticipated somewhat by a flood of low-priced Eastern coal. As a result, southern Illinois producers have been forced to put quotations down a peg.

The all-rail movement to New England increased slightly during the week ended Jan. 14. There were 2,233 cars forwarded, as compared with 1,953 the week preceding. Railroad demands were lower and although central Pennsylvania coal is striving hard to compete it is confined to limits well removed from the Tidewater zone, an area that now covers much more than one half of the whole New England section. Large reserves are still characteristic of this territory and this precludes much additional buying action as the result of any strike possibilities.

Hampton Roads shippers are in better shape and there is less disposition to force coal on coastwise customers, but sales are made on an exceedingly close basis. Total dumpings during the week ended Jan. 19 were 266,638 net tons, as compared with 236,113 tons for the previous week.



The Lamberts Point Coal Exchange in operation at the N. & W. Piers at Lamberts Point for eighteen months, will cease to function Feb. 15, according to notices which have been forwarded to its members. The withdrawal of

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Dec. 26 1921	Jan. 9 1922	Jan. 16 1922	Jan. 23 1922†
Pocahontas lump	Columbus	$3.55	$3.40	$3.45	*$3.25@$3.35*
Pocahontas mine run	Columbus	2.15	2.15	2.15	2.00@ 2.25
Pocahontas screenings	Columbus	1.65	1.50	1.50	1.40@ 1.65
Pocahontas lump	Chicago	3.10	3.10	3.10	*2.50@ 3.25*
Pocahontas mine run	Chicago	2.40	2.50	2.50	*1.85@ 2.50*
Pocahontas lump	Cincinnati	3.25	3.00	3.00	*2.75@ 3.00*
Pocahontas mine run	Cincinnati	2.10	1.90	1.90	1.85@ 2.00
Pocahontas screenings	Cincinnati	1.65	1.25	1.30	**1.25@ 1.50**
*Smokeless mine run	Boston	4.55	4.70	4.80	*4.65@ 4.75*
Clearfield mine run	Boston	2.05	2.05	2.05	*1.65@ 2.25*
Cambria mine run	Boston	2.50	2.50	2.45	2.20@ 2.70
Somerset mine run	Boston	1.80	1.80	1.80	1.60@ 2.00
Pool 1 (Navy Standard)	New York	3.05	3.15	3.00	**2.85@ 3.50**
Pool 1 (Navy Standard)	Philadelphia	3.00	3.00	3.00	2.75@ 3.25
Pool 1 (Navy Standard)	Baltimore	2.35	2.50	2.30	**2.40**
Pool 9 (Super. Low Vol.)	New York	2.30	2.15	2.25	2.15@ 2.40
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	2.30	2.30	2.10@ 2.50
Pool 9 (Super. Low Vol.)	Baltimore	2.20	2.10	2.15	*2.10*
Pool 10 (H. Gr. Low Vol.)	New York	2.00	1.90	1.95	**1.90@ 2.25**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.00	2.00	2.00	1.90@ 2.10
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.00	1.75	1.90	**1.95**
Pool 11 (Low Vol.)	New York	1.75	1.70	1.70	1.65@ 1.80
Pool 11 (Low Vol.)	Philadelphia	1.70	1.70	1.70	1.60@ 1.80
Pool 11 (Low Vol.)	Baltimore	1.85	1.75	1.80	*1.70*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.50	1.50	1.45	1.35@ 1.50
Pool 54-64 (Gas and St.)	Philadelphia	1.55	1.55	1.55	*1.40@ 1.60*
Pool 54-64 (Gas and St.)	Baltimore	1.40	1.40	1.40	1.40
Pittsburgh Sc'd. gas	Pittsburgh	2.65	2.65	2.65	2.60@ 2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@ 2.20
Pittsburgh slack (Gas)	Pittsburgh	1.65	1.80	1.80	*1.70@ 1.80*
Kanawha lump	Columbus	2.85	2.80	2.95	*2.50@ 2.75*
Kanawha mine run	Columbus	1.90	1.75	1.80	*1.50@ 1.85*
Kanawha screenings	Columbus	1.15	1.25	1.50	*1.10@ 1.25*
Kanawha lump	Cincinnati	2.90	2.40	2.50	2.25@ 2.75
Kanawha mine run	Cincinnati	1.30	1.30	1.40	1.15@ 1.65
Kanawha screenings	Cincinnati	1.15	1.25	1.00	**1.00@ 1.15**
Hocking lump	Columbus	3.05	2.85	2.85	*2.50@ 2.75*
Hocking mine run	Columbus	1.95	1.75	1.85	**1.75@ 2.00**

	Market Quoted	Dec. 26 1921	Jan. 9 1922	Jan. 16 1922	Jan. 23 1922†
Hocking screenings	Columbus	$1.20	$1.45	$1.50	*$1.15@$1.25*
Pitts. No. 8 lump	Cleveland	3.00	2.85	3.50	*2.75@ 3.25*
Pitts. No. 8 mine run	Cleveland	1.95	2.00	2.10	*1.85@ 1.95*
Pitts. No. 8 screenings	Cleveland	1.70	1.90	1.95	*1.65@ 1.70*
Midwest					
Franklin, Ill. lump	Chicago	3.65	3.80	3.50	**3.25@ 4.00**
Franklin, Ill. mine run	Chicago	2.90	2.90	2.80	*2.25@ 2.50*
Franklin, Ill. screenings	Chicago	2.10	2.00	2.00	**1.85@ 2.25**
Central, Ill. lump	Chicago	3.10	3.10	3.10	*2.75@ 3.25*
Central, Ill. mine run	Chicago	2.50	2.50	2.50	*2.25@ 2.50*
Central, Ill. screenings	Chicago	2.00	1.80	1.80	*1.65@ 1.80*
Ind. 4th Vein lump	Chicago	3.35	3.35	3.35	*3.00@ 3.50*
Ind. 4th Vein mine run	Chicago	2.70	2.55	2.55	2.40@ 2.65
Ind. 4th Vein screenings	Chicago	1.75	2.10	2.10	*1.75@ 2.00*
Ind. 5th Vein lump	Chicago	2.95	2.95	2.95	2.60@ 3.25
Ind. 5th Vein mine run	Chicago	2.45	2.25	2.25	*2.00@ 2.40*
Ind. 5th Vein screenings	Chicago	1.80	1.65	1.65	1.50@ 1.85
Standard lump	St. Louis	2.80	2.60	2.75	2.50@ 3.00
Standard mine run	St. Louis	1.90	1.85	1.90	**1.85@ 2.00**
Standard screenings	St. Louis	1.40	1.45	1.35	1.25@ 1.50
West. Ky. lump	Louisville	2.75	2.85	2.75	*2.10@ 2.75*
West. Ky. mine run	Louisville	1.75	1.90	1.75	**1.80@ 2.00**
West Ky. screenings	Louisville	1.85	1.25	1.25	*0.75@ 1.35*
South and Southwest					
Big Seam lump	Birmingham	3.65	3.35	2.75	2.50@ 3.00
Big Seam mine run	Birmingham	2.10	2.10	2.10	1.90@ 2.30
Big Seam (washed)	Birmingham	2.15	2.15	2.15	2.00@ 2.30
S. E. Ky. lump	Louisville	2.85	3.10	2.85	*2.65@ 2.75*
S. E. Ky. mine run	Louisville	1.50	1.65	1.55	1.50@ 1.65
S. E. Ky. screenings	Louisville	1.45	1.35	1.25	1.25
S. E. Ky. lump	Cincinnati	3.15	2.85	2.55	**2.50@ 2.75**
S. E. Ky. mine run	Cincinnati	1.30	1.40	1.35	**1.25@ 1.60**
S. E. Ky. screenings	Cincinnati	1.25	1.25	1.10	*1.00@ 1.10*
Kansas lump	Kansas City	5.00	5.00	5.00	*4.50@ 5.00*
Kansas mine run	Kansas City	4.10	4.10	4.10	*4.00*
Kansas screenings	Kansas City	2.50	2.50	2.50	*2.50*

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in heavy type, declines in *italics*

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Jan. 9, 1922		Jan. 16, 1922		Jan. 23, 1922†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$6.75@$7.50	7.75@ 7.85	$6.75@$7.50	7.75@ 7.85	$6.75@ 7.50	7.75@ 7.85
Egg	New York	2.61	7.25@ 7.50	7.60@ 7.75	7.00@ 7.35	7.60@ 7.75	**7.00@ 7.75**	7.60@ 7.75
Egg	Philadelphia	2.66	7.00@ 7.75	7.75	7.00@ 7.75	7.75	7.00@ 7.75	7.75
Egg	Chicago	5.63	7.40*	6.95*	7.40*	6.95*	7.40*	6.95*
Stove	New York	2.61	7.85@ 8.25	7.90@ 8.10	7.85@ 8.10	7.90@ 8.10	*7.50@ 8.10*	7.90@ 8.10
Stove	Philadelphia	2.66	8.10@ 8.35	8.05@ 8.25	8.00@ 8.15	8.05@ 8.25	*7.75@ 8.15*	8.05@ 8.25
Stove	Chicago	5.63	7.60*	7.20*	7.60*	7.20*	7.60*	7.20*
Chestnut	New York	2.61	7.85@ 8.25	7.90@ 8.10	7.85@ 8.00	7.90@ 8.10	*7.50@ 8.10*	7.90@ 8.10
Chestnut	Philadelphia	2.66	8.10@ 8.35	8.05@ 8.25	8.00@ 8.15	8.05@ 8.25	*7.75@ 8.15*	8.05@ 8.25
Chestnut	Chicago	5.63	7.60*	7.20*	7.60*	7.20*	7.60*	7.20*
Pea	New York	2.47	4.25@ 5.00	6.05@ 6.45	4.25@ 4.75	6.05@ 6.45	**4.75@ 5.50**	6.05@ 6.45
Pea	Philadelphia	2.38	4.50@ 5.00	6.15@ 6.25	4.50@ 5.00	6.15@ 6.25	4.50@ 5.00	6.15@ 6.25
Pea	Chicago	5.63	6.10*	5.60*	6.10*	5.60*	6.10*	5.60*
Buckwheat No. 1	New York	2.47	2.50@ 3.00	3.50	2.25@ 3.00	3.50	**2.75@ 3.25**	3.50
Buckwheat No. 1	Philadelphia	2.38	2.25@ 2.75	3.50	2.25@ 2.75	3.50	**2.25@ 3.00**	3.50
Rice	New York	2.47	1.75@ 2.25	2.50	1.90@ 2.25	2.50	**2.00@ 2.25**	2.50
Rice	Philadelphia	2.38	1.75@ 2.00	2.50	1.75@ 2.00	2.50	1.75@ 2.00	2.50
Barley	New York	2.47	1.35@ 1.50	1.50	1.35@ 1.60	1.50	*1.35@ 1.60*	1.50
Barley	Philadelphia	2.38	1.00@ 1.25	1.50	1.00@ 1.25	1.50	1.00@ 1.25	1.50
Birdseye	New York	2.47	....	2.50	....	2.50	....	2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type, declines in *italics*.

a large number of members from the exchange makes its further operation economically unwise, the notice points out. This exchange was organized by the N. & W. Ry. when the old Tidewater Coal Exchange went out of business.

After Feb. 15 coal over the Norfolk and Western will be consigned to the individual shippers, and no other change will be effective in the management of the coal business there. At the same time there is pending in the Circuit Court of Norfolk a petition from twenty-one coal shippers in the Lamberts Point exchange to restrain the N. & W. from collecting upward of $500,000 in demurrage charges against them until the Interstate Commerce Commission has ascertained if the railroad's tariffs have been properly applied. The bill embodying this request was filed before the commission several weeks ago.

ANTHRACITE

Production of hard coal jumped to 1,643,000 net tons during the week ended Jan. 14, an increase of 400,000 tons over the preceding week. The output is still below the corresponding week of 1921, due to the hand-to-mouth buying which prevails. Many dealers are seemingly acting on the plan to reduce their stockpiles, knowing that there will be plenty of coal available to carry them through the period of wage readjustments.

COKE

Beehive coke production was 118,000 net tons during the week ended Jan. 14, an increase of 10,000 from the previous week's figure. The heavier output exerted a depressing effect on the spot market.

Production of beehive and byproduct coke in December was 2,374,000 net tons, little more than one-half of the monthly average in 1920.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES
(In Net Tons)

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,587,000	3,682,000
1920 Monthly average	2,569,000	1,709,000	4,278,000
September, 1921	1,423,000	289,000	1,712,000
October 1921	1,734,000	416,000	2,150,000
November, 1921	1,766,000	477,000	2,243,000
December, 1921	1,860,000	514,000	2,374,000

(a) Excludes screenings and breeze.

The quantity of coal required to manufacture the coke produced is estimated at 3,483,000 tons, of which 2,672,000 tons were consumed in byproduct ovens and 811,000 tons—less than a fourth—in beehive ovens. The coke industry is thus consuming coal at a rate 2,866,000 tons a month less than prevailed in 1920.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE
(In Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly average	2,625,000	4,354,000	6,979,000
1918 Monthly average	3,072,000	4,014,000	7,086,000
1919 Monthly average	2,988,000	2,478,000	5,466,000
1920 Monthly average	3,684,000	2,665,000	6,349,000
September, 1921	2,044,000(a)	456,000 (a)	2,500,000
October, 1921	2,491,000 (a)	656,000 (a)	3,147,000
November, 1921	2,538,000 (a)	752,000 (a)	3,290,000
December, 1921	2,672,000 (a)	811,000 (a)	3,483,000

(a) Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in byproduct ovens, and 63.4 per cent in beehive ovens.

Editor's Note.—*Coal Age* index of spot prices of bituminous coal, regularly appearing on this page during the past year, will be resumed next week. It has been considered advisable to recalculate the figures on the pre-war base instead of the "government price" base, that we have been using. Figures for 1913 to date will be published next week and thereafter the index will be published weekly.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

Germany—Production of coal in the Ruhr region during the week ended Jan. 7 was 1,543,000 metric tons, according to a cable to *Coal Age*.

Italy—Cardiff steam first is unchanged on the Genoa market at 37s. 6d., according to a cable to *Coal Age*. American coal is not listed.

India—The market continues dull. A sufficient supply of railway wagons has been arranged from the coal field area. Jheria first is scarce, railway companies having secured the available supply. English coal is unchanged.

Sweden—The peat inspector proposes that activity should be resumed at the peat mills belonging to the State Railways. It is pointed out that 4,500,000 kronen would be saved for the railways in this way owing to the decrease which would be effected in the imports of coal.

Spain — Mining is improving in a slight extent. Strikes in northern Spain have been abandoned by the miners involved without securing the concessions desired. Increasing cost of living and falling wages have aggravated industrial unrest.

A royal decree announces that from Jan. 1, for a period of three months, which may be extended by another three months, a bonus of 5 pesetas per ton will be granted on coal of Spanish origin shipped from Asturian ports to other Spanish ports.

Brazil—Coal imports at Rio de Janeiro during October, 1921, amounted to 40,374 metric tons, as compared with 117,362 tons during the corresponding month of the preceding year, according to *Commerce Reports*.

Total imports for the first ten months of 1919, 1920, and 1921 are given below:

Coal	1919 Metric Tons	1920 Metric Tons	1921 Metric Tons
English	102,337	161,201	121,965
American	528,250	558,786	425,902
Belgian	1,000	......	......
French	......	......	880
African	......	......	36
Total	631,587	719,987	548,782

Belgium — The market is becoming firmer. Industrial recovery is having a favorable influence on the industrial section of the market. Household coals are also in better position.

The non-ratification by the Belgian Government of the coke convention has led the Syndicate des Cokes to abolish the special price granted since Dec. 1 to iron and steel works in the country. As from Jan. 1 this price has been raised from 95 to 102 fr.

Greece — English fuels are now underselling American coals, c.i.f. Piraeus. It is believed, however, that America can meet the local market price, as the cost of mining and transporting is gradually reduced. The annual requirements for navy and army transports, state railways, municipal works, trampower works, and individual needs are about 250,000@300,000 tons. Recent orders indicate that the navy and army transports require about 240,000 tons annually, but the present orders are abnormal because of the war in Asia Minor. A list of the importers of coal in Greece may be obtained from the Bureau of Foreign and Domestic Commerce, or its district and co-operative offices, by referring to file No. NE-5024.

Export Clearances, Week Ended, Jan. 19, 1922

FROM HAMPTON ROADS:

	Tons
For Africa:	
Braz. S.S. Guaratuba, for Para	3,007
Du. S.S. Dardanus, for Port Said	1,787
For Atlantic Islands:	
Nor. S.S. Hellas, for San Domingo	818
For Brazil:	
Br. S.S. Whately Hall, for Buenos Aires	4,960
For Cuba:	
Am. Schr. Snetind, for Cianfuegos	3,192
Am. S.S. Carvallis, for Guantanamo	3,248
For Italy:	
Br. S.S. Cardiff Hall, for Porto Ferrajo	6,132
Br. Schr. Bessie A. White, for St. Johns	951
Am. Schr. Gladys M. Taylor, for St. George	1,388

FROM PHILADELPHIA:

For Ecuador:	
Nor. S.S. Granfos, for Guayaquil	890

Hampton Roads Pier Situation

	Week Ended Jan. 12	Week Ended Jan. 19
N. & W. Piers, Lamberts Point:		
Cars on hand	1,277	1,498
Tons on hand	67,645	86,814
Tons dumped	86,525	122,469
Tonnage waiting	7,450	4,450
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	781	830
Tons on hand	42,950	49,300
Tons dumped	89,822	73,771
Tonnage waiting	6,326	4,150
C. & O. Piers, Newport News:		
Cars on hand	605	824
Tons on hand	30,250	41,200
Tons dumped	34,469	41,830
Tonnage waiting	7,320	7,500

British Secure Heavy French Contract

Production in Great Britain was 3,675,000 gross tons during the week ended Jan. 7, 1922, according to a cable to *Coal Age*. As compared with the preceding week this is a gain of 600,000 tons. Production, however, failed to recover from the holiday slump as rapidly as was the case in either of the last two years.

Exports are steadily increasing, as shown in the following table. Prices are well held.

BRITISH COAL EXPORTS
(In Thousands of Gross Tons)

	1913	1920	1921
November	5,913	1,361	3,594
December	6,229	2,302	4,309
Cal. year	73,400	24,932	24,661

The Indian Government has placed an order on the Cardiff market for the supply of 100,000 tons of steam coal.

Glasgow has received an order to supply 300,000 tons of coal to the French railroads over three years. This is one of the largest contracts undertaken in Britain. The contract is to supply English and Welsh coal only. Other markets continue to inquire for future deliveries.

The industry still shows signs of recovery; more miners are finding employment and longer hours are being worked in the majority of districts. Scotland and the north of England have effected the most rapid recoveries, though in the former areas the effects of the damage to pits is still a factor.

Wages continue to fall as the appended table indicates:

BRITISH MINE WAGES

District	Percentage on Base Rates December	January
Scotland	136.44	132.75
Durham	119.73	92.87
Eastern area	109.54	109.[illegible]
Northumberland	107.35	85.76
Lancashire and Cheshire	72.76	72.35
Forest of Dean	64.33	62.00
Somerset		
Radstock	57.58	57.61
Newbury	22.00	22.00
North Wales	44.50	48.30
South Staffordshire	33.92	32.00
South Wales	28.03	28.00

Bunkers Increase at Hampton Roads

Business showed a slight increase last week on the side of bunkers and New England shipments, but foreign cargoes were scarce and of small proportions. Prices remained the same with very little to offer on the spot.

Accumulations at Tidewater increased somewhat during the week, with the re-opening of mines in the Southern fields. Freight rates were unchanged, both coastwise and foreign. A steady increase in general shipping put a better tone in the bunker market, and an appreciable increase in dumpings at all piers was noted.

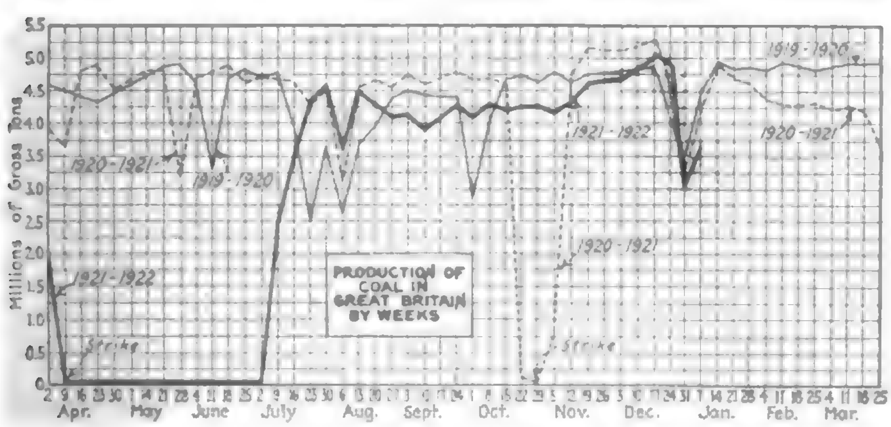
Dealers were more optimistic than at any time since November, and prospects of steadily better business during the coming months were believed to be in sight. The bunker business, particularly, shows much promise of increasing steadily in volume. New England markets are holding their own, which is regarded by coal men here as a favorable indication of better business.

December Exports Touch Low Point

December exports of bituminous coal fell to the unprecedented low point of 770,092 tons. In December, 1920, coal exports totaled 2,682,715 tons. The exports to Canada fell from 1,332,258 tons in December, 1920, to 621,993 tons in December, 1921. Imports of British coal during December totaled 17,031 tons. The detailed figures, which are those of the Bureau of Foreign and Domestic Commerce, are as follows:

DECEMBER EXPORTS AND IMPORTS
(Gross Tons)

	December 1920	December 1921
Exports: bituminous coal		
By rail to		
Canada	1,332,258	621,993
Mexico	46,261	6,637
Total	1,378,519	628,630
By vessel to		
West Indies	33,529	17,567
Panama	18,478	9,678
Cuba	69,919	53,262
Total	121,926	80,507
Argentina	119,763	22,384
Brazil	50,396	12,492
Chile	112,102	1,067
Uruguay	4,537	.....
Total South America	286,798	35,943
France	217,497	.....
Italy	189,346	.....
Netherlands	102,986	.....
Sweden	54,637	.....
Switzerland	27,949	.....
Total Europe	592,415	.....
Egypt	......	11,631
Other Countries	303,057	13,381
Total bituminous	2,682,715	770,092
Total anthracite	372,441	306,277
Total coke	77,109	23,034
IMPORTS		
Anthracite	337	192
Bituminous	103,944	87,506
Imported from:		
United Kingdom	150	17,031
Canada	93,784	66,520
Japan	.....	600
Australia	9,701	2,614
Other countries	309	741
Coke	2,195	3,165



Pier and Bunker Prices, Gross Tons

Foreign Bunker Quotations by Cable to Coal Age

PIERS

	Jan. 14	Jan. 21†
Pool 9 New York	$5.45@$5.60	**$5.46@ $5.65**
Pool 10, New York	5.20@ 5.30	5.20@ 5.30
Pool 9, Philadelphia	5.50	5.50
Pool 10, Philadelphia	5.10@ 5.30	5.10@ 5.30
Pool 71, Philadelphia	5.50@ 5.60	5.50@ 5.60
Pool 1, Hamp. Rds.	4.70@ 4.90	*4.65@ 4.80*
Pools 5-6-7 Hamp. Rds	4.30	*4.25*
Pool 2, Hamp. Rds.	4.50@ 4.60	*4.45*
BUNKERS		
Pool 9, New York	5.75@ 5.90	**5.[illegible]@ 5.95**
Pool 10, New York	5.50@ 5.60	5.50@ 5.60
Pool 9, Philadelphia	5.60@ 5.85	5.60@ 5.85
Pool 10, Philadelphia	5.40@ 5.50	5.40@ 5.50
Pool 1, Hamp. Rds.	4.80@ 5.10	*4.80@ 4.90*
Pool 2, Hamp. Rds.	4.60@ 4.75	*4.60*
Welsh, Gibraltar	40s. f.o.b.	*38s.* f.o.b.
Welsh, Rio de Janeiro	65s. f.o.b.	*55s.* f.o.b.
Welsh, Lisbon	45s. f.o.b.	*40s.* f.o.b.
Welsh, La Plata	62s. 6d. f.o.b.	*50s.* f.o.b.
Welsh, Marseilles	125 fr. f.o.b.	*120 fr.* f.o.b.
Welsh, Genoa	40s. t.i.b.	40s. t.i.b.
Welsh, Madeira	42s. 6d. f.a.s.	*40s.* f.a.s.
Welsh, Teneriffe	42s. 6d. f.a.s.	*40s.* f.a.s.
Welsh, Malta	45s. f.o.b.	*40s.* f.o.b.
Welsh, Las Palmas	42s. 6d. f.a.s.	*40s.* f.a.s.
Port Said	51s. 6d. f.o.b.	*49s.* f.o.b.
Belgian, Antwerp	32s. 6d.	*30s.*
Alexandria	46s.	46s.
Bombay	38 rupees	38 rupees
Capetown	42s. 6d.	*40s.*

Current Quotations British Coal f.o.b. Port, Gross Tons

Cardiff:	Jan. 14	Jan. 21†
Admiralty, Large	24s. 9d.	*24s6d.@ 25s.*
Steam, Smalls	18s. 6d.	*18s.@ 18s.6d.*
Newcastle:	23s. 9d.	**24s.**
Best Steams		
Best Gas	21s. 6d.	*20s. 6d.@ 21s. 6d.*
Best Bunkers	20s. 9d.	20s. 6d.@ 21s.

† Advance over previous week shown in heavy type declines in italics.

British Competition Not Insuperable

Much of the coal exported from the United Kingdom, especially the Cardiff fields, is now sold below f.o.b. costs, and it is highly improbable that the British can long continue to sell their export coal at present prices, says the Fuel Division of the Department of Commerce, basing its statement on evidence produced from British sources.

American exporters have a fair chance of getting a considerable share of the international coal business, particularly if all the factors entering the American coal industry will get together on an efficient business basis.

Largely because of the non-profit prices of the British, their coal exports for the months of August, October and November increased 32 per cent over corresponding months of 1920. Shipments of British coal have actually been made to the West Indies, a market held exclusively by the United States for twenty years.

The c.i.f. costs of British coal at West Italian ports are from 65c. to $2.35 lower than the c.i.f. costs of United States coal; at Rio the British c.i.f. costs are from 21c. higher to 52c. lower than for United States coal.

British mine wages are now at rock-bottom, since they are now at the minimum fixed by the agreement of 1921. Wages have since March, 1921, been reduced on an average of about 46 per cent. American wages are still at war-time levels. British railway coal freight rates have been cut approximately 12½ per cent. American railway charges are still at the peak point. British dock charges were reduced 25 per cent on Nov. 1, 1921. Combining these reductions with the recent cuts in railway charges, the total reduction in the cost of delivering coal from the mines f.o.b. ship averages about one shilling per ton.

Reports From the Market Centers

New England

BOSTON

Market Continues Without Change—Small Tonnages Being Absorbed—Restricted Outlet for Pennsylvania Grades—Anthracite Demand Very Light.

Bituminous—The larger buyers show very little interest in the current market and there are as yet no signs of any better demand. In this respect there is no change from early in the month, although among small steam-users there is a certain amount of buying. As yet there seems no reaction here to newspaper reports of strike possibilities, but this is only natural in view of large reserves that are still characteristic of this territory. Railroad traffic shows no improvement over December and in no direction do we learn of any better situation in the industries upon which the railroads depend.

At re-handling points like Boston and Providence prices on Pocahontas and New River for Inland delivery have again eased off, even for small lots. There are a few factors who are still asking $6.25 from scattered buyers, but one agency has named $6.05 as open figure on cars Boston, and cargo quantities have been disposed of at considerably less.

At the Hampton Roads piers there is a narrower margin between receipts and dumpings, and there is less of the tendency to force coal on reluctant buyers. Prices f.o.b. vessel for high grades have fluctuated from $4.60@$4.85, but a close price today would be $4.65@$4.70. The spot market is in that much better shape.

At this end, too, there is a certain tonnage being steadily absorbed. Orders for a few cars each that would ordinarily go to all-rail shippers are being filled by shippers here who are regularly distributing smokeless coals sent here in large cargoes at minimum rates. There is something like old-time competition between the different interests for every effort is made to inform buyers as to current costs, both f.o.b. mines and of transportation.

Attempts are made to re-open operations in central Pennsylvania that have been shut down for several months, but in this territory there is little encouragement for such efforts. Both run of mine and slack from the Pocahontas and New River districts cost so much less under present conditions at most Inland manufacturing centers that $1.50@$1.75 per net ton at the mines on medium grades is no inducement. For outlet in New England these coals will have to rely upon buyers well removed from the Tidewater zone, an area that now covers considerably more than half this whole section.

Vessel freights have not softened to the extent that was anticipated. Even the largest schooners that are casting about for orders draw the line at about 85c. to Boston, and barges are held at a range 15c.@25c. higher, depending upon size and draft. The recent gales along the coast have had their effect and it is generally recognized that at present rates there is no real profit in transporting coal.

Anthracite—Retail distributors report better business this month than in December, but this improvement in demand has not yet reached the wholesale trade. Tonnages thus far have been extremely light, but there is hope for better things in February.

The trade is rather counting upon enough newspaper discussion of labor differences to create an extra demand that the weather of itself would not justify. The season has been remarkably free from storms, but the average temperature has been low enough to make an impression upon household supplies. The independents are offering all sizes freely, although it is on egg and pea that they make their most attractive quotations.

Tidewater—East

NEW YORK

Domestic Coals Move Slowly—Steam Sizes More Active—Bituminous Situation Brighter—Consumers Watching Union Convention.

Anthracite—From the viewpoint of the retail dealer the situation shows some improvement, but this cannot be said of the wholesale end. The increased demand has not yet been reflected in wholesale offices but the prospects are considered better.

Retailers have been drawing heavily upon their reserve stocks the past few weeks and it is expected they will desire to have a good supply on hand April 1, in view of a possible suspension of mining. An obstacle in the way of increased buying is the matter of lower freight rates.

Demand has been controlled by weather conditions and a sudden change to lower temperatures has resulted in a steady flow of small orders. Peddlers report a thriving business during the stormy period of last week. However, nothing short of continued cold weather will put the industry on a steady basis.

The trade watched the outcome of the Shamokin convention and many expect a suspension of mining at the expiration of the present working agreement.

Movement in none of the domestic coals is active. Egg is in better demand than stove, although quotations are below company circular. Demand for all four sizes is better along the line than at this Tidewater.

The local docks are well stocked with domestic coals and because of the slow demand some of them are being operated on a three-day-a-week basis.

The steam coals are in better condition. With the increased demand and the cut in shipments due to curtailed mining, the distressed coal here has been cleaned up. The strongest demand is for barley, the better grades of which are being quoted about 10c. more than company circular.

Bituminous—Expectations of a tie-up on April 1 did not cause any undue flurry in this market. However, as soon as some consumers have considered the outlook they may enter the market and refill their bins.

With the situation remaining unsettled there has not been much accomplished with regard to the closing of contracts. Certain offices have made quotations, subject to readjustment if accepted, based on wage conditions. Other houses are reported to have made contracts so far as tonnages go, the price to be agreed upon as soon as the miners and producers settle their differences. The majority of consumers and buyers are deferring their contract negotiations, however, until the new wage agreement is reached.

Large tonnages of Southern coals were reported as arriving here during the week with quotations around $5.75 alongside, if the vessel could be accommodated at the pier. The export situation does not show any change and is not expected to do so now that the railroads have refused to cut freight rates on coal for export.

There were some rapid changes in price asking during the early part of the week, quotations depending entirely upon the tonnage available to the shipper. Some Pool 10 distress coal was quoted early in the week from 10c. to 15c. lower than the regular market quotations.

PHILADELPHIA

Anthracite Moves With Weather—Dealers Let Stocks Run Down—Steam Sizes Fairly Active—Bituminous Changes Little—Inquiries Increase—Prices Grow Firmer.

Anthracite—Retail trade responds to the thermometer. Yards have done heavy business on Mondays following cold Saturdays and Sundays, but purchases are small. This is partly because so many dealers have reduced prices that the consumer actually fears he will suffer loss should he take more than he needs at the moment. Strike talk so far has made very little impress upon buyers.

Many dealers seem to have no fear of a strike as the number of yards with big gaps in their stock piles is increasing. A small minority takes the stand that keeping a full yard is a good business move. These men expect to go into the spring with enough coal for the following two months.

The demand now is for stove and nut, in almost equal proportion, with the trade ordering in small quantities. The companies producing the best grades seem recently to have been able to make full time, but there have been suspensions with some operators of from two to three days a week.

Steam sizes continue to hold the improvement as shown last week, and with some shippers gains are reported. Buckwheat seems to be in good demand and even rice is somewhat active, and barley is moving nicely.

Bituminous—Strike news emanating from Washington has had a little effect on the buyers, causing a number of inquiries for prices and the possibility of prompt shipment. There is no indication that strike talk will start a rush for coal. Many consumers think the Government will prevent a suspension.

Buyers continue to expect lower

freight rates. All buying recently has been for current use, with one exception. The utility plants have lately been in the market for more coal, and quite a number of them now have stock on hand for from sixty to ninety days.

The industrial situation is difficult to analyze. The basic industry—iron—seems to have improved slightly in this territory, but textiles have received a decided check.

Spot prices remain low but firm. High-grade coals have the call and there is really light demand for low-volatile fuels under Pool 10. The non-union mines in central Pennsylvania in particular seem to be getting prices a little closer to the other operations, as the demand on them has been fairly strong recently.

BALTIMORE

Considerable Discouragement in Soft Coal Lines—Demand and Prices Very Flat — Retailers Not Reordering Anthracite.

Bituminous—The trade is considerably disappointed at the failure of promises that came with the new year for an early improvement in business. Line business is extremely dull and at prices below actual cost of production in many cases. Export business has stopped almost completely, there being not a single shipment other than one to Porto Rico since Jan. 1. The bunker trade is unusually slow.

The reason for the flat state of affairs as far as bunkers are concerned covers a wide range, but one element has to do with the fact that quite a large number of ships flying foreign flags are now bunkering on the other side for the round trip. This comes on top of the fact that recently several ships arrived at American ports from England with coal in ballast, which could be sold here at a price lower than the American rate on best coals at Tide.

On line business it is true there has been some stimulation from certain lines of industry entering the market for limited supplies, but the general situation is still far from healthy. Bunker coals took a new slide the past week, following their recent recovery to some extent, but did not get down to the point at which they were sold several weeks ago on Shipping Board contracts, which set the low for a number of months past.

Pools 9 and 71 were obtainable as low as $4.80 a gross ton at the piers before loading and trimming. Line prices too were none too healthy and individual need of selling rather than need of buying was the principal factor in setting the price on these transactions. Best steam coals, outside of Pool 1 which is not so largely on the market, as it has been pretty well covered on contract, are offering $2@$2.25 a net ton f.o.b. mines. The majority of sales are around $2.10@$2.15. There is little market for the poorer grades in steam coals. Best gas lump is also on the market at $2@$2.15 with run of mine at $1.85@$2. West Virginia gas run of mine is offering at $1.40@$1.65.

Anthracite — While conditions are nearer normal for the season than are those relating to soft coal, the situation is by no means satisfactory. Not only does ordering continue slow, but collections are bad. This makes it hard for some of the dealers to order ahead on a cash payment basis themselves.

The result is that the yard supplies of some of the smaller dealers are much below normal. There is on hand, however, sufficient to meet any emergency of a moderate nature.

BUFFALO

No Change In Bituminous Situation—Even Consumers Without Much Coal Refuse To Buy—Anthracite Decidedly Quiet.

Bituminous—The demand does not improve. There is a pretty steady trade of small volume in existence and that is all that shippers are looking for right away. Since about the middle of September, 1920, when the big bulge in the trade began to pass, there has never been any sort of revival of the bituminous market. Every change in prices was a decline. It is so yet, though the bottom has now been so completely reached that prices have been steady of late.

The weakness of the market is shown still by the reports of coal offering at specially low prices, where shippers appear to have failed to sell the coal before sending it out.

Nothing very encouraging as to the fixing of wages has developed of late. All miners will stand out for present pay as long as there is any prospect of getting it and they will be still more tenacious in regard to the check-off, where the real contest promises to arise. Operators believe they have the winning side and they will be entirely supported by jobbers.

Bituminous prices continue at $2.75 for Youghiogheny gas lump, $2.50 for Pittsburgh No. 8 steam lump, $2.25 for Allegheny Valley and other mine run and $1.50@$1.75 for slack, adding $2.36 to Allegheny Valley and $2.51 to other coals for freight.

Anthracite—The market is dull. Consumers do not buy if they can avoid it and nobody is stocking. Retailers are much puzzled to find even people with plenty of means buying a single ton at a time. This means an unnecessary expense to the seller and more or less waste, but the consumer cannot be convinced that coal is not going to be cheaper soon.

Independent anthracite is moving at a slow rate. The mine prices are nominally about a dollar over the schedule prices.

Coke.—The trade is quite as dull as coal. The furnaces are running at such a low rate that they do not need to buy much outside of the regular supply. Quotations remain at $4.15 for 72-hr. Connellsville foundry, $3.15 for 48-hr. furnace and $2.75 for stock, adding $3.64 for freight to Buffalo.

Northwest

MILWAUKEE

Business a Little More Satisfactory—Pocahontas Reduced $1—No Change in Other Grades—Stocks Heavy.

With the exception of a cut of $1 per ton in Pocahontas, all prices hold firm. The railroads report a steady falling off in the coal business out of Milwaukee, but local markets are more active. More coal seems to be going direct from the mines to the Northwestern country by rail than formerly. Dock stocks of anthracite and soft coal are still heavy.

Stocks have not been cut into to any great extent as yet, in fact it will take a strong pull of winter weather to clear the yards for another season. Perhaps this will be an advantage in spring, should there be a check in the coal movement at that time due to strikes at the mines.

So much coal with an excess of moisture content is being delivered in Milwaukee that an ordinance is being drafted for submission to the Common Council fixing a definite percentage of moisture that will be allowed here. Some coal tested by the City Sealer contains 17 per cent moisture.

Following are the retail prices compared with those which prevailed at this time last year:

ANTHRACITE

	Jan., 1921	Jan., 1922
Egg	$15.95	$15.70
Stove	16.20	16.10
Nut	16.20	15.95
Pea	14.35	14.10
Buckwheat	12.65	11.50
	$1 for carrying	75c for carrying

BITUMINOUS

	Jan., 1921	Jan., 1922
Pitts., Hock., and Yough., screened	$10.75	$7.75
Pile run	10.25	7.25
Screenings	9.00	6.75
West Virginia screened	11.00	8.00
Pile run	10.50	7.50
Screenings	9.00	7.00
Pocahontas screened	16.25	11.50
Mine run	12.50	7.75
Screenings	11.00	7.25
Smithing	13.00	8.00
Kanawha gas mine run	10.00	7.50
Ill. and Ind. screened	10.00	8.00
Pile run	9.50	7.50
Screenings	9.00	7.00
*Coke	17.25	15.00
	$1 for carrying	75c. for carrying

*No carrying charge on coke.

DULUTH

Screenings Prices Strengthen a Little—Anthracite Is Firm—Some Docks Are Fairly Busy While Others Are Idle.

Strengthening prices in screenings characterize the Duluth market this week, but demand as a rule remains poor in the outlying districts. In the city dealers report that coal sales to retailers are improving.

The advance in screenings has not been general throughout all docks, but several are quoting at $4.25, while others are firm at $4. Anthracite remains unchanged.

The distribution of trade is spotty throughout the docks here according to working time of dock employees. One dock is shipping every day of the week and the managers claim that all coal will be off before the opening of navigation. On others the men are only working three days a week or less.

The increase in local retail trade is looked upon as a good omen by dealers, who say that the outlying districts will follow the city and will order coal soon. The pickup in the city has been most noticeable in the last week, due to the fact that many have exhausted small stocks of surplus supply held in the home from summer purchases.

MINNEAPOLIS

Even Cold Snaps Fail to Revive Market—Soft Coal Rebounds 50c.—Docks Still Have Half Their Receipts on Hand.

All signs fail in dry weather,—likewise in dull business periods. The effect of a little winter weather has been negligible on the trade. During the past fortnight prices on soft coal have slumped $1 a ton and then with one company they rebounded 50c. The rebound is difficult to explain. The revised prices which add 50c. to the low figures give the following: Hocking, Youghiogheny or Splint stove or nut, f.o.b. dock, $6.50, run of pile, $6; Hazard stove or lump, $7.50, run of pile, $7; Elkhorn stove or lump, $8, run of pile, $7.50; Pocahontas egg and lump, $9. The last was not advanced. Screenings, $5.25.

The situation is that the turn of the year finds the docks with more than 50 per cent of both hard and soft coal receipts of the season still on hand. There was a little over 5,000,000 tons of soft coal on the docks Jan. 1 and nearly 800,000 tons of hard coal. No matter how good a demand may set in, these stocks will not be anywhere near exhausted by April 1.

It is unlikely that they will be reduced more than 10 per cent during January and February and possibly something less than half that for March —possibly 15 per cent reduction for the three months of January, February and March. So far as soft coal is concerned, this is subject to material revision if conditions industrially should change. But hard coal seems unlikely to show much deviation.

This means an immense stock carried over into the new season, which will doubtless come into competition with new coal mined under cheaper costs. The competition will probably not be developed until some time into the late spring or summer. For it is accepted as about certain that there will be a prolonged suspension of mining during the period that the new scale is being worked out.

One thing which may soon start people to buy is the growing feeling that it will be some time before any real reduction in freight rates may be expected.

Inland West

CLEVELAND

Strike Threat Beginning to Affect Market — Slack Is Weaker — Receipts Increase.

The warning of Secretary Hoover that a coal strike was imminent has had the effect of arousing consumers in this district to the true situation which confronts them. As a result inquiries are beginning to appear and operators believe that these are forerunners of a substantial buying movement which will be well under way by the first of the month.

Purchasing agents of industrial companies are on the anxious seat. They want to obtain the benefit of reduced railroad rates generally expected to be in effect by April 1, and on the other hand, if the strike appears certain, prices are bound to rise. Too prolonged delay will mean that they may be deprived of supplies.

As a result, the developments in the labor situation in the very near future will tell whether or not consumers are to throw price considerations to the winds and seek to cover their requirements.

Operators are predicting a rise in prices by April. Not only are prices expected to advance, but it is pointed out that the assurance of a strike will mean that little coal will find its way from the mines to consumers' stock piles after March 15. The railroads will see to that. Following their usual tactics the roads will provide first for their own needs in the case of a strike and for a week or so before April 1 they will hold practically all the fuel they get.

In view of these considerations farseeing buyers are moving now to cover their requirements. Slack prices have been softening in the last few days and latest quotations were around $1.75 a ton. Industrial stagnation continues but signs are accumulating that improvement in activities will appear shortly in such important industries as iron and steel. Motor and tire companies in this district have already begun to operate on a better basis.

Receipts of bituminous coal for industrial consumers and retail yards took quite a spurt during the week ended Jan. 14. The number of cars received for industrials was 1,087, retailers 370, total 1,457, an increase of 641 cars over the preceding week.

CINCINNATI

Prices Hold Up Fairly Well, Though Some Brokers Sell Low—Further Drop Expected.

While prices have held evenly there are signs of a further drop. The bituminous run of mine market price was $1.25@$1.50, yet there has been a lot of coal passing through brokers' hands a great deal below this figure. This, of course, is coal that is feeling the pinch that follows when the market fails to absorb readily. When it clutters the channel sufficiently it is bound to cause another break.

About the only bright spot in the market has been a little strengthening of the domestic lines. West Virginia and southeastern Kentucky lump and block that sold off to $2.25 at this time last week has revived and some of the latter operators are asking $2.75 for shipments. This seems traceable to the clean-up of old stocks throughout the selling district.

Smokeless coal is generally weaker, due perhaps to the close margin between consumption and production. The smokeless slack market is none too keen. The price asked is $1.25@$1.50 but there have been quantities sold for less.

The retail situation was given another jolt last week. Those who had failed to follow the cut made by one company with a dozen or more branches slit the price on bituminous lump to ribbons, though an effort was still being made to hold up the smokeless line. The range for the week was: Smokeless lump, $8@$9; run of mine, $7@$7.25; slack, $6@$6.25; bituminous lump, $6.50@$7; run of mine, $6; slack, $4@$5.

COLUMBUS

Better Steam Demand Develope — Domestic Trade Is Still Quiet—Production Increasing Slightly.

A better steam demand has developed in the past week. Orders are coming mostly from the large consumers and show that reserve stocks are being depleted and that there is a need for replenishment. Public utilities are buying fairly well and some buying on the part of public institutions is reported. Iron and steel plants are taking a larger tonnage. Prices have not been strengthened materially.

The domestic trade is rather quiet, following some increased activity due to lower temperatures. Warmer weather followed and the slight buying spurt subsided. Retail stocks are not as large as formerly as dealers have been cleaning up to a certain extent.

Retail orders are generally small as householders are buying from hand to mouth. Prices are practically unchanged.

Production has not increased materially during the past few weeks. In the Hocking Valley the output is estimated at 18 to 20 per cent and in the Pomeroy Bend field only slightly higher. The output in Crooksville and Cambridge is reported around 17 per cent.

INDIANAPOLIS

Wide Reductions at Retail — Market Continues Sluggish.

Price reductions, ranging 25c.@$1.50 a ton, have been announced by Indianapolis coal dealers. The largest single reduction was announced on Pocahontas shoveled lump. The new price is $8.50, a decrease of $1.50 as compared with the price of ten days ago.

The general reason given was that retail coal prices follow the trend of general market conditions as governed by supply and demand. There has been an average drop of 50c. in coal prices since the first of the year, some dealers said.

The wide difference in the extent of reductions on various coals were said by some to be due to variable wage scales paid to miners in union and non-union fields. This difference in wages amounts to $1 a ton difference in price to the consumer on the union and non-union coal, one dealer said.

Another ascribed variations in prices on Pocahontas among dealers to the fact that some laid in large stocks last summer at the mine price of $5.50, whereas it is now selling at the mines for $3. The determination of these dealers to avoid a loss on the stocks that they bought prompts them to keep the price at a high figure.

CHICAGO

Steam Market Weak—Domestic Aided by Cold Weather—Eastern Coals Soften Prices—Outlook Better.

The market is still poor as the demand for steam coals has not increased, while so far as domestic coals are concerned, there has been, it is true, a little improvement but merely on account of the weather.

The middle of last week saw the first real cold spell that the city has enjoyed for the past two winters. This weather is at least going to give retailers a chance to make some little dent in the huge piles of surplus coal they have around their yards. The general public has but little coal on hand and this cold weather will make a decided impression on supplies.

Rumors that prices on Franklin County coal, in some cases, have been cut became more prevalent this week and we understand that a number of large wholesalers were buying furnace size as low as $3. This has not been substantiated as yet, but it has been found very generally, that where there is smoke there is fire. Evidently some of the operators of southern Illinois have grown tired of seeing their trade taken away from them right under their noses and by Eastern competitors.

The East continues to flood Chicago with cheap smokeless coals. Distress sales have been very frequent and prices have gone as low as at any time during the last six months. Some Kentucky block had to be sold at a sacrifice last week. The demand for anthracite is no better or no worse than it has been during the past three weeks. Those who are buying it are only taking their immediate needs.

The coal men are a little more optimistic than they were a short time back, not because they see signs of renewed industrial activity, but because they realize certain economic changes have taken place in the business structure of this country which will be very beneficial in the long run. As an example of this they point to the fact that money is very much easier than it has been in a long time, and wages are being deflated fast.

ST. LOUIS

Cheaper Grades of Domestic Move Better—A Little Call for Storage in Steam—Market Generally Quiet, Although Cold Weather Prevails.

The few days of brisk winter weather helped move small lots of Standard and Mt. Olive. The local steam situation has shown some activity in small orders for storage coal. Very little Carterville is moving for steam or domestic. Anthracite is unusually quiet and coke shows some little activity.

Country domestic is good in spots, but steam call is far below what was expected after the first of the year and little, if any, activity is shown in storing.

Some coal is moving through to the Northwest via Omaha, and a fairly good shipment of Standard steam coal has moved to the Chicago market.

DETROIT

Bituminous Buying Continues Light—Receipts Are Not Large — Anthracite Market Quiet.

Bituminous — Consumers are not showing a great deal of interest in offerings. There is not much buying in either branch of the market, and the situation generally is described as being about as sluggish as at any time during the closing weeks of last year.

The feeling seems to be extending that very little change is to be expected in the condition of the Detroit market for some months to come. There is likely to be little improvement in buying demand for either steam or domestic coal until after the general business situation has made considerable further progress toward normal.

In the opinion of the trade, the general improvement in business, now under way, will continue slowly, with the probability that by midsummer, there will have developed a demand for transportation facilities that will produce something of a car shortage. Steam coal buyers will then be unable to pick up bargain lots and will be forced to a realization of the necessity of entering arrangements that will assure continuity of their fuel supply.

Consumers of steam coal, during recent months, have become so accustomed to making their purchases on a hand-to-mouth basis, that they have come to believe they can at any time, buy sufficient spot coal to provide for the reduced requirements of their plants.

Smokeless lump and egg is quoted $3 @$3.25, mine run at $2.15, nut and slack at $1.25. Ohio 3-in. lump is $3, 1¼-in. lump $2.75, egg $2.25, mine run $1.90, nut and slack $1.60. West Virginia 4-in. lump is $2.60@$2.75, 2-in. lump, $2.25, egg $2, mine run $1.65, nut and slack $1.25. Pittsburgh No. 8 district 1¼-in. is $2.35, ¾-in., $2.25, mine run, $2, nut and slack, $1.65.

Anthracite — While extremely cold weather has slightly stimulated demand, the buying falls much short of normal, due to unemployment and unusual economy in consumption.

South

LOUISVILLE

Mine Quotations Weaker — Retailers Cut Prices To Reduce Stocks.

Prices at the mines are slightly weaker and screenings are in somewhat better supply. Operators do not expect much business soon and would not accept contract business if it appeared.

In some circles it is believed that if union miners strike non-union fields will be busy, and men there will be happy to stay on the job.

With no semblance of winter weather in Louisville the retailer with large stocks cut prices a dollar a ton Jan. 17 on all prepared coals, and reduced also on steam. There has been no shortage of gas, which is being burned for fuel at the present low rate.

Coal that sold in early December at $8@$8.25 is now $6.50@$7. Mine run ranges $5.25@$6.50 and screenings $4 @$4.25, delivered by the retailer.

Some of the stock on retailers yards cost $3.50@$3.75 and $2 for freight, making cost on yard $5.50@$5.75 without including carrying charges or overhead. Of course some stock cost only $2.75@$3. However, delivery costs are around 75c.@$1, and the retailers will do well to break even.

Southwest

KANSAS CITY

Retail Business Picks Up—Steam Coal Outlook Is Better — Howat Followers Still Out.

Winter weather continued throughout the week. This stimulated retail deliveries and demand is about normal for the first time this season.

Some apprehension is felt over the outcome of negotiations for a new wage contract and it is expected that the demand will increase from now on till the old wage contract expires. Railroads will begin very soon to store coal. Far-sighted customers and especially steam plants will begin storing coal early before the demand becomes too heavy and forces the price up.

The situation in the Kansas field is unchanged. Operators cannot take the strikers back because they are not members of the union and that organization is either slow in reinstating the strikers and giving them card memberships or the strikers are loath to apply for membership and thereby repudiate Howat.

Prices are as follows: North Missouri lump, $4.25; mine run, $3.50; washed slack, $3.25; raw slack, $2.50. Arkansas lump, $6; mine run, $3.75@$4.25; slack, $2.50. McAlester lump, $8.50; nut, $7; slack, $2.50. Central Illinois lump, $2.50; egg, $2.25; slack, $1.75@$2; Franklin County lump, $4.25; egg, $4.05. Ordinarily Franklin County has a moderate demand in this territory, but buying has been light this year, due to the general disposition on the part of the retail trade to buy the lowest priced coal.

West

SALT LAKE CITY

Retail Business More Active—Operating Conditions Unimproved.

Retailers are enjoying the best business they have experienced in many months. Things are still quiet in the operating field. Revised figures on last year's production show that only 4,000,000 tons were mined in the state, compared with 6,004,788 in 1920.

DENVER

Production at Low Ebb — More Wage Cuts Announced — Rockvale Mine Reopens.

Colorado suffered a decrease of 3,575,537 tons in its coal production in 1921 as compared with the 1920 tonnage. Intermittent cold spells have been insufficient to keep up anything like a full time output; in fact, production has been about 100,000 tons under the average weekly output for this time of year. Production for the week ended Jan. 7 was 121,000 tons—almost as low as that of the middle of last June.

Three additional independent bituminous companies have announced wage reductions corresponding with the 30 per cent cut inaugurated by the Colorado Fuel & Iron Co. They are the Juanita Coal & Coke Co. of Bowie; Sam Perry Coal Co., Florence, and the Ohio Creek Coal Co., Gunnison.

The Rockvale Mine of the C. F. & I. Co., where a sympathetic strike was staged during the recent trouble, has been reopened. Coal Creek, Emerald and Fremont mines were shut down at the same time, and will be reopened soon. In the meantime the crew of the Rockvale is being selected from all four camps.

Canada

TORONTO

Cold Weather Brings Improved Business — Receipts from Mines Show Decrease, but Good Supply on Hand—Prices Firm.

Demand for anthracite has been considerably improved by the setting in of cold and stormy weather and dealers are receiving good orders. Receipts from the mines show a considerable decrease due to the holidays, but enough is coming forward to keep the yards well stocked.

Bituminous is little called for and there appears no likelihood of any marked improvement in the demand in the near future. Quotations are unchanged from former levels.

News From the Coal Fields

Northern Appalachian

PITTSBURGH

Demand Remains Light, Though Sharp Competition Shaves Prices Down a Little — No Stocking Against a Strike Yet.

Demand for coal does not seem to be any heavier, and, judging by prices going, it is less than it was a few weeks ago. Possibly the sharper price competition is due to operators making a stronger effort to run. A price of $1.50 on mine run is now quite common in several open-shop districts, and is by no means the limit as there are occasional quotations of $1.25 or $1.20, though probably only on "distress" tonnage.

Production in the Pittsburgh district under union auspices is confined almost wholly to such gas coals as commands a relatively high price on account of its quality, and to domestic lump in which quality also is a factor, the difference in cost—f.o.b. mine—between union and open-shop coal being small by the time delivery is made in the buyer's cellar. Coal yards that can take water delivery are distributing river coal chiefly, obtained from various points on the Monongahela, the saving in freight making up for the extra cost of production on account of the union scale.

Operators assume that coal buyers generally expect a mining suspension April 1 at the union mines and that the reason they are not stocking coal at present against this prospect is that they think there is still plenty of time left.

The market is quotable approximately as follows: Steam slack, $1.30@$1.50; gas slack, $1.70@$1.80; steam mine run and ordinary gas, $2.10@$2.20; ¾-in., $2.60@$2.70; Panhandle 1¼-in. domestic, $2.75@$2.90 Pittsburgh district.

EASTERN OHIO

No Perceptible Change in Demand—Encouraging Signs of Industrial Activity — Production Trend Is Upward.

Production for the week ended Jan. 14 amounted to 329,000 tons or 52.6 per cent of potential capacity based on railroad ratings. As compared with output for the same week last year, when 346,000 tons were produced, the result is a decrease of 17,000 tons. Association mines worked about 44 per cent of full time, and are averaging around 50 per cent of capacity output.

There is no perceptible change in the sluggish demand except possibly that continued cold weather has brought a slight revival in inquiries from dealers. It was thought that some impetus might be given to Ohio production by the recent proclamation issued by Governor Davis urging that Ohioans buy Ohio coal.

While reports from industrial centers are somewhat encouraging some buyers unquestionably are hesitant to do any further stocking because of anticipated reductions in freight rates and miners wages.

The volume of freight traffic on the railroads is showing no increase through the larger terminals and, consequently, the carriers likewise are consuming a minimum amount of fuel as compared with more normal times.

Steel makers in the Mahoning Valley and Youngstown District are more hopeful than ever of the prospects for the new year although not expecting capacity business during 1922. Wire mills are averaging around 50 per cent while sheet makers are running from 60 to 70 per cent. This, along with other favorable factors pointing to a further lifting of the depression, give reasonable grounds to believe that the volume of mining operations in eastern Ohio will be gradually upward as the year advances.

ANTHRACITE

Better Operating Conditions — Steam Market Stronger—Independent Domestic Prices Soften.

A greater resumption of work marked the week ended Jan. 14. The majority of the companies are working full-time. Independent coals are more readily taken, but prices on domestic sizes have slipped back a peg. Steam grades are in good demand.

The strike at the Barnum Colliery of the Pennsylvania Coal Co., near Pittston, has been settled. Although search is still being conducted, the bodies of the miners who lost their lives in the National Mine disaster have not yet been recovered.

FAIRMONT AND PANHANDLE

Railroad Fuel Business Is About All There Is to Be Had—General Conditions Worse Than When Year Opened.

FAIRMONT

Production is still greatly curtailed. Mines are almost solely dependent upon light railroad fuel business. Most mines in the northern part of the state are still out of commission.

NORTHERN PANHANDLE

Except where mines have railroad fuel contracts operations are either greatly limited or else mines are closed. The average weekly production of about 50,000 tons, is taken mainly by railroads. Railroad fuel mines are working half time. Other mines are running one or two days a week if at all.

UPPER POTOMAC

Whole Region Awaits Making of New Wage Scale—90 Per Cent of Mines Stand Idle.

No improvement in the situation in this and the Georges Creek territories is expected before a new wage agreement is made. Fully 90 per cent of the mines are still idle. About the only mines in operation are those at which there has been a lowering of the wage scale. There is a possibility that companies and miners may make their own agreements without regard to the union.

CENTRAL PENNSYLVANIA

Prospects Good for Pick-Up in Business — Rough Weather Interferes — Prices Firm.

With the end of the second week of January, coal operators experienced better business and the prospects look good for a continual pick-up for the remainder of the month.

The prediction that the removal of the transportation tax would increase business pretty generally came true and there was increased buying. Weather conditions have been bad in the field for some time and this had the effect of decreasing output. With stocks depleted and a strike in prospect, buying is heavier now than for many months.

Car placement was interfered with for several days on account of the heavy snowfall throughout the entire region but this was soon overcome and worked but little hardship. Prices have shown no tendency to drop.

UNIONTOWN

Market Shows a Little Life — Future Orders Appear — Coke Is Almost Inactive.

The coal market is commencing to show a little life in expectation of the contracting period of April 1. The activity is not pronounced but when compared with the listless market tone prevalent for several months it becomes a decided improvement. That situation is reflected in quotations of coal offerings for delivery up to April 1.

While the spot market on byproduct is quotable at $1.50@$1.60 the price goes up $1.80@$1.85 where the consumer wants delivery running over the three months period. While the aggregate of such business is not large it is held to be significant as showing which way the wind is blowing. The market for steam coal of various grades is quotable at $1.35@$1.50 with the analysis not cutting such a figure in price as would be expected.

Coke requirements at present seem to be fairly well covered and the market may be termed almost inactive. Quotations, however, have not been affected and $2.75@$3 is the range for standard quality furnace coke. A ratio of $3.75 @$4 prevails for foundry coke with a 25 cent premium for box car loading.

CONNELLSVILLE

Market for Coke Softens Noticeably—Nobody Is Buying Much — Production Increases.

The recent stiffening in spot prices for both furnace and foundry coke is over. No new contract business has appeared.

Heavier production by the merchant ovens some time ago has been absorbed and stock coke is light now. The blast furnaces have been buying practically no spot coke for weeks past and miscellaneous demand is lighter than usual.

Standard furnace coke can be had for $2.75. Highest grade foundry coke remains quotable at $3.75. The market prices are: Spot furnace. $2.75@$2.90; contract furnace, $3.10@$3.20; spot foundry, $3.75@$4.25.

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended Jan. 14 at 56,100 tons by the furnace ovens, an increase of 8,980 tons, and 32 810 tons by the merchant ovens, a decrease of 1,200 tons, making a total of 88,980 tons, an increase of 7,780 tons.

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Middle Appalachian

HIGH-VOLATILE FIELDS

Kanawha Production Picks Up a Little —Prices Still Sag—No Demand Even Though Slack Is Running Short.

KANAWHA

Production is back on the December level. Market conditions remain much the same, with no spot demand except a little for slack. Lump was not over $2.75 and little moved. Mine run was $1.25@$1.75.

LOGAN AND THACKER

Logan mines with a lower wage scale regained during the first half of January some of the ground lost late in December and were producing at about 42,000 tons a day during the week ended Jan. 14. The bulk of this output, however, was divided between contract and commercial orders and railroads.

The output in the Thacker field is now about 30 per cent of capacity. It meets contracts and railroad fuel orders. The demand for domestic is light. Slack is getting scarce. Lump was not quoted at more than $2.75.

VIRGINIA

Conditions are little changed. Mines are producing about 50 per cent of normal capacity. Most of this goes to regular customers. Many plants are still shut down. Prices are: Lump $3@$3.25, egg, $2@$2.25, slack $1.25@$1.75.

NORTHEASTERN KENTUCKY

The early January slight spurt in production has subsided. A majority of mines in eastern Kentucky are closed. Demand for domestic coal is dead as ever. Prices are, slack, $1.25@$1.50; mine run, $1.50@$1.75; lump, $2.75@$3.

LOW-VOLATILE FIELDS

Production Picks Up — Shipments to Tidewater Slightly Larger—Little Coal Goes Westward.

NEW RIVER AND THE GULF

New River production picked up a little with lower wages even though there was no general change in the smokeless market. This increase was limited, however, to the first day or so of the second week in January. There was a fairly large movement to Tidewater. Prices are: Prepared, $3@$3.50; mine run, $2; slack, $1.25@$1.65.

Gulf production was approximately 35 per cent of potential capacity with many of the mines still down. There was a little better Tidewater movement than during December. Contract orders were about all that producers had and they only sufficed to keep mines going for one or two days. Prices on all grades continue low.

POCAHONTAS AND TUG RIVER

Pocahontas production has increased a little. For instance, on Jan. 9 over 2,000 cars of coal were loaded on the N. & W. Contract shipments were somewhat larger than usual and there was also a better movement to Tidewater. The market for prepared was dormant. Lump was $3@$3.75 and slack $1.25@$1.75.

Tug River production continues at the rate of about 65,000 tons a week because of the large tonnage sent to affiliated companies. There was little tonnage flowing eastward either to Tidewater or to Inland markets. Prices were about the same as in the Pocahontas region.

Middle West

WESTERN KENTUCKY

Some Private Wage Reductions—Union Scale Forces Inactivity or an Operating Loss.

The general situation is unchanged. Coal is being produced at cost or at a loss in some instances, although some operators have private wage agreements and are not paying the union scale. It is understood that this has been the case in some instances, where miners rather than be idle have agreed to accept less than the union scale to enable the mine to compete with sections that are not paying union wages.

For instance, it is reported that one gas and electric company, which has its own mines, has found that it could buy coal on the open market for less than it could produce it.

Until something is done to relieve the wage scale situation, and industrial demand picks up, the western Kentucky field is merely endeavoring to hold its markets.

MIDWEST REVIEW

Strike Talk Does Not Urge Industries to Stock Up — Some Operators Drop Prices Without Stimulating the Movement.

The newspapers in the Middle West are giving a great deal of space to the prospect of a mine strike in the spring. The average purchasing agent looks upon the strike talk as very clumsy propaganda, gotten up solely to stimulate sales. This attitude is so general and so pronounced that the volume of sales is far below the amount predicted last fall. During the early winter months, those who were in the habit of prognosticating the future for the coal industry, made frequent prophecies in regard to the good business Illinois and Indiana operators were going to enjoy from Jan. 1 until April 1. Unfortunately, these perdictions have not materialized, as business continues to lag in both the steam and domestic markets.

The week passed quietly, so far as the situation on domestic coals is concerned. Some of the Franklin County operators are reported to have cracked under the strain they have been subjected to for a long time, and made very substantial reductions on their prices, especially furnace and small egg. These reductions were not made to the retail trade by circular but were made rather to a few favored wholesalers from whom quick assistance could logically be expected. While these reductions stimulated sales a little, the results were not satisfactory and probably did more harm than good, so far as the general welfare of the trade is concerned.

Very little buying of steam coal took place last week. Practically no additional railroad coal has been sold outside of contract. Screenings are barely holding their own. Purchasing agents are not interested. Most of them do not know how long their factories are going to continue in operation.

Those in charge of the credit department of the large coal companies are leading a harassed life because, in the first place, collections are unusually slow and in the second place, credit risks have very greatly increased. Accounts which were perfectly good a year ago and less than a year ago, are now uncertain. A large number of coal companies have taken out credit insurance. The general complaint against credit insurance, however, is that the insurance companies are so strict and their requirements so numerous that it is almost impossible to find customers who are strong enough financially to satisfy the insurance people. It is safe to say, however, that the percentage of those in the coal business taking out credit insurance has increased nearly 80 per cent.

SOUTHERN ILLINOIS

Weather Increases Movement of Domestic Tonnage — Steam Shows Improvement—General Condition Bad—Railroads Begin to Store Coal.

In the Carterville field the seasonable weather in the past week has helped to move domestic sizes. The steam situation looks somewhat better. Some mines have had to crush coal to keep up their contract requirements.

The general situation is unsatisfactory. Several mines are idle, though railroads, who generally buy coal from this section are beginning to increase their tonnages.

The Association operators are still asking $4.05 for lump or egg, but the nut is going at about $3.50@$3.75. Screenings range $1.75@$2 or a trifle better. Independents are selling as low as $3@$3.25 for lump and egg, and $2.75 for nut. The mine run price generally is about $2.60@$2.75.

The situation and prices in the Duquoin and Jackson County fields are somewhat similar to those in Carterville. The Mt. Olive situation shows a little improvement in the movement of domestic sizes. The mines work about two days a week on domestic and five days on railroad tonnages.

The country price on domestic sizes is $3.75, St. Louis and Chicago $3, and Kansas City and adjacent territory $2.50 to meet competition from other fields.

The Standard situation continues much as it has been, with a surplus of everything.

Southern Appalachian

SOUTHEASTERN KENTUCKY

Cold Moves Coal a Little, but Buyers Are Chary — South Uses More Wood.

Cold weather has helped to reduce retail stocks and domestic demand again shows some signs of life, but buying continues on a hand-to-mouth basis and has not helped production to any appreciable extent. Reports are coming in from the South indicating that wood is being substituted for coal.

As to the steam trade, wholesalers are pessimistic. In most cases they agree that bookings are better than for December, but prices continue to weaken.

Best Harlan block is quoted $2.65@$2.75; mine run, $1.50@$1.65; screenings, $1.25.

News Items From Field and Trade

ALABAMA

An examination of applicants for certificates of competency to fill positions as first and second class mine foremen and fire bosses was held in the offices of Chief Mine Inspector C. H. Nesbitt, Birmingham, from Jan. 23 to 26. The state board, of which Mr. Nesbitt is chairman, holds these examinations each January and July.

Announcement is made of the appointment of **James L. Brierton** as vice-president and general manager of the Central Iron & Coal Co., in charge of Southern properties. **Robert B. Rust** has been made president of the corporation and **Robert A. Allison**, asistant general manager. Southern headquarters are at Halt, Tuscaloosa County, where furnaces and byproduct ovens are located, with coal mines at Kellerman and other points. Mr. Brierton has managed the Southern properties for a number of years.

The Braehead Coal Mining Co. has been organized at Blocton, Bibb County, and has leased 640 acres containing the Woodstock seam of coal in the Cahaba coal basin six miles from Blocton on the Mobile & Ohio. The mine is being equipped to produce 300 tons of coal daily. C. C. **Huckabee**, of Birmingham, is president of the new company.

ARKANSAS

Receivers have been named for the **Southern Anthracite Coal Co.**, of Russellville, in the United States Court for the Eastern District of Arkansas, on petition of the **McAlester Fuel Co.**, McAlester, Okla. E. W. Hogan, superintendent of the company's Russellville mines, and **John W. White**, of Russellville, were named receivers. The company is unable to meet its obligations and judgments recently taken against it, according to the petition.

ILLINOIS

Howard W. Showalter, of the Diamond Coal Co., Fairmont, was a visitor in Illinois markets during the latter part of January.

The mine at Farmesville, near Hillsboro, which was closed before the United States entered the war, is soon to be opened again. The property is owned by German interests who closed the mine during the war. A tract of 30,000 acres of land is owned in connection with the mine.

C. B. Kunneman of Nameoki has been named by Governor Len Small on the state industrial commission to succeed **L. F. Lumaghi**, president of the Lumaghi Coal Co., of Collinsville, who resigned because of press of business.

The North Breese Coal & Mining Co., has sold its mine at Breese to the **Breese-Trenton Mining Co.**, of St. Louis.

A judgment was given in the Federal Court, East St. Louis, against the **Illinois Fuel Co.**, of Sparta, of $12,900 in favor of the **Space Fuel Co.** of Minneapolis, for breach of contract. The evidence proved that when the market advanced the defendant failed to ship on the contract but sold the coal on the open market.

Thomas Henderson, well-known coal operator and mining man of southern Illinois, is spending the winter months at Vero, Fla.

INDIANA

As a result of the leasing of the **Chicago, Terre Haute & Southeastern Ry.** by the **Chicago, Milwaukee & St. Paul Ry.**, a market for an enormous tonnage annually is opened in Indiana coal fields. Credit is due the Division of Geology of the State Conservation Department which published many articles concerning the quality, quantity, value and distribution of the coal of Indiana, and which undoubtedly supplied the information whereby the St. Paul system was able to determine the value of Indiana's coal resources. This railroad system will use about 3,000,000 tons of coal a year in addition to the coal being supplied from the mines in other states intersected by their system.

The tipple at the Vandalia Coal Co.'s No. 23 Mine which was destroyed by fire four months ago, has been replaced with a new structure and operations have been resumed.

KENTUCKY

The North Jellico Coal Co., Wilton, has increased its capital from $175,000 to $525,000.

The Cherokee Coal Co., Louisville, capital $25,000, has been chartered by T. V. Borntraeger, John F. Herschey, and Louis V. Glogower.

The Hayden Smith Coal Co., Mercer, has changed its name to the **Hayden Coal Co.**

The Block Coal Co., and Martha Washington Coal Co., Evarts, have merged as the **Block Coal Co.**, and increased aggregate capital from $60,000 to $75,000.

W. C. Hartley, of the D. H. Brown Coal Co., of Knoxville, visited the mines in Harlan and Bell County recently.

Fred M. Sackett, of the Speed interests, operating the Byrne & Speed Coal Co., and numerous mining operations in the state, has been elected president of the Louisville Board of Trade, a position which he resigned in 1917, to take up war work.

The Parkland Ice & Coal Co., Louisville, has announced plans for erection of a plant to cost between $50,000 and $75,000, work to start at once.

The Duvin Coal Co., Inc., is about ready for operation. Incorporators are F. V. Ruckman and D. J. Ruckman, Providence. This is one of the larger mines in western Kentucky.

The Long Wall Mining Co., Pineville, has been chartered by Estill Gooch, James Gabbard and N. R. Patterson.

A coal mine over a coal mine, each operated by different companies, will be accomplished at Providence, a few miles south of Evansville. An Alabama company has leased 300 acres of land from the **Diamond Coal Co.** at that place and instead of sinking a shaft to reach the first vein of coal, will use gigantic steam shovels to strip off the surface. It is said that the stripping operation will not disturb that of the company, which owns the land and which is digging coal at a considerable depth under the surface.

MARYLAND

B. P. Maloney, one of the representative operators of the Upper Potomac field, in charge of the operations of the Davis Coal & Coke Co., at Thomas, spent a few days in Baltimore during the second week of January.

William A. Morgart, of Cumberland, has been made president of a $600,000 Maryland corporation, which he formed for the development of a new coal field in Garrett County. The tract consists of 35,000 acres upon which three mines of large capacity are being opened.

G. Marshall Gillette, of Frostburg, in charge of the Maryland division of the Consolidation Coal Co., was at Baltimore during the second week of January.

MISSOURI

The Bates Coal Mining & Mercantile Co. has opened a new coal mine on the Bellier place, north of Rich Hill and is now loading coal.

The Central Missouri Coal & Mining Co., recently organized at Jefferson City, is planning extensive improvements on the coal properties at Hibernia. New equipment will be purchased, including boilers, engines, conveyors, pumps and general mining machinery. A railroad line will also be installed at the mine. John McManus, secretary-treasurer, is in charge of the work.

Mine No. 1 of the **Home Coal Co.** has shut down on account of the condition of the coal market. One hundred and ten men were employed at the mine.

John C. Poepperling has severed his connection with the Sterling-Midland Coal Co., St. Louis, to engage in business for himself.

NEW YORK

Fred D. Gearhart, formerly with Cosgrove & Wynkoop Coal Co., of New York, and well known to the coal trade, has gone into business for himself with offices at No. 1 Broadway.

The Chelsea Coal Corporation has been formed to transact business in New York City. It has a capital of $10,000 and the incorporators are given as S. Naylor, G. B. Van Zee; and D. F. Gilchrist.

The Valley Camp Coal Co., of Cleveland, has opened a branch office in the Marine Trust Bldg., Buffalo, with Martin F. Murphy in charge. This is another move in the effort to place No. 8 coal in the Eastern market.

C. W. Watson, president of the Consolidation Coal Co., spent the Christmas holidays in New York.

The firm of **W. W. Battle & Co.** is now known as **W. W. Battle & Co., Inc.**, a New York corporation, in which William Whittingham Battle, Carlos C. Rodrigues and Joaquin P. Rodrigues are directors. The corporation will continue to carry on the business heretofore carried on by W. W. Battle & Co.

Effective Jan. 1, **J. Noble Snider** is appointed Coal Traffic Manager of the New York Central Railroad Co., (Line Buffalo, N. Y., Clearfield, Pa., and East) with office at Grand Central Terminal, New York, vice **G. N. Snider**, resigned.

Effective Jan. 1, **Alan McMichael** is appointed Coal Freight Agent of the New York Central Railroad Co., (Line Buffalo, N. Y., Clearfield, Pa., and East) with office at Grand Central Terminal, New York.

Brooks Fleming, Jr., of Fairmont, assistant to the president of the Consolidation Coal Co., was in New York on business connected with his company on Jan. 9 and 10.

Frank R. Lyon, vice-president of the Consolidation Coal Co., with headquarters at Fairmont, was in consultation with officials of his company at New York on Jan. 10.

John Markle, one of the Pennsylvania coal operators, who lives at the Hotel Plaza, New York, underwent an operation recently, that, it was believed, would restore the vision of his left eye. He has been blind in the right eye since 1307, while the sight in his left eye had been rapidly failing. Mr. Markle is recognized as one of the largest independent anthracite operators in Pennsylvania.

OHIO

Papers have been filed with the secretary of state increasing the authorized capital of the **Mt. Cherry Coal Co.**, from $600,000 to $900,000. The concern has large coal properties in the Hocking Valley.

George F. Carpenter, who was the president of the New York Export Coal Co. and formerly with the Matthew Addy Steamship Co., has opened an office in the Dixie Terminal Bldg., Cincinnati, where he will represent **Dexter & Carpenter**, of New York, as that company's Western sales manager.

The state will have in operation soon a new system of mine rescue work, which is expected to be more efficient than the old system. Trucks containing mine rescue equipment of all kinds, stationed at five central points in the mining regions have been purchased. Each of the trucks will have the same equipment as the mine rescue cars used on the railroads. On each truck will be six breathing machines and also six resuscitating machines. The truck stations will be at Pomeroy, Nelsonville, Cambridge, Bellaire and Amsterdam.

J. S. Jones, chairman of the board of trustees of the Sunday Creek Coal Co., left recently for a three weeks sojourn in Florida with his family.

The offices of the **Lakin-McDonald Coal Co.**, a Columbus jobbing concern has been moved from 16 East Broad St. to the Interurban Terminal Bldg.

Changes made in the Cincinnati coal trade with the first of the year were: **Walter L. Tetman** becomes field agent for the Chesapeake & Virginian Coal Co., with headquarters at Huntington; **Fred A. Walker**, a former retailer at Mt. Healthy, becomes office man for the Amherst Coal Co., **J. W. Astbury**, former manager of the Raleigh Smokeless Coal Co., Michigan representative for the Amherst Coal Co., **Sam McLaughlin** severs his connection with the Central Fuel Co., and **F. U. Fischer** goes with the Hager Coal Co.

E. J. Frechtling, Cincinnati sales agent for the Main Island Creek Coal Co., has announced the following incorporations: **E. J. Frechtling Coal Co.**, of Hamilton, capital $50,000. Guy Mitchell, Elmore J. Frechtling, Robert N. Shotts, Brandon R. Millikin and Millikin Shotts incorporators; **Frechtling-Mitchell Coal Co.**, capital $100,000, same incorporators, also of Hamilton.

A. L. Moses, who has been secretary of the Southeastern Coal Co. since it was formed has resigned to become the manager of the retail departmnt of the E. J. Frechtling Coal Co. in Cincinnati. This will be run as a branch of the Hamilton company that was recently formed.

Seeking dissolution of the **J. B. Hickory Cannel Coal Co., Jewett, Bigelow and Brooks, Detroit**, has filed suit in the Hamilton County Common Pleas Court at Cincinnati, in which it alleges that the stock, property and effects of the Hickory company have been reduced so far that it will not be able to pay all just demands for which it is liable. The Detroit company and its individual members own 148 shares of the 300 shares of stock issued while Okey Meadows and his wife of Cincinnati own 150 shares. Louis H. Stone and H. E. Chrisman, Cincinnati own the remaining two shares.

Homer L. North is now the Akron representative of the Wholesale Coal Co., Pittsburgh, succeeding **T. J. McNamara.**

E. H. Doyle, general manager of the Middle West Coal Co., with sales offices in Cincinnati, is spending a well-earned vacation in Arizona. Mrs. Doyle accompanied him on his trip.

William J. O'Toole, vice-president of the Central Pocahontas Coal Co., who was recently appointed Minister to Paraguay, expects to sail for South America about March 1. He recently paid a visit to the sales office in Cincinnati.

PENNSYLVANIA

The Thomas Colliery Co., of Shenandoah, has decided upon an immediate appeal to the Supreme Court against the decision of Judge Henry, of Lebanon County, who greatly limited its mining operations to save the surface and prevent the destruction of valuable property. The case is said to prove that there is possibility of suits in equity restraining mining operations which cause cave-ins, without recent legislation on the subject, as this case is brought under the general law and not under recent acts.

Plans are nearly completed for six additional batteries of byproduct coke ovens to be erected at the Clairton works of the **Carnegie Steel Co.** It is expected work will be commenced early this month. The new ovens will be built on the 1,800 x 5,200 ft. site on which the twelve batteries now in operation were erected in 1918 and 1919.

Two employees of a coal company recently disputed as to the manner in which certain work should be done. One of the men, trying to get away from the other, tripped in a doorway, fell, fractured his skull and died. The compensation board on the appeal of the **Huskin Coal Mining Co.** of Windber, decides that the company must pay compensation as Oravee was in the course of his employment.

It has been announced this week that **Maurice A. Conrad** has been appointed manager of the Pittsburg office of the F. A Fish Coal Co., Toronto. He succeeds the late E. F. Hartland.

Thruston Wright is president, and **John Gibson**, vice-president and general manager of the Penn Smokeless Coal Co., operating in Somerset County. They also comprise the Wright-Gibson Co., a coal sales agency. Their office is in the Union Bank Bldg., Pittsburgh.

F. A. Wyant, who recently resigned as resident engineer in charge of the construction of the new Warwick Mine of the Diamond Coal & Coke Co., has accepted the position of engineer for the Arrow Coal Mining Co., Pittsburgh.

High water on the Monongahela River recently floated away and destroyed the tipple of the **Albany Coal Co.**, below Brownsville. The tipple is being rebuilt.

The Warwick Coal Co., of Pittsburgh, has contracted with the Roberts & Schaefer Co. for the installation of a new steel river loading tipple near Martin.

The Keystone Coal & Coke Co. on Feb. 1 will take over the properties of the **Jamison Coal & Coke Co.**, in the Greensburg district. The purchase, involving about $8,000,000, was consummated recently.

VIRGINIA

John M. Franklin has been appointed manager of the Hampton Roads offices of the Cory Mann George Corporation, succeeding **A. C. Oden'hal.**

The Smokeless Coal Corporation, Pulaski, recently organized with a capital of $150,000, is planning for the installation of electrical and other operating equipment at its properties. The company has a tract of over 1,400 acres of land and will proceed with extensive development work at an early date.

WASHINGTON, D. C.

Argument is being heard by the Supreme Court in the case involving appeals of minority stockholders from the decree in the Reading coal dissolution case as entered by the U. S. District Court at Philadelphia. Among the last briefs to be received by the court in the case was one opposing the District Court's decree by Seward Prosser, Mortimer N. Buckner and John H. Mason, representing a committee of common stockholders. They noted seventeen exceptions to the decree of the lower court.

R. C. Moore, state geologist of Kansas, has been in Washington conferring with officials of the United States Geological Survey.

The Supreme Court has postponed argument of the **Coronado Coal Co.** case, in which the United Mine Workers seek to set aside a judgment in favor of the coal company for destruction of its property during a strike, from Feb. 27 to March 20, on motion of William A. Glasgow, Jr., one of the attorneys in the case.

E. F. Burchard has been granted a year's leave of absence by the Geological Survey, to undertake private work in oil geology in South America.

That a revived interest is being taken by the American Institute of Mining and Metallurgical Engineers in the Federated American Engineering Societies was indicated at the recent meeting in Washington of the executive board of Engineering Council. The matter of licensing of engineers was brought up at the request of the institute. A very spirited debate was occasioned. The proposal was laid on the table and the president was instructed to submit the matter to a special committee for consideration and report.

J. M. Hill, V. C. Heikes, C. W. Henderson and **C. N. Gerry**, of the Western offices of the United States Geological Survey, spent the week of Jan. 9 in the Washington office.

The Bureau of Mines has issued a report reviewing investigations in North Dakota as to the development of lignite as a high grade fuel, the report covering lignite carbonization and carbonized residue briquets.

O. E. Meinzer, of the staff of the Geological Survey, is making an extended Western trip.

WEST VIRGINIA

The Wilhelmina Collieries Co., at Williamson, has contracted for a Marcus screen and loading equipment to be installed in their tipple near Williamson.

A company recently organized to develop a tract of coal land in Clay County and whose plans for such development are progressing is the **Elksplint Coal Co.**, with headquarters at Elkhurst. This company has a capital stock of $75,000.

The West Virginia Coal & Coke Co., the general offices of which are at Elkins, has completed the installation of a large conveyor at one of the important mines in Randolph County.

W. H. Cunningham, of Huntington, spent a part of the second week of January at Washington where he attended a meeting of the West Virginia Association, of which he is secretary.

The Atwater interest in the **Fire Creek Smokeless Coal Co.** and the **Laurel Smokeless Coal Co.** operating on the Stone Coal Branch of the Virginian, has been acquired by the Kinsley Steamship Co. The secretary of the two companies, following the change in ownership is C. J. Spath, of New York. Mr. Kinsley, controlling the Pawama and Algonquin coal companies on the Norfolk & Western, will consolidate the operations of all four companies under one management.

George Wolfe, secretary of the Winding Gulf Operators' Association with headquarters at Beckley, who recently returned from a trip to Jacksonville, was at White Sulphur Springs, on Jan. 10, when the annual meeting of the association was held.

Frank B. Stewart is in Winifrede to direct the work that is being provided for the miners of the Winifrede Coal Co., of which he is the president. Mr. Stewart learned that units of the Red Cross were preparing to enter the Kanawha coal fields to do welfare work among the destitute miners there. He was struck with a plan to forestall such a move on his property and has offered all of the men who were willing to work at $2 a day employment in cleaning up the property and otherwise improving things on top.

Friends of **S. A. Scott**, vice-president and general manager of the New River Co., the largest operating concern in the New River field, are glad to learn that he is recovering from a successful operation and is convalescing rapidly at Atlantic City.

Edward Cooper, former member of Congress and head of the Mill Creek and other companies in the Pocahontas field, although offered the post of minister to Peru has declined the honor, feeling that he could not relinquish at present the management of the numerous properties in which he is interested in southern West Virginia.

The Norfolk & Western Ry. will build a new coaling plant at Williamson to cost about $75,000. Plans have been completed and the work will be commenced at an early date.

The Pemberton Coal & Coke Co., is planning for extensive operations at its properties at Affinity. The company has increased its capital from $300,000 to $700,000 for expansion. William A. Phillips is president.

Lee J. Sandridge of Philippi, in association with Pittsburgh people has organized the **Meriden Collieries Co.**, which will operate at Meriden in the Barbour County field on the line of the B. & O. Associated with Mr. Sandridge in this venture are: Clyde B. Johnson of Charleston; A. S. Davis, H. M. Feely and F. C. Masten of Pittsburgh.

ALBERTA

Alberta coal is coming into competition with the product of Vancouver Island and the Nicola-Princeton Fields. Evidence of this has been marked in recent weeks, in fact ever since a reduction in freight rates was announced. Operators believe that, if it can be shown that their fuel is as good for steaming purposes as that of the Island, it will be possible, by underselling, to obtain a grip upon the market now controlled by the collieries of the coast.

NOVA SCOTIA

Only actual miners will be included in the new schedule of wages and working conditions made by the **Dominion Coal Co.**, in Nova Scotia, with the United Mine Workers. It is stated that the company wishes to eliminate from the contract shopmen, railway sectionmen and others not concerned with actual mining operations, but who have been covered by previous United Mine Workers' schedules.

ONTARIO

Lyman Bovee, president of the Arcadia Coal Co., Pittsburg, was a recent caller on the Toronto coal trade.

According to a statement just issued by the assignee, assets of the **Nukol Co., Ltd.**, are $144,212, and liabilities $72,309. Preferred creditors and outstanding bondholders have claims amounting to $62,874. Claims of other creditors are $9,635.

A visitor to Toronto recently was **W. J. Bursick**, Ontario representative of Jewitt, Bigelow & Brooks, of Detroit.

G. B. Bauder of the Berwind Fuel Co., Cleveland, O. was a recent business visitor in Toronto.

The Trust & Guarantee Co. has issued a writ at Osgoode Hall, Toronto, against the **Port Stanley Nukol Co., Ltd.**, to enforce a mortgage of March 15, 1921, securing bonds or debentures to the amount of $200,000. The company also asks that they be appointed receivers.

B. M. Hamilton, of the Jefferson Coal Co., Pittsburg, was a business visitor in Toronto recently.

Traffic News

The commission has opened for further oral argument the case of the **American Smelting and Refining Co.**, in which the commission recently decided that demurrage charges and average free time at Baltimore on shipments of coke for export in 1918 were not unreasonable.

The Northwestern Pennsylvania Coal Operators' Assn. in a complaint alleges unreasonable rates on coal from mines on the Bessemer & Lake Erie and Western Allegheny roads to markets in New England on the Boston & Maine and New Haven roads because they exceeded rates from mines in the same district on the B. & O. and Pennsylvania roads to New England.

In the complaint of **Bell & Zoller Coal Co.** and others an examiner recommends that th rule of the B. & O. Southwestern and other roads governing the distribution of cars to mines for coal loading are unreasonable, and prescribes reasonable rules for the future.

In the **Refinite Company** complaint the railroads have filed exceptions of the examiners' recommendation that the commission eliminate the 1920 advance in rates on coal, pea, slack and screenings from Wyoming producing points to Ardmore, S. D. The railroads contend that the finding by the examiner for lower rates on smaller sizes of coal than on larger sizes is contrary to previous rulings.

In the complaint of the **Kellogg Toasted Corn Flake Co.**, involving rates on soft coal from Ohio fields and from the inner and outer crescent fields to Battle Creek, Mich., the Lansing Chamber of Commerce has been allowed to intervene.

The Barnett-Fischer Coal & Mining Co. has withdrawn its complaint involving rates on coal from Marion and Pittsburgh, Ill., and points in that vicinity, by reason of changes in reconsignment rules.

The Indiana Coal Trade Bureau and the Knox County Coal Operators' Association have been authorized to intervene in the complaint of the **Milwaukee Association of Commerce** involving rates on hard and soft coal from Duluth and Superior.

The I. C. C. has awarded reparation to the **Cotton Manufacturers Association**, of South Carolina on shipments of bituminous coal from Appalachia and Dante districts in Virginia to Union, S. C., on which the charges were paid prior to Dec. 31, 1915, at rates found unreasonable in investigation of this case.

The commission will hear at Salt Lake on Feb. 6 testimony as to the rates on coal from Wyoming mines to points in Utah. On Feb. 4 at Salt Lake the commission will hear the complaint of the **Premier Coal Co.**

The Independent Elevator Co., of Galloway, Minn., has complained against unreasonable rates on soft coal from Duluth to Detroit, Minn., diverted to Galloway.

The Monongahela Power & Ry. Co. has withdrawn its complaint relating to rates on soft coal from Baxter to Jayenne, W. Va., from June 25, 1918, to Feb. 4, 1919.

The Republic Coal Co., of Minneapolis, has complained against unreasonable rates on soft coal from West Frankfort, Ill., to La Crosse, Wis.

The Central Wisconsin Supply Co. has withdrawn its complaint regarding rates on bituminous coal from Hymera, Ind., to Milwaukee, reconsigned to La Crosse.

Examiner M. Witters of the I. C. C. heard the complainants in the person of the **Cincinnati Purchasing Agents' Association, the Cincinnati Waterworks**, and other utilities and their protest against the placing in effect of the L. & N. coal rate from the southeastern Kentucky fields to Cincinnati, Newport and Covington, (Ky.) at the Hotel Gibson in Cincinnati. When the increased freight rates were allowed there was a differential of 20c. a ton created in the favor of the Kentucky shippers as against those from West Virginia. A hearing was held and the rates of the L. & N. were allowed to be advanced. Later Cincinnati receivers awoke to the fact that they had allowed an opportunity to slip by and the hearing was allowed.

The I. C. C. has decided that the rates on coal from points in Idaho, Utah and Wyoming to Cottonwood and Nezperce, Idaho, are not unreasonable, but that one shipment of coal by the **Madison Lumber & Mill Co.**, from Storrs, Utah, to Nezperce was overcharged, for which reparation is awarded.

The Melcroft Coal Co., of Pittsburgh, in a complaint to the I. C. C. alleges discriminatory rates on coal from Melcroft to Eastern destinations as compared with rates from the Meyersdale and Clearfield regions by the absence of joint through rates.

In the complaint of the **Indiana Board & Filler Co.**, an I. C. C. examiner recommends that the rates on coal during Federal control from Indiana mines to points in that state involving a line haul of five miles or less which exceeded 50c. a ton were unreasonable.

The commission has denied the application of the **Omaha Chamber of Commerce** for reargument of the case in which the commission found that the reconsignment rules and charges on coal and coke in all cars effective Aug. 20, 1920, in territory west of the Mississippi River were not unreasonable.

In the complaint of **W. H. Warner & Co.** an I. C. C. examiner recommends that the rate on slack coal from Landon, Pa., to Rostraver and Monessen, Pa., is not unreasonable.

The Utah Supreme Court has denied the motion of the **Jeremy Fuel & Grain Co.** against the D. & R. G. Ry. to strike out a bill of exceptions in the action of the former to recover excess charges. The district court's decision was overruled.

The commission recently cancelled the hearing scheduled at New Orleans regarding rates and terminal charges on coal to Gulf Ports.

Obituary

The death took place in Toronto on New Year's day of **Ross Cotterill**, who for the past eight years has been the city salesman for the Elias Rogers Coal Co., Ltd. Deceased was widely known in the coal trade of Ontario and his death is generally regretted. He was thirty-eight years of age and leaves a wife and family.

James Y. Lockwood, secretary and treasurer of the Southern Coal, Coke & Mining Co. of St. Louis died at St. Luke's Hospital in that city on Feb. 9, after a few days' illness. He was 65 years old, was single and was a son of the founder of Webster Groves, Mo., a suburb of St. Louis, where he lived. The deceased was one of the pioneers in the coal business in St. Louis.

Association Activities

Cincinnati Coal Exchange

Hugh McVeagh was the speaker of the evening at the annual meeting and installation of officers of the exchange. Mr. McVeagh is the assistant general manager of the Big Four and told the hundred or more coal men who were present of the trials and tribulations of putting the railway's policy of fuel conservation into effect. He brought along samples of honeycomb, a new flue nuisance with which his road and others have to contend. James Reilly, president of the Chamber of Commerce and a former president of the coal exchange, Colonel Charles R. Moriarity and others spoke. Flowers were ordered sent to the hospital for Joseph Tuohy, a veteran office manager who is ill. The annual fees were voted to be maintained at $10 a year.

Winding Gulf Operators' Association

At the annual meeting of the association held at White Sulphur Springs, W. Va., Jan. 10, all the members of the old board of directors and all the old officers were re-elected, E. E. White of Glen White, being chosen as president for the twelfth consecutive time. Other officers elected were: W. Gaston Caperton of Slab Fork, vice-president; C. H. Mead of Beckley, treasurer, and George Wolfe, of Beckley, secretary.

The business session was followed by a luncheon, at which President White acted as toastmaster. Among the guests were J. G. Bradley, president of the National Coal Association; Judge Charles E. Dice and the Hon. Frank H. Anschutz, of Lewisburg; Robert Livermore, identified with the metal industry of Colorado and the Rev. Arthur B. Livermore.

In the course of his remarks, President Bradley of the National Coal Association said that the day of special isolation in any business was a thing of the past in the United States and through the closest co-operation only could the coal industry hope to survive. Addressing himself to the question of ever-increasing taxes, he said that it behooved operators to interest themselves in seeing that men were sent to the legislature who would consistently and intelligently attempt to solve the problems of taxation. High freight rates to Tidewater and the demoralization of American shipping through unfavorable laws were cited as causes for the loss of foreign business.

West Virginia Coal Association

At a specially called meeting of the executive committee of the association held in Washington on Jan. 9, it was decided to make further urgent representations for a reduction of $1 a ton in the freight rate on coal for export, this question pending before the Department of Commerce and the Interstate Commerce Commission. The text of the resolution adopted at the Washington meeting was as follows:

"The loss of the export trade on West Virginia coal is in a large measure due to the present high freight rate, though a reduction of $1 a ton in the export rate to Tidewater will enable West Virginia operators successfully to compete with foreign coals in foreign markets to the extent of a very large additional tonnage over what is now being hauled to Tidewater over the various West Virginia railroads."

The executive committee authorized and directed the officers of the Association to present the views of West Virginia operators to the presidents of the Tidewater railroads.

Tug River Coal Operators' Association

Th annual meeting of the association was held in Welch, W. Va., Jan. 18, with a large attendance of members.

The following executive committee was selected: A. B. Rawn, Huntington, A. F. Leckie, Welch, J. T. Wilson, Bluefield, H. H. Harman, Tazewell, Va., H. A. McCoy, Twin Branch, George Wolfe, Beckley, H. F. Warden, Bluefield, L. Epperly, Bluefield, C. H. Harman, Tazewell, Va.

The executive committee elected A. B. Rawn, president, A. F. Leckie, vice-president, C. C. Morfit, secretary, and John T. Wilson, treasurer.

A. B. Rawn was elected the association member of the executive committee of the West Virginia Coal Association and C. C. Morfit was named as alternate.

Consideration was given to House Bill 3721, recently introduced, which provides the establishment of a Government Fuel Yard at Washington. This bill is opposed on the ground that it is not proper for the Government to engage in general business and is simply a move on the part of some politicians that may result in the establishment of bureaus for coal, merchandise and what not all over the country.

Another matter was that of the Ohio rate case now pending before the I. C. C. This is an attempt on the part of southern Ohio operators to widen the differential on railroad rates on all coal going west. This is a vital question to the State as a whole, as it would mean an increase of approximately 35c. a ton on all coal going through and to Ohio and a loss of many millions of dollars annually to the business of West Virginia.

Coming Meetings

American Wood Preservers' Association is holding its annual meeting on Jan. 24, 25, and 26 at the Hotel Sherman, Chicago, Ill. Secretary, G. M. Hunt, Madison, Wis.

American Institute of Electrical Engineers will hold its midwinter convention in New York City, Feb. 15, 16 and 17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Institute of Mining and Metallurgical Engineers will meet on Feb. 20 to 23 in New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

Canadian Institute of Mining and Metallurgy will hold its annual meeting March 1, 2 and 3 at Ottawa, Canada. Secretary, G. C. Mackenzie, Drummond Building, Montreal, Quebec, Canada.

Southern Appalachian Coal Operators' Association will hold its next meeting Feb. 10, 1922, at Knoxville, Tenn. Secretary, J. E. McCoy, Knoxville, Tenn.

Pittsburgh Vein Operators' Association of Ohio will hold its annual meeting on Feb. 13, 1922, at Cleveland, Ohio; D. F. Hurd, secretary.

COAL AGE

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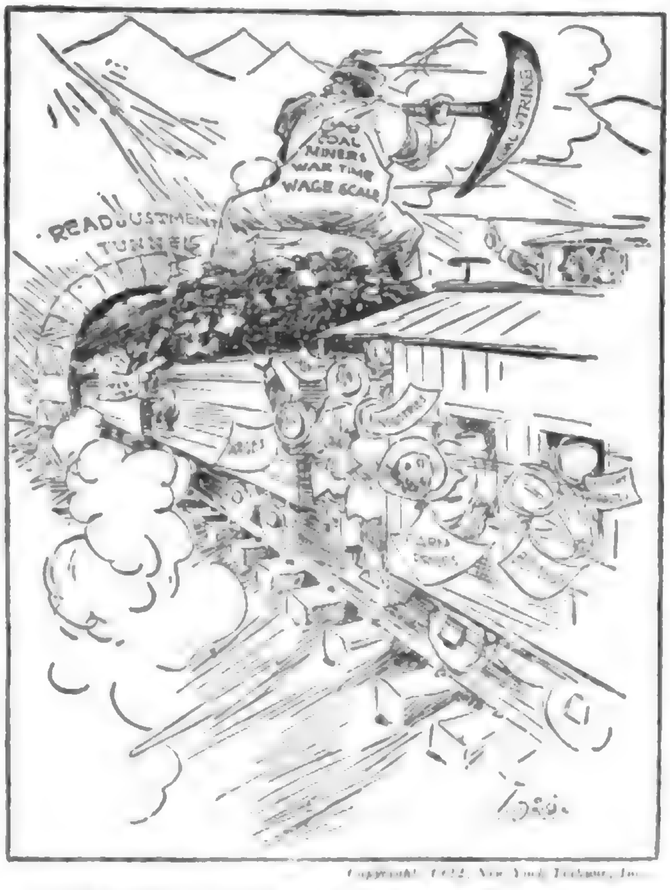
Senator Kenyon's Industrial Peace Plan

WHAT happens when an irresistible force meets an immovable body? Senator Kenyon in his report on the Mingo situation compares the desire of the United Mine Workers to organize the West Virginia fields and the opposition of the operators to such organization in the terms of the age-old quiz in high school physics. The scientist has never furnished an answer but Senator Kenyon has proposed one. It is a governmental body without judicial, executive or police power, able only to enlist public opinion. To such a body he would have the miners' union tell their story, presumably much as they told it to the Senator, and here also the operators would tell their story. And the public would settle it by deciding which is right.



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LOOKS LIKE A BAD TIME TO INSIST ON STANDING OUT ON TOP

The report is an able document. The case is fairly stated, the claims of both miners and operators are carefully set forth, the issue is defined with no dodging of the points in dispute, and the author courageously proposes a solution. He sets forth his views of industrial relations at length, backed up with a historical review that is concise and comprehensive, and concludes with an expression of hope that the Senators will study his document in preparation for consideration of a bill that he will later introduce on the subject.

We urge everyone to read the somewhat lengthy report of twenty-six printed pages (abstracted in this issue of *Coal Age*) for the light that it sheds on the author's ideas and beliefs on industrial relations. Neither side to the conflict in West Virginia will obtain the satisfaction from the report they might have desired, for he is unsparing in his condemnation of certain practices of each and equally considerate in recognizing the moral and legal rights of both.

On the whole we believe that the operators have the better of it. Their right to refuse employment to union miners because they would become agitators is not contested, but, on the other hand, the right of the union to attempt organization by peaceful means is recognized and stressed. It seems that the principal encroachment of rights by the operators has been in subsidizing deputy sheriffs who act as other than strict guardians of their private property. In other words, the operators are found to have stretched several points in their efforts to keep the union out of the field. He points to Logan County in particular in this regard.

On two main points the union is severely criticized. The Senator considers it "rather unfortunate" that the United Mine Workers changed their constitution to read that they demand "full social value of their product" instead of, as originally stated, "an equitable share of the value of their product." He says it cannot be disputed that the United Mine Workers have "done acts of violence in this Mingo controversy." The Senator says, however, that he is more concerned with remedies than with a review of past conditions and seeks some means of reconciling what he recognizes as diametrically opposing interests and at the same time giving recognition to the great third party at interest, the public.

Senator Kenyon frankly states his lack of faith in the Kansas Industrial Court because "it has no underlying code of rules or principles which are regulatory or mandatory upon the court." He thinks that this court is "based upon a violation of previous experience, both here and abroad, arising from legislation prohibiting strikes, and, further, it aims to solve a problem in human adjustments with an arbitrary, rigid and unrestricted judicial fiat." The tribunal he proposes differs in his opinion because having as a base a code of principles sanctioned by industrial usage and, he trusts, to be sanctioned by the Congress. He ventures the hope that, lacking the fundamental defects of the Kansas court, his plan would meet with "complete success and approval."

He proposes a replica of the present Railway Labor Board, three members representing labor, three the operators and three the public, all to be appointed by the President, the findings of the board to be published, and enforced by public opinion, no fines or penalties to be provided. In this proposal Senator Kenyon displays no originality. If he will turn to pages 34-38 of Dr. Garfield's personal report* to President Wilson on his direction of the Fuel Administration, he will find the same plan proposed; proposed too, we feel, out of wider experience and with more sympathy for all concerned and with no possible taint of political expediency.

There is perhaps one major point of difference between the Kenyon and the Garfield plans, although, until the Senator has told us more, of this we cannot be sure. Dr. Garfield would have a commission "to forestall controversies, to consider at any and all times conditions likely to disturb industrial relations, and in no sense to be regarded as a court or board of arbitration for the settlement of disputes."

We cannot but feel that problems of industrial relations are no more impossible of solution than the Irish question, but, like that famous controversy, now happily on the way to settlement, the road to peace is long and tiresome. We commend the Kenyon report for not taking the popular form of state control of coal, a direction which he might have been expected to go and for which there is already some evidence of popular demand.

A Phrase Turned Into Cash

"MORE business in government" was a happy presidential phrase. Its utterance awakened hopes and elicited some cheers. Then American business sat back critically and waited to be shown. The Department of Commerce has worked hard to meet expectations. In a year the business bureaus of the department —Bureaus of Standards, of Census, and of Foreign and Domestic Commerce—have answered a heterogeneous mass of 300,000 inquiries from business. They have made active contact with 127 trade associations and with 90 business committees representing 350,000 engineers, merchants and manufacturers who needed—and have been getting—the department's assistance.

Take the Bureau of Foreign and Domestic Commerce. Today committees representing 60,000 business men are steadily collecting information for the bureau and getting definite aid worth much cold cash. An automotive division has organized a company under the Webb-Pomerene Act to open the foreign market for American machines. The foodstuffs division is now studying Europe to develop vast new markets for corn products. The lumber division has prepared a lumber exporters' directory and a uniform contract of sale. The textile division has salvaged $6,000,000 worth of goods in Cuba.

The service of the whole Department of Commerce must grow. It is far too valuable to be limited. That accomplished acid-test operator, Budget Director Dawes, grants this. He has approved the department's request for $20,000,000 for 1922—an increase of $750,000 to extend the service and partially equalize salaries so that the department can fairly compete with business in paying for brains when it gets them. The appropriation will soon come before Congress. That governing body should be left in no doubt as to America's appreciation of this new injection of "more business in government."

The coal industry can selfishly support this work which makes for more and wider markets for coal, both directly and indirectly. That the department has not rejuvenated the export trade in coal is due to no lack of constructive effort. Congress should be told that the coal industry is back of the kind of work the new Department of Commerce is doing and can do for its benefit.

Leap Year for the Coal Miners

WHEN, in 1906, operators in some union fields, particularly Illinois, reversed the usual order and formulated "demands" upon the miners, the occasion was made much of, although the demands were concerned with certain working conditions rather than wages. Until now not since 1906 has the procedure of collective bargaining varied from the usual formulation and presentation of "demands" from the miners' union. In fact, demanding more wages and changes in working conditions provocative of higher mining costs has become a habit with the union. What other excuse could there be for having a convention? Of what use is the union if it fails to elevate wages and earnings? The United Mine Workers has been erected on a program of steady advances. It has never been called upon to meet a substantial reduction or been forced to retreat. Beaten in the field in 1919, it won the strike in Washington. A 27-per cent advance in wages was no small consideration for a six weeks' strike.

The operators' organization in the Central Competitive Field is plainly enough a defensive machine, as distinguished from the aggressive miners' union. Banding together, the operators in western Pennsylvania, Ohio, Indiana and Illinois have for 30 years or more had one major objective, namely, holding the advances on each new contract uniform as between producing districts.

The tide of battle has turned. Through no circumstance of their own making the miners are on the defensive. Casualties already are heavy. Washington, on the western outpost, succumbed last summer; recently the New River field and numerous small locals have surrendered. Now it is a wise general who can recognize the necessity for a retreat and who knows how to conduct such a maneuver without destroying morale and disrupting organization. The British and French armies in March, 1918, began a retreat that progressed until they held but a toehold on the seashore of northern France, but the generals preserved their organizations, ready for a new advance.

Going back again to 1906 we find that not only was precedent broken by "demands" from the operators but, most important of all, the interstate agreement was abolished. In other words, the producers effected individual settlements with mine labor. They assumed the offensive; they turned on their aggressors, the miners' union.

So, when last week the Pittsburgh coal operators and 48 hours later the southern Ohio producers, announced the wages and working conditions that will obtain in their mines after March 31 they did not break all precedent. History is repeating itself. When it is on the aggressive the Central Competitive Field acts not as a unit but each group takes the initiative.

It is, of course, absurd to expect the miners to assemble and "demand" reduced wages. Since union wages must come down there is no point in delaying their announcement, an announcement that can come only from the employers. It is up to the operators this year. Pittsburgh and southern Ohio have taken the first move.

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*Final report of the U. S. Fuel Administration: Report of the Administrative Division, Part II; Government Printing Office.

New Retorts Have Toggle Plates to Release Carbonized Coal and Cooling Chamber in Which to Harden It

Time of Coking, Eight Hours—Each Retort Holds Half a Ton in Two Three-Inch Layers—Coal Dried Before Charging—Rich Gas Obtained and Seven Times Benzol from High Temperature Process

By C. E. Hopkins
London, England

FOR more than twenty years scientists and engineers have attempted to carbonize coal at low temperature. During this time in Great Britain alone vast sums have been spent in experimental work and more than 200,000 tons of coal gathered from the four corners of the earth have been treated. No less than forty-two different types of retorts have been built, tested and found wanting. A commercially successful solution of the problem, therefore, marks a definite advance in the industry of fuel production.

The first known attempt to carbonize coal was made by William Murdock in 1792. The experiments then performed laid the foundations for the present gas industry. The inventor of the process now used was the late Thomas Parker, of Wolverhampton, who in conjunction with others in 1906 formed a private company (Coalite, Ltd.). The original plant, located at Wednesfield, was enlarged and additional plants erected at Barking, Hythe and Plymouth.

In 1911 this process attracted the attention of the Germans, who endeavored to purchase it. After lengthy negotiations it was agreed that upon payment of a substantial sum the Germans should have the right to observe the process for one year. They were so well satisfied with the results obtained that they designed, built and tried out several much improved fireclay retorts, raised capital to continue experimental work in England and organized a staff of German chemists. The war, however, put an effectual stop to their plans.

In 1914 the Barnsley Smokeless Fuel Co., Ltd., was formed to operate an experimental plant, on the site of which the present installation at Barugh was built. The erection of the new plant was seriously hampered by the war, but by 1917 it was partly completed. In this latter year was formed the firm known as Low Temperature Carbonisation, Ltd. The plant was finally completed in November of 1920 and since December of that year, with the exception of the period covered by the coal strike, it has been in continuous and successful operation.

During the long experimental period many difficulties arose. One of these was in determining which was the most advantageous material to employ in building retorts. Although cast iron was at first favored, it is now generally recognized that firebrick is the better. Though cast iron possesses many advantages, such as good heat conductivity, non-permeability by the gases evolved and ease of construction, it corrodes readily and soon begins to warp. It was finally decided, therefore, that firebrick retorts were more advantageous, although the brick is not as good a conductor of heat and the gases pass through it more readily.

Another difficulty which took much time to solve was that of extracting the "Coalite" from the retort. When coal is carbonized at low temperature, it becomes viscous and swells, clogging the retort, so that it cannot be easily extracted. With high-temperature carbonization a large portion of the volatile matter is decomposed and the final volume of the residue is no greater than

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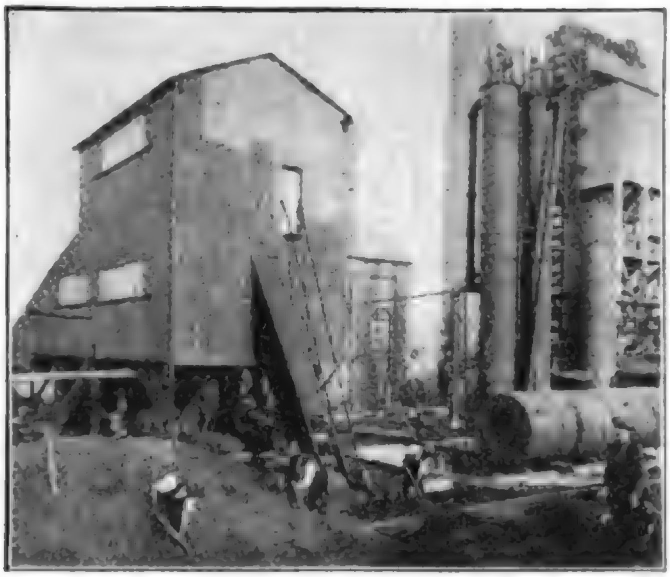
NOTE—The frontispiece shows a general view of the low-temperature carbonizing works at Barugh, near Barnsley, south Yorkshire.



WASHERY FOR CLEANING RAW COAL OF ASH

The process of distillation removes the volatile matter from coal without taking out any of the ash. Thus the ash in anthracite, partly distilled coal and coke is in a sense concentrated. To get a high-grade article the coal should be clean before it is treated or, like the Lykens Valley anthracite, be derived from extremely pure bituminous coal.

that of the original coal charge. The difficulty of extracting the contents of the carbonizing chambers was finally solved by making the retorts vertical and inserting two cast manganese-iron plates, which are separated from each other while the coal is being carbonized. After the carbonization process is complete, these plates are brought together so that the mass of Coalite falls by gravity from the retort into the cooling chamber below.

Still another difficulty which had to be surmounted was the fact that red-hot Coalite easily ignites upon exposure to the air. If quenched with water, on the other hand, it disintegrates to dust. Coke, of course, does not behave in this manner because it contains practically no volatile matter. This problem was finally solved by the aid of a water-jacketed cooling chamber beneath the retort, into which the hot Coalite is dropped and where it remains while the next charge is being treated. When finally removed from the cooling chamber, the Coalite is practically cold, being at a temperature of only about 100 deg. F. Because of this method of treatment, Coalite stands transportation better than does coal itself and does not form any appreciable quantity of breeze.

CONVEYORS CARRYING WASHED SLACK TO BUNKERS

The coal is conveyed by small wheeled cars from the storage bin to the filling hoppers above the retorts.

As previously mentioned, the walls of firebrick retorts are slightly permeable to gas, and this introduced another difficulty. It was found that the gas evolved during carbonization penetrated the walls of the retort, where, with the gas employed in heating, it burned on the outside. This rendered it difficult if not impossible to regulate the temperature with exactitude. This difficulty was overcome by perforating the cast manganese-iron plates within the retorts and drawing off the gases through the central passage between them by suction. This device not only prevented the gases from passing through the walls of the retort but rendered it unnecessary for the gaseous products to pass upward through several feet of hot coal during the carbonizing process with resultant excessive decomposition.

HOPPERS FOR STORING COAL ABOVE RETORTS

These hoppers hold a half a long ton, and the coal in them, being above the retorts and being retained there for eight hours before charging, is warmed and dried. In consequence when it falls into the retorts they do not receive so severe and sudden a cooling as if the coal were wet· furthermore, distillation is more rapid and takes less heat.

The plant erected at Barugh consists of a unit of twenty retorts with a total capacity of 30 tons of coal per 24-hr. day. It is, therefore, well beyond the experimental stage. The material carbonized is a mixture of coking and non-coking slack, and it is considered a remarkable achievement that these two may be mixed with satisfactory results in the proportion of 70 per cent non-coking and 30 per cent coking coal.

One-third of the total coal mined in Great Britain is slack and of this by far the greater portion is a drug on the market. Indeed in many cases this material is left within the mine unless it is necessary to remove it in order to clear the various passages.

Upon arrival at the plant, the slack is washed to free it from slate and dirt, thus insuring that the Coalite will have a low ash content. After washing, the coal is conveyed to a storage tank, from which it is transported in small cars to the filling hoppers above the retorts. These hoppers will hold exactly one charge of coal (1,120 lb.). Here the coal remains for eight hours or during the time in which a charge below is being carbonized. Much of the moisture retained by the coal is thus driven off while the coal itself is warmed up to such a temperature that, when the incoming charge comes in sudden contact with the heated walls, the retorts are not damaged.

When the charge within the retort has been carbonized, a lever is pulled which brings the interior cast-iron plates together. The revolving door below the retort is then opened and the Coalite drops into the cooling chamber below. Another lever opens a heavy rotary gas-tight cast-iron valve at the bottom of the filling hopper and the new charge of warm coal falls into the retort. This operation takes place three times during each 24 hours, so that each retort treats 1½ long tons or 3,360 lb. of coal daily and produces 21 long hundredweights (2,352 lb.) of Coalite.

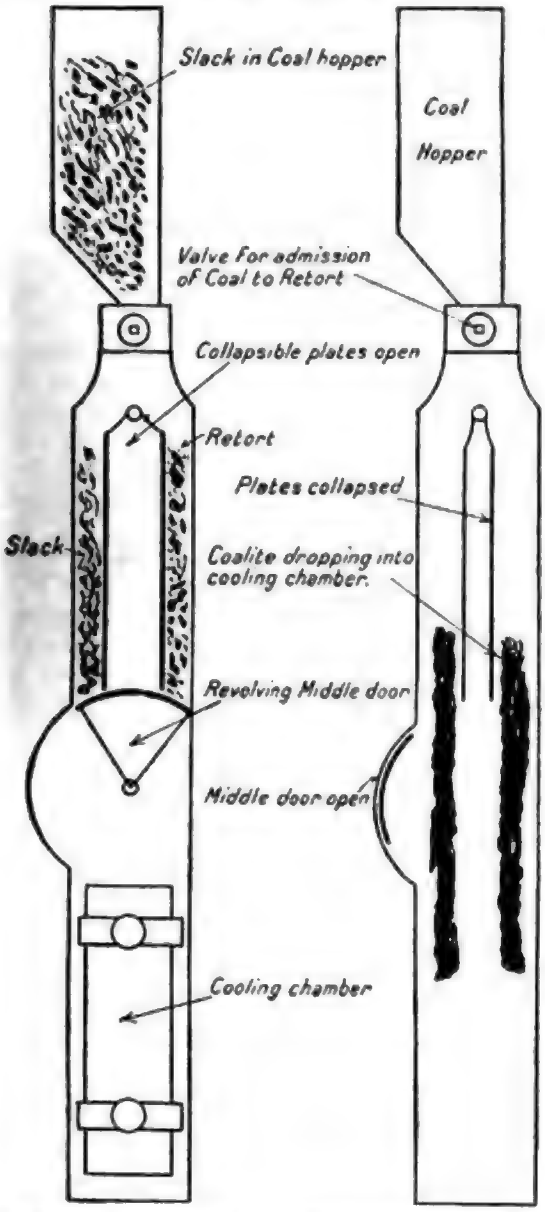
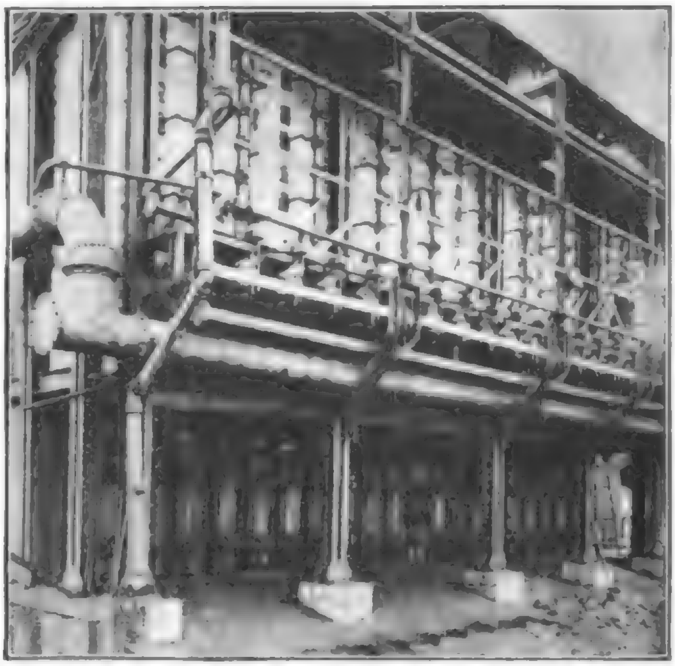


DIAGRAM SHOWING CARBONIZING PROCESS

The hairpin plates in the retort crowd the raw coal into two 3-in. layers against the hot walls, but when the plates are caused to approach and the middle door is opened the coal falls freely into the water-jacketed cooling chamber below.

The patent retorts installed at Barugh are of standard size, being 9 ft. high, 6 ft. 6 in. long and 11 in. wide, inside dimensions. They are built of special firebrick. laid in fireclay cement. Each retort is self-contained, the narrow passage separating adjacent retorts containing the burners. Inside of each retort the cast manganese-iron plates above referred to are suspended from a ridgepole, the distance between them being 4½ in. Thus as the coal enters the retort it is divided into two layers, each about 3 in. thick and separated from the other by the two plates. The coal, being contained in a thin layer, is thus carbonized evenly in spite of the poor heat conductivity of the surrounding walls. The resulting Coalite is thus a uniform, crisp, homogeneous mass.



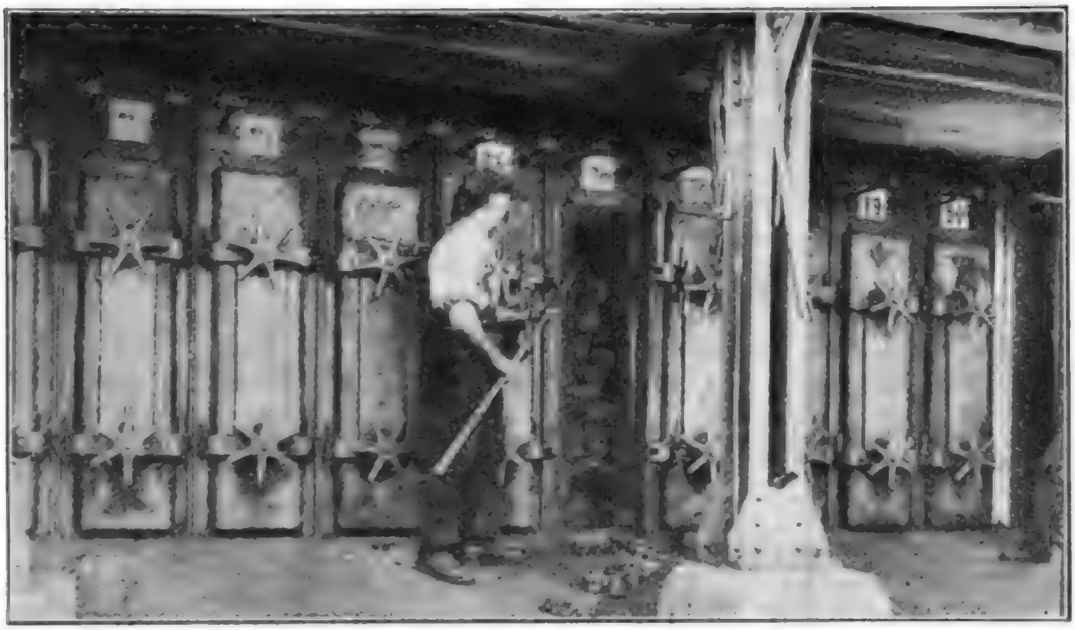
BATTERY OF TWENTY RETORTS AND COOLING CHAMBERS

By pulling the levers just above the large gas main the retorts are made to discharge their contents into the cooling chambers.

Gas burners heat the retorts as in coke-oven practice. At the present time the gas thus employed is the rich product of the retorts themselves. There is little question, however, that this method is wasteful, and it will

STORAGE TANKS FOR BYPRODUCTS OF PROCESS

Ten tons of tar oils are being fractionated at the high-temperature tar distillery. Until the experiments are complete the true possibilities of the byproducts cannot be determined. Only by elaborate tests have the value and best treatment of byproducts from coke ovens been ascertained and the pitches and oils from these ovens must be put through a similar investigation.



Removing Coalite

The product was formerly removed at distillation heat and quenched with water, which caused it to break up into fines. As it was still hot it used to flame quite frequently and burn up. Now it is cooled in an airtight chamber without coming in direct contact with water. The cooling is slow and complete, and the product is consequently quite coarse and unlikely to catch fire.

eventually be found more economical to use a Mond producer plant. The gas burners are arranged in horizontal rows between the retorts, and the flames pass downward through a series of flues until they reach the bottom of the chamber, the temperature being maintained meanwhile by means of auxiliary burners. Peepholes through the brickwork are provided beside the burners and the temperature outside is maintained at about 1,200 deg. F., which corresponds to a temperature of about 1,000 deg. F. inside the retorts. The heating efficiency of this system is high, probably 15 per cent higher than that of the ordinary coke oven and far above that of the average gas works.

Coalite, or the fuel produced by this low-temperature carbonization process, is of a novel character, being unlike either coke or coal in appearance, yet combining the good qualities of both. It is a smokeless fuel, yet is easy to ignite and keep burning, is light and clean to handle and gives off none of the sulphur fumes which render a coke fire objectionable. Weight for weight, Coalite is twice as bulky as coal and lasts almost twice as long, while the radiant efficiency of a fire of this material is nearly double that of an ordinary coal fire. For many household purposes Coalite will satisfactorily replace coal. As it is a fuel of slow combustion it is particularly suitable for house-heating furnaces or for consumption in anthracite stoves.

The full industrial value of coal has not been determined but it seems obvious from the nature of the fuel that it could be used most effectively in pulverized form. It is common knowledge that powdered coal falls far short of what has been expected of it. This is partly on account of the formation of ash and clinker and partly because of the difficulties experienced in reducing the coal to the proper size. Raw coal being somewhat greasy, the fine particles to which it is reduced in crushing slip upon each other and are difficult to powder. On the other hand, Coalite, being a hard, close-grained, non-greasy substance, powders easily and does not demand the erection of an elaborate and costly pulverizing plant.

Experiments on pulverized Coalite are now being made, and the results thus far achieved have been eminently satisfactory. It has already been demonstrated that powdered Coalite is far superior to powdered coal. Burned in suspension, Coalite forms no clinkers and but little ash, most of which is blown away by the draft. It generates an intense white heat and

Retort House

Note the several hundred tons of coalite in the foreground being shoveled into coal cars. It will be interesting to note that these gondolas are provided with side doors to facilitate the loading and especially the unloading of material placed in them. The small cars make the buying of a carload lot an easy financial transaction.

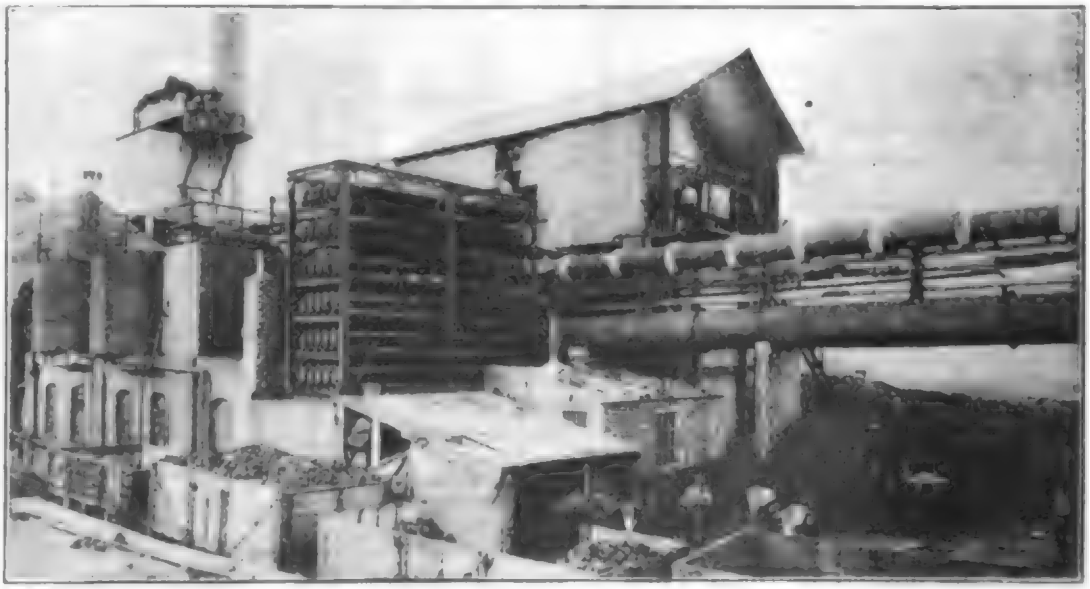


TABLE I. YIELD OF BYPRODUCTS FROM 1 LONG TON OF AVERAGE COAL, CONTAINING 25 TO 30 PER CENT OF VOLATILE MATTER

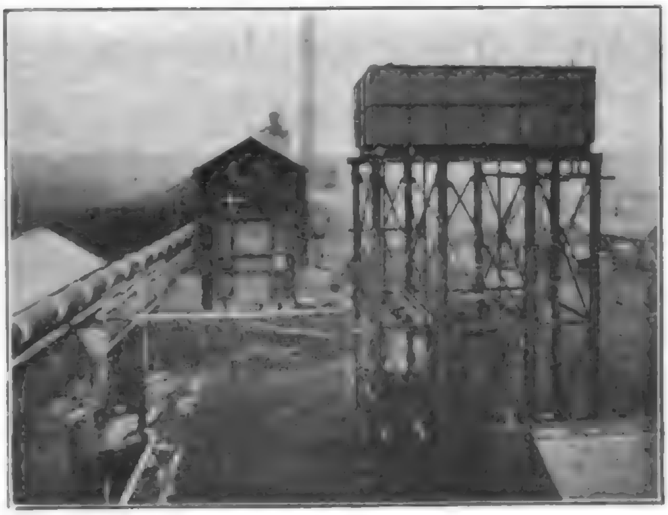
	Low-Temperature Carbonization	High-Temperature Carbonization Gas Works	Coke Ovens
Temperature of Carbonization....	About 1,000° F.	About 1,800° F.	About 1,800° F.
Gas................	5,000 to 6,000 cu.ft. (700 to 750 B.t.u.)	12,000 cu.ft. of medium quality town gas (550 B.t.u.)	11,500 cu.ft of poor quality coke-oven gas (450 B.t.u.)
Liquid Products.....	18 to 20 gal. of tar oil (fractionated to 3½ gal. of motor spirit, 8 to 9 gal. of fuel or Diesel oil, the rest being lubricating oil.)	10 gal. of coal tar. Fractionated to about ½ gal. motor spirit, some fuel oil, a large quantity of naphthalene, etc.	8 gal. of coal tar.
Sulphate of Ammonia	15 lb.	25 lb.	28 lb.
Residue in Retort...	1,568 lb. smokeless fuel Coalite (9 to 10 per cent volatile matter.)	1,512 lb. of soft coke (about 1 per cent volatile matter.)	1,565 to 1,624 lb. of hard metallurgical coke (less than ½ per cent volatile matter.)

is non-explosive. It is the opinion of some responsible engineers that in many cases the use of powdered Coalite will increase the efficiency of existing equipment as much as 30 per cent. Little doubt is entertained that the use of pulverized Coalite can be extended to steamship propulsion and to locomotives with increased efficiency in each case.

In the past it has sometimes been questioned whether low-temperature carbonization would pay financially. The high-temperature carbonization process always has been a paying proposition and the cost of erecting and operating a plant working at low temperature is said to be no greater than is that of one employing high temperature. Furthermore, the byproducts derived from the low-temperature process greatly exceed in value those obtained from the high-temperature process. This may be seen from Table I.

Granting that the cost of operating Coalite retorts is the same as that of handling byproduct coke ovens, it would seem from the table that low-temperature carbonization should offer not only financial possibilities but even larger profits than are derived from carbonization at high temperatures. It has been estimated by Sir Percy Girouard, the engineer and director of the Armstrong-Whitworth establishment, after carrying out an independent investigation into the possibilities of this process, that the possible profit obtainable by carbonizing one long ton of coal slack is 17s. 11d. ($4.35 at normal exchange). It is believed that this estimate is conservative.

In it no account was taken of the richness of the gas produced in this process, and the benzol production was assumed to be only one gallon per ton, whereas the normal yield is well above three gallons. Tests are now being made upon the tar oil yielded, and it is expected that discoveries will soon make it possible to increase appreciably the value of this derivative.



BIRDSEYE VIEW OF THE BARUGH PLANT

Looking toward the end of the retort house. For an experimental plant the construction is unusually substantial from an American viewpoint.

One of the most interesting aspects of low-temperature carbonization, and from the British point of view, decidedly the most important consideration, is its bearing on the oil problem. At present Great Britain is entirely dependent on foreign countries for its oil supply. Furthermore, the oil output of the world is failing, the total world's production now being only about 600,000,000 barrels, equivalent in heating value to 150,000,000 tons of coal. Thus the entire oil production of the world is not equal in available heat content to the coal actually used in Great Britain alone, and is only equivalent to 8 per cent of the world's coal output.

By carbonizing at low temperature the 140,000,000 tons of coal now used every year in its raw state in Great Britain more than 400,000,000 gallons of motor spirit could be produced annually without interfering with existing processes. This is nearly twice the present consumption of the whole country. In addition to this motor spirit the carbonization of 140,000,000 tons of coal would yield about 1,250,000,000 gallons of Diesel and lubricating oils.

One of the leading engineers of Great Britain has expressed the opinion that the perfection of the low-temperature carbonization process is the most important industrial event since the invention of the steam engine and some believe that the universal adoption of low-temperature carbonization will herald a new industrial era.

Retort House

The product stores well and does not suffer in transportation. Only about 5 per cent of the Coalite is breeze, yet in its manufacture 70 per cent of non-caking slack is used.

Can Anthracite Mines and Preparators Be Operated with Advantage on More Than One Shift Per Day?—II*

Economies in Cost of Large Preparators So Great That Small Three-Shift Plants Would Fail to Yield Savings Expected — Summary of Advantages and Disadvantages Shows Latter Outnumber Former

By Dever C. Ashmead†
Kingston, Pa.

Unfortunately few figures are available to show how a change from single- to triple-shift operation would affect the cost of development. In Table I data from which this effect may be judged have been brought together.

If, Case I, the preparator were operated upon three capacity shifts, or, in other words, the output was trebled, then full advantage of the equipment investment would be taken, but the investment in the preparator would need to be increased to provide more machinery to take care of breakdowns and permit continuous operation.

If, Case II, the total output is to remain the same and the present preparator is to run on three shifts, then no advantage will be obtained, as the investment remains the same, provided no new preparator is constructed. Although operated continuously, only one-third of the capacity of the equipment is being used in each shift and therefore there is practically no greater use of the investment in three-shift than in one-shift operation.

It remains for us to inquire (Case III): What would be the effect of building preparator one-third the size were the larger building burned down? Could such a plant be operated to advantage on a triple shift so as to make its output equal to that of the preparator it replaced? Looking at the table it will be seen that the preparators of mines Nos. 1 and 3 each have approximately one-third the capacity of the preparator at mine No. 5, all three being modern steel buildings of the same general type. The average cost of the smaller buildings is $200 per ton capacity, whereas the cost of the larger building is $180. In the instance cited it will be seen that the investment on a small building is a little greater than for a large one, but when worked with triple shifts the smaller plant is by far the less expensive.

Taking mine No. 2, which has approximately one-third the capacity of mine No. 4, it is found that the cost of the preparator per ton capacity of the smaller operation is $205, as against $103 for the larger. This latter relation is more typical of the average condition in the anthracite field than is that made in the preceding paragraph, as in that instance the preparator for mine No. 6 cost more than is usual owing to certain conditions peculiar to its construction. Therefore a preparator one-third the size of another will cost approximately 100 per cent more per ton of output.

TABLE I. COST OF CONSTRUCTION AND OTHER PREPARATOR OPERATING DATA AS OF 1920

	Mine No. 1	Mine No. 2	Mine No. 3	Mine No. 4	Mine No. 5
Maximum capacity, tons daily	1,800	1,500	1,800	4,800	6,000
Cost of construction	$358,835	$307,865	$360,346	$495,976	$1,078,000
Cost per ton of capacity	$199	$205	$202	$103	$180
Total number of employees	39	26	39	59	56
Tons prepared per day per employee	46	54	46	81	107
Tons coal prepared in 1920	299,883	222,792	326,569	515,169	997,563
Average tons prepared per day	1,082	883	1,320	1,812	3,420
Per cent of maximum capacity	60	59	73	38	57

With triple shifting a larger quantity of supplies must be carried in stock as a reserve to be used in case of breakdowns, as it would not be possible to repair the equipment, for it could be continually running. Furthermore, as it could not be maintained in as good condition, it would have to be the sooner replaced.

A saving would be effected by triple shifting, because the demand for power would be steady and stand-by losses would be avoided. All the power, no matter when produced, would directly promote the production of coal.

The Vexed Question: How to Store Output?

If the mine is planned to operate on three shifts and the preparator on one shift, then the coal mined while the preparator is idle must be stored. There are two places for the storage of this coal—on the surface and underground—and there are three methods that can be used in one place and two in the other.

For surface storage, pockets must be provided or the coal be dumped in piles on the ground or retained in the mine cars. It will be necessary to construct storage pockets of such capacity that they will hold the output from two shifts and to design them so that degradation will be small and the coal can be loaded out of them economically. If the coal were to be stored in stockpiles a suitable method would have to be provided to handle the coal from the mine cars to the stockpiles and from the piles to the preparator. This system must be so designed that the degradation of the coal will be reduced to a minimum, and the coal must be recovered cheaply. Also some method for keeping the coal from freezing in cold weather will be needed.

If the storage is to be underground, the coal may be stored in mine cars, or, if the measures are steeply pitching, it can be stored in the breasts themselves. If the first method is chosen, enough cars should be provided to handle the output for a period of twenty-four hours; at least, the number of cars should suffice to hold the coal two full shifts and to handle the coal during the shift that is being worked while the preparator is running. Although it has been said that this storage is to be underground, in warm weather all or part of the cars could be held on a siding on the surface and in cold weather a thaw shed could be used.

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*Article entitled "Can Anthracite Coal Mines Be Operated Profitably on More Than One Shift?" to be presented before the February meeting of the American Institute of Mining and Metallurgical Engineers in New York City.

†Anthracite editor, *Coal Age*.

If the cars are to be left underground, then ample additional siding space must be provided, and this is extremely expensive, especially underground, where sidings usually involve excavation and timbering.

If the measures in general pitch steeply, the coal can be stored in the breasts during two of the shifts and drawn out only while the preparator is operating. This would mean that a somewhat smaller number of mine cars would be needed. Underground haulage force would be lessened in this case, as no coal would be hauled during two of the shifts except in those portions of the mine where the measures are so level that the coal will not run out of the breasts. Fewer men also would be required for hoisting, as this operation would go on during only one shift. This would reduce the number of headmen and footmen, but would not entirely eliminate them during the two shifts during which no coal was being hoisted, as supplies would be handled and men raised and lowered.

MINE CAR STORAGE ALONE OBVIATES BREAKAGE

Of the two methods of surface storage that in mine cars is the better, as in this case the coal has to be handled only once and therefore there is no degradation. If stored in piles on the surface second handling of the coal cannot be avoided and the coal is broken and subject to attrition. The cost of providing storage room is excessive and the extra handling of the coal increases the operating expense. If the storage is made underground, mine cars are used for that purpose, and then a greater investment in mine cars is required and an inevitably increased cost for sidings also will have to be met.

The converse of this case occurs when the preparator is to be operated on three shifts and the mine on one shift. Here it is again necessary to store coal. Two-thirds of the coal produced during the one mine shift must be handled or stored to supply the three-shift operation of the preparator. In this case, however, underground storage would be unreasonable, for if the coal were stored in the breasts, then it would be necessary to have three-shift operation of all underground work except cutting the coal. If the coal was stored in mine cars, then the hoist would run steadily in all three shifts. Either of these methods would make the operating costs so excessive as to be unworthy of consideration.

If the storage were on the surface the objections would be excessive degradation and the cost of constructing sufficiently large pockets and unloading and reloading machinery. Besides, the cost of rehandling this coal would add to the cost.

Therefore the conclusion must surely be reached that the storage of coal from the mine due to the single-shift operation of either mine or preparator is not feasible and would increase mining costs unreasonably.

If an anthracite mine were to be operated on the three-shift plan and the railroad would not make provision to furnish cars when they were needed, longer empty and loaded tracks would have to be provided for railroad cars, so that on the off-shifts a sufficient supply of cars might be on hand.

If a considerable number of anthracite collieries were put on the three full shifts and their outputs trebled, then there would be a tendency to overproduce, and the markets would be apt to be glutted. This would particularly affect the steam sizes, which under present conditions are sometimes quite difficult to dispose of.

It would be well to tabulate the ways in which triple shifting might be arranged, noting in each case the favorable or unfavorable results proceeding from a deviation from the time-honored plan of single-shifting mine and preparator.

Assumption No. 1: A mine of normal production operating under present methods, with the preparator run on a single shift. Assumption No. 2: An old mine with the preparator in good condition and operated with first and second mining. It is desired to place the mine on full three-shift operation so as to treble the output. Assumption No. 3: An old mine that can be operated by dividing the present force into three parts, each part working an integral portion of the mine, and operating the preparator on a three-shift basis, (a) by working different beds in different shifts, (b) by working different shafts, slopes or drifts in different shifts.

Assumption No. 4: The whole mine worked on a one-shift basis and the preparator on a three-shift basis. Assumption No. 5: A new mine with a preparator to be so planned as to operate on three shifts.

Assumption No. 6: A new mine to be laid out to operate on three shifts and the preparator on one shift, (a) the output to be the same as operating under present methods, (b) the output to be the maximum for each shift.

Assumption No. 7: A new mine, to be designed to operate on one shift and a new preparator on three shifts. Assumption No. 8: A consolidation of two or three collieries into one, each to be operated on a separate shift and the preparator to be operated on a three-shift basis.

Assumption No. 9: A consolidation of two or three collieries, each to be operated on three shifts and the preparator on a single shift. Assumption No. 10: A consolidation of two or three collieries, all to be operated on the same shift and the preparator on three shifts. Assumption No. 11: Two of three collieries to be abandoned and work to be concentrated in one colliery producing the same tonnage as obtained from the three. Both colliery and preparator to be operated on three shifts.

The ten main conditions that have to be considered in the multiple shifting of anthracite collieries are shown in the foregoing list and in Table II, p. 204. Besides these there are others which might arise in reference to any particular colliery.

YET SOME CONDITIONS FAVOR TRIPLE SHIFT

There may be individual cases where multiple shifting of anthracite mines might be advisable due to conditions that are not general throughout the fields. It might be advisable to adopt this method in case of an accident which would deprive men of employment and the company of output, or in case of a serious shortage of coal, or a pending expiration of the lease on a property. Such an operation would not be multiple-shifted for any saving in operating expenses or to obtain a continuous use of capital but to meet special conditions.

Double shifting instead of triple has not been mentioned, but the conditions and the items affecting this provision would be similar but less in degree. From a study of the preceding it will be clear that not one of the methods enumerated would be as economical and practicable as that in which mine and preparator work one shift at the same time and during the day.

TABLE II. THIRTEEN OPERATING METHODS WITH THEIR ADVANTAGES AND DISADVANTAGES LISTED AND SUMMARIZED

Assumptions		Number of Shifts Operated		Labor				Number of Men Underground																	Number of Items			
No.	Description	Mine	preparator	Disturbances	Need for Contract Work	Mine Efficiency	Outside Efficiency	Miners	Pump Men	Foremen	Ventilation	Transportation	Hoisting	Silting	Development	Second Mining	Preparation Number of Men	Outside Number of Men	Cost of Mine Development	Cost of Preparator Equipment	Supply Account	Cost of Power	Coal Storage	Effect on Market	R. R. Car Supply	Favorable to Operation	Normal	Unfavorable to Operation	Conclusions
1	Mine of normal production operating under present methods..........	1	1	None	None	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Suf.	Suf.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	0	22	0	This is the present normal method of operating an anthracite mine, with which all the others are compared.
2	Old mine with preparator in good condition placed on three full shifts	3	3	Yes	Yes	Dec.	Dec.	Inc.	Dec.	Nor.	Nor.	Nor.	Nor.	Nor.	Insuf.	Insuf.	Inc,	Dec.	Dec.	Dec.	Dec.	Dec.	No.	Bad	Dif.	6	6	10	Both the inside and outside operating costs would decrease, but the preparation cost would increase. Serious labor troubles would arise and the efficiency of the men would be reduced. It also would be impossible to get sufficient development and the market could not absorb the coal.
3a	Old mine with normal output. Mining different beds............	3	3	None	None	Dec.	Dec.	Inc.	Nor.	Inc.	Inc.	Inc.	Inc.	Inc.	Suf.	Suf.	Inc.	Inc.	Nor.	Nor.	Inc.	Inc.	No.	Nor.	Dif.	0	9	13	This assumption does not show any items that are in favor of the multiple-shift operation. Therefore it would be far less favorable than one-shift operation.
3b	Same as 3a but mining different openings instead of different beds.....	3	3	None	None	Dec.	Dec.	Inc.	Nor.	Nor.	Nor.	Nor.	Nor.	Inc.	Suf.	Suf.	Inc.	Inc.	Nor.	Nor.	Inc.	Inc.	No.	Nor.	Dif.	0	13	9	Labor efficiency would decrease, outside and preparation costs would increase, as would the power and supply accounts. There is not one item that is in favor of this assumption.
4	Old mine with normal output....	1	3	None	None	Nor.	Dec.	Nor.	Nor.	Nor.	Nor.	Inc.	Nor.	Inc.	Suf.	Suf.	Inc.	Inc.	Nor.	Nor.	Inc.	Inc.	Yes	Nor.	Dif.	0	13	9	Mine operation is practically normal. Increased costs of preparation and for outside labor, together with storage of coal, make this assumption unfavorable.
5	New mine, maximum output on each shift.... ...	3	3	Yes	Yes	Dec.	Dec.	Inc.	Dec.	Inc.	Nor.	Nor.	Nor.	Nor.	Insuf.	Insuf.(*B*)	Inc.	Dec.	Dec.	Dec.	Inc.	Dec.	No.	Bad	Dif.	5	5	12	Labor troubles together with the increased cost of preparation and flooding of the market make up for any of the advantages gained by increased use of capital and decreased cost of power. There would be insufficient development.
6a	New mine with output same as if operating under present methods .	3	1	None	None	Dec.	Nor.	Inc.	Nor.	Inc.	Inc.	Inc.	Inc.	Nor.	Suf.	Suf.(*B*)	Nor.	Inc.	Inc.	Nor.	Inc.	Inc.	Yes	Nor.	Nor.	0	11	11	Here no advantage is shown as likely to be gained from operating under this assumption. Operating costs are heavier, and there would be not enough development.
6b	New mine same as 6a but having maximum output on each shift........	3	1	Yes	Yes	Dec.	Nor.	Inc.	Dec.	Nor.	Nor.	Nor.	Nor.	Dec.	Insuf.	Insuf (*B*)	Dec.	Dec.	Dec.	Dec.	Nor.	Dec.	Yes	Bad	Nor.	7	7	8	Labor troubles, decreased efficiency, the failure to secure development of sufficient working places and the storage of coal make up for any gain in reduction of operating expenses or more continuous use of capital.
7	New mine with normal output....	1	3	None	None	Nor.	Dec.	Nor.	Nor.	Nor.	Nor.	Inc.	Nor.	Inc.	Suf.	Suf. (*B*)	Inc.	Nor.(*C*)	Nor.	Dec.	Inc.	Dec.	Yes	Nor.	Dif.	2	13	7	The decrease in the cost of the preparator and power would not make up for storage of coal and increased operating expenses.
8	Consolidation of three mines each operating on different shifts.........	3	3	Yes	None	Dec.	Dec.	Inc.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Suf.	Suf.	Inc.	Inc.	Nor.	Dec.	Dec.	Dec.	No.	Nor.	Dif.	3	12	7	Decreased efficiency of men, together with labor disturbances, increased outside and preparation costs are not counterbalanced by the decreased amount of capital, supply account and power costs. Hence this assumption is not feasible.
9	Consolidation of three mines each operating on different shifts......	3	1	Yes	None	Dec.	Nor.	Inc.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Suf.	Suf.	Nor.	Inc.	Nor.	Nor.	Nor.	Nor.	Yes	Nor.	Nor.	0	17	5	This assumption approaches most nearly to present normal methods of operation. However, in five items this method of operation is not as favorable as one-shift operation.
10	Consolidation of three mines all on one shift..........	1	3	None	None	Nor.	Dec.	Nor.	Nor.	Nor.	Nor.	Nor.	Nor.	Inc.	Suf.	Suf.	Inc.	Nor.	Inc.	Dec.	Inc.	Dec.	Yes	Nor.	Dif.	2	13	7	The increase in cost of preparation, storage of coal and in cost of mine development is not counterbalanced by decreased preparator equipment and power costs.
11	Consolidation of three mines, abandoning two and tripling output of third..........(*A*)	3	3	Yes	Yes	Dec.	Dec.	Inc.	Dec.	Nor.	Nor.	Nor.	Nor.	Nor.	Insuf.	Insuf.	Nor.	Nor.	Dec.	Dec.	Nor.	Nor.	No.	Nor.	Dif.	3	11	8	The three decreases—in the number of pumpmen, cost of mine development and preparator equipment—do not counterbalance the losses caused by labor troubles, decreased efficiency of the men, impracticability of getting sufficient working places. So this assumption is unfavorable.

In this table, nor. means normal, as compared with assumption No. 1; inc., increase; dec., decrease; suf., sufficient; insuf., insufficient; dif., difficulties might arise.

(*A*) In this case the capital invested in the other two mines would stand idle and the upkeep, cost of pumping, repairs and watchmen would continue. (*B*) In case the mines were new and just starting — not old mines reopened—this would not apply. (*C*) Or increase.

What Is the Real Aim in Washing Coal and How Can Washing Efficiencies Best Be Calculated?

By Charting the Results of Coal Separation in Fluids of Different Densities a Specific Gravity Is Found Which Can Be Attained Without Too Great a Waste of Coal

By Erle G. Hill*
Pittsburgh, Pa.

THE efficiency of any operation usually is regarded as the ratio between the useful work accomplished and the work that could be achieved by a perfect appliance. As the "sink and float" test is to be considered as a means of studying the efficiency of coal-washing operations, it is necessary that the true object of coal washing be clearly understood. If this be known, then the amount of useful work can be determined.

Undoubtedly the principal aim in a washing process is to reduce to a minimum the impurities in the coal, but in the process of eliminating the impurities a minimum quantity of good coal should be lost. Therefore we have as our object maximum reduction of impurities and maximum recovery of good coal.

A study of the impurities will show that they can be divided into two classes: (1) Inseparable impurities; those impurities which are incorporated in the structure of the coal itself in such a manner as to be an integral part of it. (2) Separable impurities; those impurities which are not an integral part of the coal structure and can be separated, provided they have been sufficiently liberated from the coal by breaking or crushing.

Inseparable and Separable Impurities

Under the first class may come fine mineral matter that was deposited with the coal or was an integral part of it. This may be either ash-bearing material, as clay, silica, etc.; or sulphur-bearing material, as organic sulphur. The ash-bearing material may, however, make up such a large percentage of the mass as to throw it into the class of "bone" and instead of being an inseparable impurity it may then be an integral part of a separable impurity.

Separable impurities are such substances as fireclay, shale, silica, "bone," pyrite and gypsum. Generally speaking, the most important of these, as far as the washery operator is concerned, are clay, shale, bone and pyrite. Clay, shale and bone will be considered as ash-bearing impurities and pyrite as a sulphur-bearing impurity, and may be referred to as "ash" and "sulphur." Those wishing a fuller description of impurities and their occurrence are referred to a paper by Messrs. Frazer and Yancey.[1]

It is not within the scope of this paper to go into the theory of the separation of impurities from coal. A good exposition of this subject will be found in Mr. Drakeley's paper, "Coal Washing: A Scientific Study."[2] Separation depends mainly on the difference in specific gravity of the impurity and the coal, and on the possibility of mechanically unlocking the two. Specific gravities of bituminous coals and their impurities are given in Tables I and II.

It will be seen from the above data that the relative specific gravities of all the impurities with the exception of bone are so different from those of coal that theoretically there should be no trouble in separating true impurities from good coal. Most coals, excepting anthracite, have a specific gravity of less than 1.35 and impurities 1.65 or more. Where they are so mixed that we get material of intermediate specific gravity, however, separation may be more difficult. This is where the second factor of separation, of the particles, comes into the problem.

If the material can be crushed to such a state that each particle of impurity is broken away from the coal, theoretically there is hope for a clean separation. Whether or not crushing to such a point is practical depends on the size of the impure particles, allowable cost of crushing and type of machine in which coal is to be washed. Mr. Drakeley states that in coals tested for washing in jigs, ¼ in. was found to be the smallest practical size to which coal could be crushed for liberating ash.

Messrs. Frazer and Yancey give results of a test on a Pennsylvania bituminous coal which indicate that it should be crushed to ⅛ in. Evidently the fineness of crushing must be decided for each coal washed.

Up to this point the separation of coal and impurities

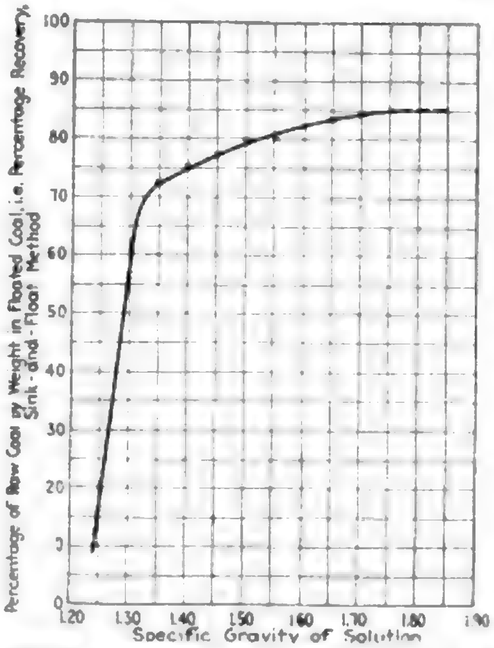

FIG. 1. CURVE SHOWING FLOAT OBTAINED ON DIPPING RAW COAL IN SOLUTIONS OF DIFFERENT DENSITIES

The difference in recovery between specific gravities 1.30 and 1.35 is 15.76 per cent but between 1.35 and 1.40 it is only 2.88 per cent. The difference in ash, as shown in Fig. 2, is 0.41 per cent between densities 1.30 and 1.35 and 0.46 between 1.35 and 1.40. Thus just below a density of 1.35 a reduction of 0.1 per cent in ash content reduces the recovery 3.84 and just above 1.35 an increase of 0.1 in ash content increases the recovery only 0.62. That is why 1.35 would be a good specific gravity on which to devide this coal. Above it too little is saved per per cent of ash added and below it too much is thrown away per per cent of ash deducted.

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[1] Bulletin No. 153, American Institute Mining Engineers, September, 1919.

[2] Transactions American Institute of Mining Engineers, Vol. LIV, page 418.

TABLE I—SPECIFIC GRAVITIES OF COAL AND IMPURITIES IN ILLINOIS COAL ACCORDING TO LINCOLN[3]

Coal Bed	Coal Field	Town	Bright Coal	Dull Coal	Bone	Shale	Pyrite	Calcite
2	Northern	Granville	1.14–1.16	1.20–1.21		2.03–2.64		..
2	Northern	Streator	1.15–1.20	1.20	1.42	2.50	2.43 (bone)	..
6	Danville	Danville	1.20–1.22	.....	.....	2.54–2.62	4.17 (partings)	2.10
6	Central	Pana	1.21–1.22	1.24	..	.....	4.95 (crystal)	....
6	Central	Collinsville	1.20	1.25–1.31	.....	.....	.....	....
6	Southern	Carterville	1.26–1.30	.....	1.44–1.73	2.21–2.50	3.77 (partings)	....
6	Southern	Herrin	1.24–1.31	.....	1.47–1.91	2.41–2.59	.....	....
6	Southern	Marion	1.24–1.28	.....	1.47–1.95	2.26–2.47	.....	....

The values for specific gravity here given are lower than those given by other authors and than those determined subsequently in the mining laboratory of the University of Illinois. This difference is probably due to the fact that the values here given were determined without first heating the coal in hot water to remove the air.—H. H. Stock.

has been discussed. So-called coal grades gradually into bone, however, and it must be decided what is to be considered as "coal" and what as impurity. If by "coal" is meant a pure coal containing no moisture, sulphur or ash, then there is no such substance obtainable by any washing process. From the tables it will be seen that the possible constituents of raw coal may vary in specific gravity from 1.14 to a point well above 1.80.

Indeed it is possible to find carbonaceous material corresponding to most any specific gravity within this range. The question then becomes this: At what point can a line be drawn where all material having a specific gravity less than this shall be known as "coal," and all with a greater specific gravity as impurity? As this must of necessity be an arbitrary division, it follows that there is a great difference of opinion as to what is "coal" in washing operations and what is impurity.

Obviously the investigator must first set a certain standard. He must say to himself: "If I could make a perfect separation of my raw material into two groups, finished product and refuse, what would be the specific gravity of the dirtiest piece of material I would allow in my finished product?" In other words what would he like to keep and what discard? If he can answer this question, he can say: "Material having this or a lower specific gravity is "coal" and all other is impurity." Not that he ever hopes to attain this ideal separation in practice, but it gives him a foundation upon which he can base his value of 100-per cent efficiency.

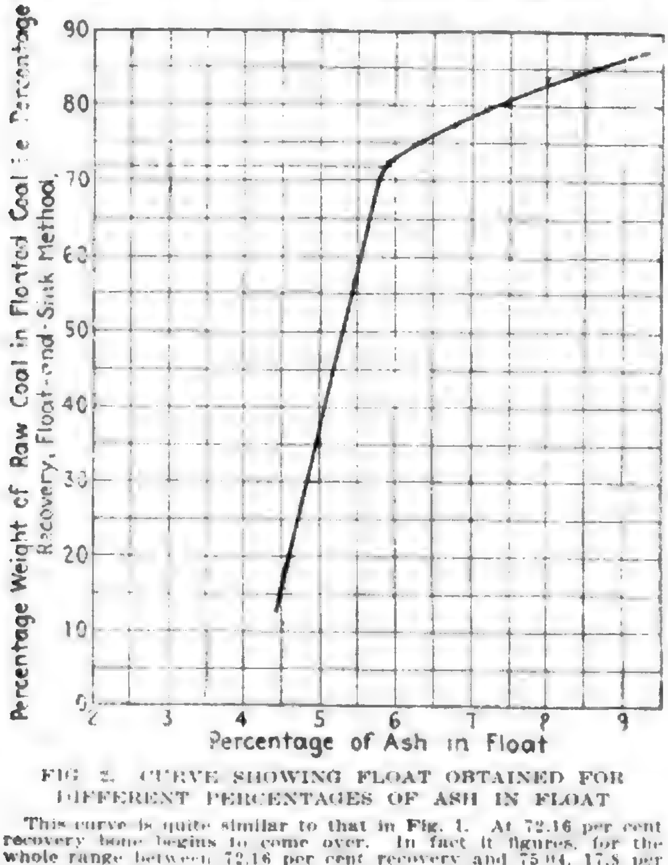

FIG. 2. CURVE SHOWING FLOAT OBTAINED FOR DIFFERENT PERCENTAGES OF ASH IN FLOAT

This curve is quite similar to that in Fig. 1. At 72.16 per cent recovery bone begins to come over. In fact it figures, for the whole range between 72.16 per cent recovery and 75.04, 17.8 per cent ash. Hence more than one-sixth of the material coming over is incombustible.

How is this limiting specific gravity to be selected? The "sink-and-float" test is a means of solving the problem. This test is based on the fact that by using a solution of a definite specific gravity it is possible to divide into two groups a sample of material in which the particles have various specific gravities, the separation being based solely on difference in specific gravity. It will be clear, then, that if the solution of the right specific gravity be found, the ideal separation can be made. Hereafter the material that floats will be spoken of as "float" and that which sinks as "sinkings."

If a series of solutions be made up, with specific gravity ranging from 1.20 to 1.85, and samples of the raw coal to be washed be tested in each solution, the amount of float and sinkings in each solution can be determined, and these products analyzed for ash and sulphur. If the results from these tests be tabulated and compared, the solution that gives the best separation, with the highest recovery of coal can be selected. The specific gravity of this solution is then that of the dirtiest particle that we wish to call "coal."

A simple method of selecting this specific gravity is given by Mr. Drakeley in his paper on coal-washing efficiency.[4]

From the tabulations showing the results of the sink-and-float test on the raw coal a curve can be plotted, the ordinates being the quantity of float in terms of percentage of weight of raw sample, and the abscissæ the specific gravities of the solutions in which the corresponding floats were obtained.

Table III shows the results from such a test and Fig. 1, the curve drawn from these results. If a second curve be drawn, using the weight of float (or the recovery) in terms of percentage of raw coal, as ordinates and the percentage of ash in the float as the abscissæ, it will be seen that there is a point at which the curve breaks sharply. (See Fig. 2.)

From this point on the percentage of ash in the float increases faster than does the amount of float, thus showing that some substance containing a far larger amount of ash than the material previously floated is now entering the float. In other words, up to this

TABLE II—SPECIFIC GRAVITY OF COAL AND IMPURITIES IN COAL ACCORDING TO DRAKELEY

	Range	Average
Coal	1.17–1.35	1.30
Bone	1.35–1.65	1.50
Carboniferous shale	1.65–2.15	1.85
Shale	2.15–2.55	2.40
Coal or shale with pyrite	2.55–4.80	3.65
Pyrite	4.80–5.20	5.00
Quartz	.....	2.60

Bulletin 320, U. S. Geological Survey gives the average specific gravity of 18 average coals as 1.34.

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[3] Bulletin No. 69, University of Illinois Engineering Experiment Station.

[4] Transactions, American Institute Mining Engineers, May, 1920.

TABLE III—SINK-AND-FLOAT TEST ON A BITUMINOUS COAL

Specific Gravity of Solution	Recovery by Weight as Percentage of Raw Coal	Ash Content of Float Per Cent
1.25	16.25	4.50
1.30	56.40	5.42
1.35	72.16	5.83
1.40	75.04	6.29
1.45	77.62	6.76
1.50	79.55	7.19
1.55	80.36	7.43
1.60	82.44	7.49
1.65	83.72	7.96
1.70	84.53	8.32
1.75	85.14	8.59

point a fairly uniform product has been floated; from this point on, if the recovery is to be increased, it must be done at the expense of purity of the product.

Now if the object of washing be recalled, namely, maximum reduction of impurity and maximum recovery of good coal, it will be seen that the above point indicates as nearly as possible an ideal condition.

From Fig. 1 can be found the specific gravity of the solution giving this recovery. This specific gravity then is that of the dirtiest particle desired in the ideal washed coal. Mr. Drakeley found this specific gravity to be about 1.35 for the coals which he tested. Looking back at the tables showing specific gravities it will be seen that this checks fairly well with the dividing line between coal and impurities.

Solutions of 1.30 or 1.35 usually have been used by investigators as the solution for separating "coal" from impurities. This should be determined, however, for the coal to be studied. If a coal were made up largely of an inseparable impurity the point of break in the second curve would be found to correspond to a higher specific gravity, or if the coal contained only inseparable impurities uniformly distributed throughout the raw coal, there would be no break.

This, however, would not destroy the usefulness of the curve; the curve would show that the raw coal could not be separated into "coal" and impurities, and the maximum recovery would be the raw coal. The above curves are for ash-bearing impurities; sulphur could be treated in the same manner.

The limiting specific gravity having been selected, the investigator is now in a position to study the efficiency of a washing machine, or process. If a machine could separate all the particles of a specific gravity less than the standard from all particles of a greater specific gravity, it would be producing the ideal separation, and it could be said that the machine was 100 per cent efficient. For various causes such an exact separation as indicated is never effected in a practical machine, and in fact no operator would expect such a clean division, and in some cases would not desire it. However, this does give him a standard with which he can compare the work of his various machines, or the same machine at various times. These comparisons may be made as follows.

The raw coal as fed to the machine having been tested to establish the standard specific gravity, the next step is to test the products as delivered from the machine. The weight of washed coal and refuse as related to weight of raw coal should be determined, and then a sink-and-float test of the washed coal and the refuse made in a solution of the standard specific gravity. Table IV shows tabulated results of such tests. From Table III it will be seen that the raw coal has a purity of 72.16 per cent, if all material at or under 1.35 specific gravity be termed pure coal. The purity may, therefore, be raised 27.84 points in a perfect separation.

The washed coal shows a purity of 83.8 per cent. The purity has been raised 11.64 points out of a possible 27.84. It could be said, then, that the "cleaning" process has been 11.64/27.84 × 100 or 41.80 per cent efficient. This is termed "qualitative efficiency" by Mr. Drakeley.

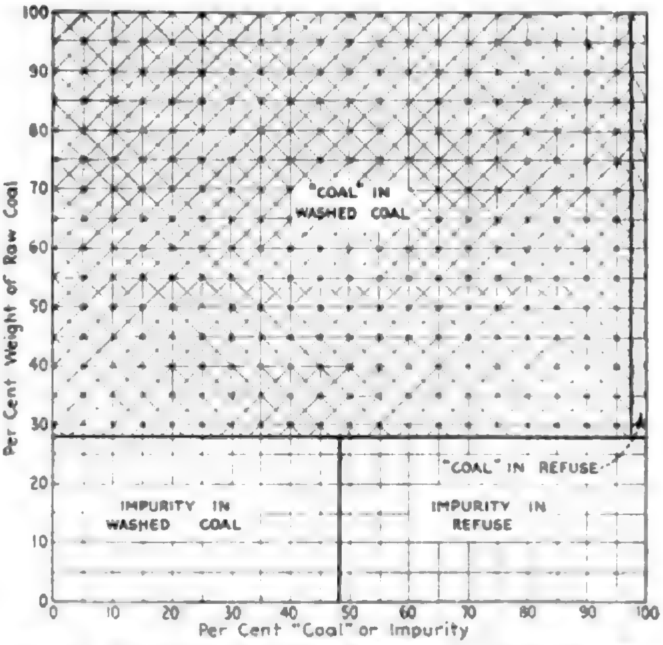


FIG. 3. GRAPHIC CHART SHOWING ALLOCATION OF "COAL" AND IMPURITY IN WASHED COAL AND REJECT

The impurity in the washed coal is not far different from that in the refuse but one is sweetened by 42.4 times as much "coal" as the other. Washed-coal float, 70.39 per cent; washed-coal sinkings, 13.61; refuse float, 1.66; refuse sinkings, 14.34. Total, 100.

This, however, does not deal with the percentage recovered. If all the pure coal or 72.16 per cent of the raw coal could be saved, the process would be 100 per cent efficient, as far as recovery is concerned. However, the washed coal contained only $\frac{83.8 \times 84}{100} = 70.4$ out of a total 72.16 per cent of pure coal, or the process was $\frac{70.4}{72.16} \times 100$ or 97.7 per cent efficient, as far as recovery was concerned. This is termed "quantitative efficiency."

As the object in washing was to be maximum elimination of impurity and maximum recovery, it would

TABLE IV—SINK-AND-FLOAT TEST ON WASHED COAL AND REFUSE

	Washed Coal	Refuse
Float	83.8	10.35
Sinkings	16.2	89.65
Percentage weight of raw coal	84.0	16.0

Percentage of raw coal that is washed-coal float $= \frac{84.0 \times 83.8}{100} = 70.39$

Percentage of raw coal that is refuse float $= \frac{16.0 \times 10.35}{100} = 1.66$

Percentage of total float in terms of raw coal $= 70.39 + 1.66 = 72.05$

Percentage of total washed-coal float to total float $= \frac{70.39}{72.05} \times 100 = 97.70$

Percentage of refuse float to total float $= \frac{1.66}{72.05} \times 100$, or $100 - 97.70 = 2.30$

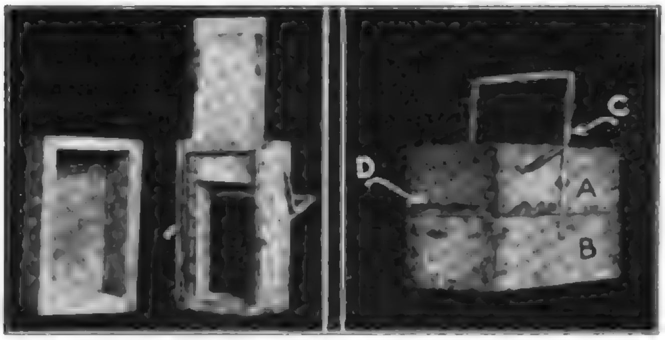
Percentage of raw coal that is washed-coal sinkings $= \frac{84.0 \times 16.2}{100} = 13.61$

Percentage of raw coal that is refuse sinkings $= \frac{16.0 \times 89.65}{100} = 14.34$

Percentage of total sinkings in terms of raw coal $= 13.61 + 14.34 = 27.95$

Percentage of washed-coal sinkings to total sinkings $= \frac{13.61}{27.95} \times 100 = 48.68$

Percentage of refuse sinkings to total sinkings $= \frac{14.34}{27.95} \times 100$, or $100 - 48.68 = 51.32$



FIGS. 4 AND 5. SINK-AND-FLOAT APPARATUS

A fixed 64-mesh screen in the bottom and a movable screen of the same fineness in the middle admit the solution when the apparatus is lowered into it and permit it to escape when the apparatus is removed.

be feasible to combine these results to show how near the process has come to attaining this result; 97.7 per cent of good coal was recovered, and it was improved 41.80 per cent in quality; therefore it might be said that the process came within $\frac{97.70 \times 41.80}{100} = 40.85$ per cent of fulfilling the ideal requirements. This is termed "general efficiency."

As stated above, an operator might not wish to separate his coal into two groups indicated by the curves. He might select the ash percentage that is allowable in his product and accept the corresponding recovery as that expected from his machine or plant. Having done this he might then infer that as long as the machine gives this recovery and the product contains no more ash than the limit set, it is 100 per cent efficient. Is this true? It is true that he may be getting a higher yield than he would if he cleaned the coal nearer to the ash content indicated by the curve and still have a product within the limits demanded. It might be feasible, however, to run the machine so as to approach more nearly to the ideal separation, and then, if he wished, dilute the washed coal with raw coal till the ash limit was reached, thereby giving his entire plant a greater output with the same number of machines. If this proved successful, the machines certainly were not running at 100 per cent efficiency in the first case.

G. R. Delamater[3] describes a chart originated by Dr. Hancock, by which the results of the above tests may be shown graphically. A square is drawn on co-ordinate paper. The left side and bottom are each divided into divisions representing percentages. The percentage of raw coal that sank in the standard solution is laid off on the left side, and through this point a horizontal line is drawn, dividing the square into two areas. This line is marked with the specific gravity of the standard solution.

The upper area represents the amount of good "coal" in the raw coal, and the lower the amount of impurities in the raw coal. Next, the percentages of total impurity found in the washed coal and of total "coal" found in the washed coal are laid off on the standard solution line. Vertical lines are then drawn from the first point down to the bottom of the chart and from the second point to the top of the chart.

These will divide the square into four areas, which represent "coal" in washed coal, "coal" in refuse, impurity in washed coal, and impurity in refuse. By coloring or cross hatching these in different manners, the chart shows at a glance the type of work being done by the machines or plant.

There are several ways in which the sink-and-float test may be made. I prefer to use a zinc-chloride solution and the type of apparatus shown, which is a modification of an apparatus suggested by Mr. Drakeley. It consists of two boxes, *A* and *B* (see Figs. 4 and 5), of the same size, 8 x 4 x 3 in. *A* has for its bottom a sliding screen (60-mesh), while *B* has a fixed screen bottom (60-mesh); *A* has a projecting guide at the bottom which fits into the top of *B*, and the handle *C* is so made as to lock the two together when brought to an upright position.

To carry on the test the boxes are locked together, the screen pulled out and the boxes submerged in the solution. A 300-gram sample is then dumped into *A*. The sample is stirred for 10 minutes so that all particles are thoroughly wetted, and then allowed to settle for 20 minutes. The screen *D* is inserted, the boxes lifted out and the solution allowed to drain out. The boxes are then separated and placed under a warm-water spigot. The sinkings will, of course, be in box *B* and the float in box *A*. The apparatus is very simple, easy to use, and saves much time and trouble.

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[3] Coal Age, May 2, 1914.

Use Two Safety Valves on Boilers, Though These Devices Have Their Dangers*

By Warren Hilleary†

Boston, Mass.

PROVIDE at least two safety valves on every steam boiler, for the reason that if only one valve is installed it may fail when needed. It is evident that if there are two or more safety valves there will be less likelihood of excess pressure being raised on the boiler than if only one is used.

Whether the valves should be mounted on a "Y" or other base, the single outlet of which connects with the boiler, has been frequently debated, and apparently there is no objection to this provision.

A means should be provided for lifting the valve disk from the seat for testing purposes. This should be so readily accessible that the attendant can open the safety valve while the boiler is under pressure, without danger of being burned by contact with hot parts, without having to grope about for a cord or lever, without climbing a ladder, and, preferably, from a point where the pressure-gage and the water-gage glass can be viewed while the disk is being held off its seat, for in operating practice it too frequently occurs that the boilers are being worked beyond normal rated capacity, and if the water chances to be quite high in the boiler, the lifting of the disk when the gage pressure is up to within a pound or two of the blowing point may cause water to be carried into the steam line. If both the pressure gage and the water-gage glass are visible from the point from which the disk is raised, the action of the water in the glass often will indicate to the attendant whether the disk should be instantly dropped or whether it is safe to hold it open for a few seconds.

The discharge outlets of the safety valves should, of course, be so arranged that there will be no likelihood that any person will be scalded or have dust blown into his face and eyes when the safety valves open, but it is not desirable that the outlet be piped further than absolutely necessary. The piping should be as straight

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*Excerpt from a paper entitled "Safety Features of Steam Boiler Accessories," read before Engineering Section, National Safety Council, and the Philadelphia Branch of the American Society of Mechanical Engineers.

†Superintendent, Royal Indemnity Co.

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as possible and no more than one bend or elbow should be allowed in the line, and this angle in the pipe should have at least a one-inch free drain at the lowest point unless the discharge outlet is less than one inch. In that case the drain need not be so large. Cases are on record where persons have been scalded by the discharge from the safety valve and also where severe injuries to eyes have been caused by dust being blown from the tops of the boilers into the eyes of attendants.

In some plants a ¾-in. pop valve is installed on each boiler. This valve is set to blow off at pressures 2 or 3 lb. lower than will actuate the main safety valves. The blowing of this pilot valve, which makes much noise, will warn the attendants that the main valves are about to blow, and it might be a good idea to place these pilot safety valves on every boiler, for the expense is not great, and it is advantageous to know when the main valves are about to blow.

An Alloy That Resists High Temperatures

CALITE is a new alloy that melts at 2,777 deg. F., softens at 2,500 deg., is safe to use at temperatures not exceeding 2,200 deg. and may be used at a temperature of 2,370 deg. without bad results. Its specific gravity is 7.03, its weight per cubic inch is 0.25 lb., its specific heat is 0.123, its thermal conductivity is one-quarter that of iron and in cooling from molten to cold it shrinks ¼ in. per foot. The elastic limit is 36,800 lb. with a reduction of area of 2 to 3 per cent and an elongation of 1 per cent.

The Brinell hardness (annealed) is 286 and the scleroscope hardness (annealed) 40. The transverse strain test showed that a 1-in. square bar on supports at 12-in. centers broke at 4,250 lb. Calite containers are used for carbonizing or case hardening, annealing, heat treating and for holding molten lead, salts and cyanides. It also is adaptable for furnace parts, heat exchangers and recuperators.

Calite can be cast into boxes, retorts, pots and other containers for antimony, babbitt metal, pure copper, lead, tin, type metal, calcium chloride, sodium chloride, potassium chloride, barium chloride, nitrates, cyanides, case-hardening compounds, carbonizing compounds, sodium carbonate and acetic acid. It may be used in the presence of ammonium-chloride fumes, sulphur vapors and saturated sea-salt vapor. The Calorizing Co. of Pittsburgh is the manufacturer.

Beware of Even Low-Voltage Current*

By S. E. Whiting†
Boston, Mass.

SKEPTICS will tell you that if a man does not have a weak heart he will not be injured by a low-voltage current, but this is no excuse for such accidents, for we have no license to kill the weak-hearted. The action may sometimes be a paralysis of certain nerves, causing a suspension of breathing and sometimes an interference of heart action. Again death may come from inhaling the poisonous fumes from a flash of current.

The susceptibility of individuals varies. One authority has gone so far as to give the figure 100 milliamperes as the minimum current that will prove fatal. However, Dr. Cannon, of Harvard, chairman of the National Commission on Resuscitation from Electric Shock, recently told me that a more important factor than the quantity of current is the path which it takes through the body. He has found that different physical effects are produced in different shock cases, and he emphasizes the importance, regardless of all other considerations, of immediately applying artificial respiration in every case where the breathing stops.

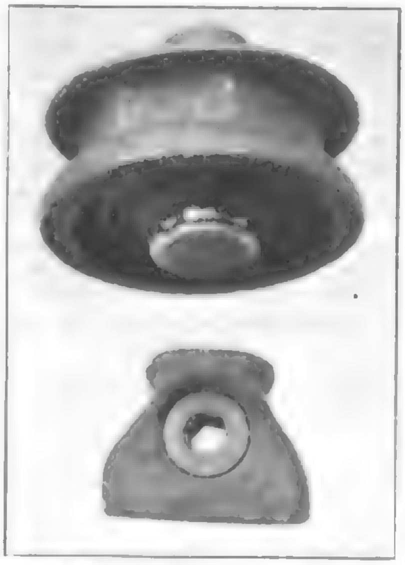
Indications are that some shocks cause immediate suspension of breathing with the heart continuing to beat. Other shocks first cause only a dazed condition, with collapse occurring some minutes later. Others show no suspension of animation at all, but death occurs days later from extensive burns, particularly in high-voltage cases. Some cases show small skin burns or punctures due to localized contacts of the body with the live parts of the circuit; others show no external evidence that the man has been subjected to shock, yet the attendant condition as to position of the body and charge on the apparatus made it certain that a shock had been received.

Your claim department may argue in a particular fatality that electric shock is not the cause, as no burns can be found on the body. Personally I believe it is quite possible to pass a fatal current through a man without causing any surface marks whatever. The only essential is that the body contacts be of large area and firmly made, as happens when a metal switch handle is gripped and the feet of the victim are in water.

One Screw Holds Clamp to Both Hanger and Wire, Making Short and Easy Suspension

THE General Electric Co. has recently developed a form of combination clamp and hanger especially designed for use on mine trolley lines, where the saving of headroom is of great importance. Not only is it easier to install but it is less expensive and saves half an inch in headroom.

It consists of two parts, the suspension and the clamp. The suspensions resemble those formerly manufactured as standard by the company, with the difference that the threaded stud is replaced by one with a button head. The clamp fits directly over the button head of the stud and is held by tension, having a groove that matches the flange on the stud. The same screw that holds the clamp to the wire also holds it to the stud of the suspension. The gain in headroom is obtained by the elimination of the nut that was formerly necessary to fasten the ear to the suspension. The device then is easier to install.



DISASSEMBLED SUSPENSION AND CLAMP

The top of the clamp fits over the button-head stud of the hanger much as the lower part fits over the wire, and one screw holds them both.

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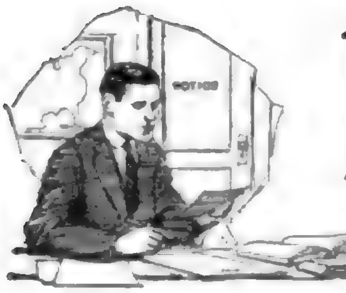
*Excerpt from article entitled "Lessons Learned from Forty Electrical Fatalities," read before the Engineering Section of the National Safety Council and the Philadelphia Branch of the American Society of Mechanical Engineers.

†Assistant chief engineer, Liberty Mutual Life Insurance Co.



Problems of Operating Men

Edited by James T. Beard

Two Important Questions in Ventilation

Abandoned Places Not to Be Sealed Off—Ventilate Such Places by a Scale of Air—Run Fan Continuously to Avoid Danger of Dust and Gas—Remove Dust and Sprinkle Roadways Once a Week

PERMIT me to refer to two interesting questions relating to mine ventilation, which were presented for discussion at a recent meeting of the Coal Mining Institute of America and reported in *Coal Age*, Nov. 3, p. 734. The questions read as follows:

1. "When a section of a mine is entirely worked out and abandoned would it be proper to seal off the section or should it be ventilated?"

2. "In a mine in which firedamp has never been detected and which is worked entirely by open lights but in which only permissible explosives are used on account of the dryness of the dust, should the ventilating fan be run continuously or should it be stopped on Sundays, holidays or idle days?"

DANGER IN SEALING OFF A SECTION

In answer to the first question, let me say that, under no conditions could an abandoned part of a mine be sealed off. In my opinion, this is a very dangerous practice, owing to the liability of the accumulation of gas in such places that would be void of ventilation when sealed.

Experience teaches that the gases, which always accumulate in poorly ventilated places, are chiefly carbon monoxide (CO) and carbon dioxide (CO_2). As is well known, the first of these two gases is extremely poisonous.

In a dry and dusty mine, the cutting off of the air by sealing an abandoned section would be liable to start slow combustion in the gob, owing to the resulting increase in temperature, particularly if moisture is present in the workings. Under such conditions, large quantities of carbon monoxide would be produced, because of the limited supply of air.

EXPLOSION MAY RESULT WHERE GAS IS PRESENT

This gas is not only poisonous but inflammable. The danger is much increased if any considerable portion of methane or marsh gas is being given off from the roof or floor. The ignition of the gas from any cause would result in an explosion, as there is always sufficient free air within the sealed portion to make that possible.

Should the roof be a hard sandstone and a fall of rock take place, it is possible for sparks to be struck and ignite the gas, which has been shown to have occurred in some instances, I believe.

Again, it may happen that the operator has in mind the purchase of adjoining property when the headings reach the property line. In that case, large abandoned areas sealed off would prove a serious menace to safety, in the later development of the mine.

It is practically impossible to seal off large areas so that air and gases will not pass in and out through the seals and crevices in the seam and enclosing strata. Where the intake air current is carried past such abandoned sections that are sealed it generally becomes foul before reaching the live workings.

My conclusion is that it is highly unsafe to seal off large abandoned areas. Instead, they should be ventilated by a sufficient scale of air to prevent the accumulation of gases within the section. This has been my practice and I regard it as a safe one to follow.

SAFETY REQUIRES A VENTILATING FAN TO BE RUN CONTINUOUSLY

The second question, regarding the stopping of the ventilating fan on Sundays, holidays or at other idle times is a practical one and well worthy of discussion. It is stated that, in this case, the mine is worked by open lights.

In my judgment, a ventilating fan should be run continuously, day and night. One reason for so doing is to avoid the increase in temperature in the mine that always occurs when the fan is stopped. Then, it will not be long, particularly in a large mine, for dangerous quantities of gas to accumulate in the workings.

It is a common thing, in mining practice, for many rooms being driven to be poorly ventilated. Some are driven too far ahead of the air, or the breakthroughs are small and little air reaches the working faces. These conditions favor the accumulation of blackdamp and other gases, which take time to remove, after the ventilating current is restored.

It will generally be found that more time will be required to restore the air in these places and make them fit for work, and the cost will be greater than to keep the fan running continuously at a speed sufficient to prevent the accumulation of gas.

Again, there is always the possibility of a sudden breakdown of the fan ventilating a mine. The operator will be fortunate if this does not occur at a time when he is striving to clear the mine of gas that has accumulated during an idle period. Only in exceptional cases, where the mine is not dry and dusty, would I consider it safe to shut down the fan on Sundays, holidays and other idle times.

———, Tenn. MINE FOREMAN.

Alabama Law re Gaseous Mines

Important points relating to gassy mines not mentioned in the Alabama law—Pennsylvania law discriminates clearly between mines that do and those that do not generate gas.

READING the last paragraph (c), in the answer to the second examination question in *Coal Age*, Nov. 10, p. 769, I was surprised to find that several important points appear to be omitted in the Alabama law relating to mines generating gas.

The portion of the question to which I refer reads as follows: "Does it (the Alabama Mining Law) discriminate between gaseous and non-gaseous mines?" This question was asked at a recent first-class, mine foremen's examination, held at Birmingham last July.

The answer to this part of the question names three sections of the mine law that discriminate between mines generating gas and those free from gas. The requirements mentioned in these three sections are the following:

WHAT THE LAW REQUIRES IN RESPECT TO MINES GENERATING GAS

Sec. 27, requires that the mine foreman in charge of a gaseous mine shall hold a first-class certificate. Sec. 30, specifies that the mine shall be sprayed or sprinkled; and Sec. 32, requires the employment, in such mines, of a competent fireboss and specifies his duties.

The section states that the fireboss shall examine every working place, in the morning, before the men are permitted to enter for work, and inform each man in whose place he may have found a dangerous quantity of gas, telling him of the condition of his place.

It states, further, that the examination shall be made by the fireboss every morning, using a safety lamp for that purpose. The fireboss is required to leave a conspicuous sign or mark at the neck of each room and at a point 25 ft. distant from the face of each slope, drift or heading where gas is found in dangerous quantities.

What is strange to me is that this should be the extent to which the Alabama mining law discriminates between gaseous and non-gaseous mines. I fail to understand how an examination fulfilling these requirements would make known the true condition of a working place.

First, no time is specified for the examination to begin, which may be from two-and-one-half to three hours previous to the men going to work. Neither is any mention made of the mark that the fireboss should leave at the face of each place examined, as evidence of his presence in the place that morning.

Finding gas in a place, the law requires the fireboss to leave a conspicuous mark or sign at the neck of a room, or at a point 25 ft. back from the face of a heading. Granting that this requirement will sufficiently warn a miner working in a room where gas has been found, let me ask, What about the entry or heading that is generating gas in dangerous quantity?

Warning Insufficient in Headings

The entryman, hurrying to his work, looks for the mark, if he gets that far, which the fireboss is directed to leave 25 ft. back from the face. Two-and-one-half hours before, the fireboss found gas at the face of this heading. Will any one deny that the chances are good for the miner's open light to haye ignited this gas at a distance of 40 or 50 ft. from the face, when he was approaching for work?

What appeals to me is the absence of any measure of safety provided by this requirement in the Alabama law. Moreover, does not the law require the fireboss to look for other dangers than gas, in each working place he examines, and report the same and hold back the checks of the men working in such places where danger is found?

Allow me to contrast this feature of the Alabama law with the like requirement in the Pennsylvania bituminous law, which makes the presence of gas, in dangerous quantity, depend on the gas being detected on the flame of an approved safety lamp, and requires that such places shall be worked with locked safety lamps.

No one will deny that this is a precaution that insures safety. If the fireboss has found gas in a place, the man working the place is not permitted to proceed to work, until the gas has been removed and the place made safe.

Gans, Pa. R. W. LIGHTBURN.

Do Years Make Safe Workers?

Experience seems to breed indifference to danger — Man who thinks he "knows it all" is obstinate and difficult to handle.

TO THE QUERY contained in the headline I answer an unequivocal "No." The longer a miner works underground the less he thinks of the danger surrounding him and the more difficult it becomes to instill into him the need of carefulness.

This does not apply to all classes of miners, but some have an idea that they "know it all." A person can tell them one thing and when he is gone they will do the exact contrary. A green man, on the other hand, can be made a good miner if the foreman explains to him carefully the work he is expected to do. In time he will become an excellent miner.

I think that in most mines a master miner should be employed who understands all phases of coal getting. This is not needed except in an operation where few skilled miners are to be found and where most of the workmen come out of the shop or from the farm.

Rawdon, Quebec. C. McMANIMAN.

Where Mining Laws Fail

Many weak points in our state mining laws—Integrity of examining boards a controlling factor—Law providing for their appointment — Uncertified foremen to serve until next board meets.

BEING a firm believer in the certification of mine officials, like many others, no doubt, I have been impressed with the excellent letter of John Wall, Sr., *Coal Age,* Nov. 17, p. 807, bearing on the value of the certificate law.

If any one has any misgivings as to the practical value of that law in the operation of coal mines he needs but to refer to the citation of its history in Pennsylvania, as outlined by Mr. Wall, whose dates and figures show clearly what has been accomplished in Pennsylvania.

What the Law Has Accomplished in Other States

Like facts could be shown in respect to every coal-mining state where certification has been made a law. Every state has had its share of mine disasters; and a comparison of those that occurred before, with those following the enactment of the law requiring the certification of mine officials, will prove the value of that law in each instance. Pennsylvania does not stand alone in that regard.

In our own state of Colorado we have been pleased to note that mine disasters have been materially decreased, we might almost say, eliminated, through the strict observance of the requirements of the new law and the constant, thorough inspection and supervision of all work by the officials in charge.

It is with some hesitancy that I offer a few suggestions on points essential to the safeguarding of mining operations. Many or perhaps all of these points have been mentioned, at different times, in *Coal Age;* but I will briefly outline some of these as they recur to my mind.

Integrity of State Examining Boards Important Factor

First in order is the integrity of our examining boards. For this we must depend almost wholly on the personal honesty of the individual members of these boards. Of course, it is understood that immediately following the organization of a board, each member takes a solemn oath before a duly authorized officer, pledging himself to perform the duties of examiner to the best of his ability.

Every man on an examining board in recommending or rejecting the application of a candidate, is pledged to be governed solely by the evidence of the person's qualifications, under the law, and his fitness for the position he desires, without consideration of any political or personal prejudices.

Where the mining law requires the proper administering of such an oath to each board member, the result should insure the just and fair treatment of every candidate in the examination. But how many of our state mining laws make mention of the form of oath required to be taken by board members upon being duly appointed.

Appointment of Examining Boards Should Eliminate Politics

Let me say a word, here, as to the appointment of members of an examining board and suggest what appeals to me as an ideal method of appointment. I will assume the entire field is divided into three districts. At the proper time let the Governor notify a judge presiding in each district, asking two of them to appoint, from their respective districts, a reputable coal miner, if possible, selecting men who hold first-class certificates.

At the same time, in like manner, the third judge should be asked to select a mine owner or mine superintendent of good repute and standing, thus making three members to serve on the said board. The Governor himself should then choose a prominent coal-mining engineer as a fourth member of the board, while the chief mine inspector of the state would constitute a fifth member.

It seems to me that this method of appointment would remove the board as far as possible from political influence. Each member would be a coal-mining man and, let me add, it would be preferable to select each miner on the board from among those who hold certificates received at a previous examination.

The Law in Pennsylvania

In regard to the Pennsylvania law authorizing a mine superintendent to appoint an uncertified man as foreman, provided that, in the judgment of the superintendent, he has the same qualifications as a certified man, I would only say that the law should have restricted the service of such an uncertified foreman to the time of the holding of the next examination, when he should be compelled to get a certificate or give up his place as foreman.

To my mind, such a reading of the law would, in no way, impair the requirement of certification of foremen and other mine officials. I will say in closing that, since certification became a law in Colorado, all superintendents are looking for certified men, believing that they make better and safer foremen. ROBERT A. MARSHALL.

Walsenberg, Colo.

Certifying Mine Superintendents

What the Tennessee Mining Law requires of mine superintendents—Instance of certified officials at one large colliery—Limiting the life of certificates advocated.

SOME of the remarks made in the interesting letter of John Rose, former district mine inspector in Tennessee, which appeared in the issue of *Coal Age*, Oct. 27, p. 684, surprised me greatly. In addition to what I said in a previous letter urging the certification of mine superintendents, I want to offer a few comments on this subject.

I fully agree with Mr. Rose's statement that "the superintendent looks after the construction work of the entire operation, both outside and inside of the mine." On the other hand, I can hardly endorse his idea that the Tennessee mining law is lacking in its requirements regarding the qualifications of the chief mine inspector of the state.

CHIEF INSPECTOR'S QUALIFICATIONS REQUIRED IN TENNESSEE

True, the law does not stipulate that the chief mine inspector shall hold a "Class-A" mine-foreman's certificate, as is required of each district mine inspector. But the law does particularly specify the qualifications the chief mine inspector is required to possess, in the following terms:

> No person shall be appointed chief mine inspector, unless he is possessed of a competent knowledge of chemistry, geology and mineralogy of Tennessee, so far as these sciences relate to mining, and has a practical knowledge of mining engineering and the different systems of working and ventilating mines, and the nature and properties of the noxious poisonous and explosive gases found in the mines and the best means of preventing dangers and the removal of same, and shall have had ten years' experience in mining.

Under this law, the chief mine inspector of Tennessee is supposed to be a qualified man. I want to ask, How could it be known that a candidate for this position possesses the knowledge and the qualifications mentioned in the section of the law just quoted, unless this is proved by the examination of candidates for that office.

WHY ARE NOT MINE SUPERINTENDENTS CERTIFIED BY LAW?

In this connection, allow me to state that if the law recognizes the need of qualified mine inspectors and requires their certification and (Sec. 12) the certification of mine foremen, assistant foremen and firebosses in the state, why does not the law require a like certification of mine superintendents, who oversee and direct the work of mine foremen?

Speaking of an uncertified superintendent giving orders to a certified foreman that, if carried out, would endanger life, Mr. Rose says he sees "nothing to hinder the foreman from disobeying such orders."

No one will deny that a mine foreman, in spite of his experience being in conflict with the orders of the superintendent, will carry out those orders or get off the job. Many an experienced foreman, under such circumstances, has resigned and gone home rather than be responsible for doing what his experience tells him would endanger the lives of men working in the mine.

QUALIFIED MEN AT ONE LARGE COLLIERY

Just here, let me cite one instance of a large coal operation, in Tennessee, where the general manager, the mine superintendent and the mine foreman are all holders of "Class-A," mine-foreman certificates. The daily output of the mine exceeds 1,000 tons and safety-first is practiced in every branch of the work.

Before closing, I want to endorse the suggestion of Mr. Rose regarding the limitation of the life of all certificates. I would say the life of a certificate should not exceed four years, which is the length of time prescribed by law for the term of office of the chief mine inspector.

To my mind, it would be well to do away with the issuing of "Class-C" and "Class-B" certificates. In my opinion, all mine foremen and assistant foremen should have a full knowledge of mine gases and understand their danger and behavior in the mine, since gas is liable to be generated, at any time, in a mine classified as "non-gaseous."

I want to urge again the need of examining and certifying all mine superintendents, who are worthy of no greater consideration than mine foremen by reason of their higher office and who are, in the end, responsible for what is done in the mine.

OSCAR H. JONES.

Crawford, Tenn.

Inquiries Of General Interest

Best Method of Sinking a Shaft

Shallow Shaft Sunk from Surface—Method Safer, More Economical and Better Than Driving an Upraise from the Mine Below

IN order to provide better ventilation in our mine, it has become necessary to sink an airshaft. The depth from the surface, at the point where it is proposed to sink this shaft, is only 70 ft. The coal is overlaid with six feet of slate, above which are four feet of sandrock, the remaining strata being alternate clay and shale covered with a few feet of drift. It has been suggested that, for one or two reasons, it would be better to drive an upraise from the mine, instead of sinking the shaft from the surface.

First, it will be necessary to locate the point on the surface that will be directly above the desired location in the mine. Second, in driving an upraise, the material excavated can be dropped into the mine and there utilized for building stoppings or stowed in the waste. In addition, there will be the saving of the expense for hoisting the excavated material and for draining the shaft by pumping.

These advantages have appealed to us and we are writing this hoping to receive the advice and suggestions of *Coal Age* and its many practical readers. SUPERINTENDENT.

——, Pa.

There is no question but that the points named by this correspondent are an advantage, in the driving of an upraise, over the usual plan of sinking a shaft from the surface. On the other hand, when the need of employing men who have had experience in such work, and the increased danger to the workmen are considered, many will decide in favor of sinking this shallow shaft from the surface and will adopt such plan, unless there are particular reasons for doing otherwise.

If a shaft is to be sunk from the surface the safest plan, in order to avoid any error in location, is to sink one or more drillholes on the proposed site. The position of these holes in the mine will enable an accurate location to be made on the surface. Again, a drillhole in the shaft, if kept clear, will afford ample means of drainage and avoid the necessity of pumping, during the time of sinking.

It will often happen that the cost of handling the excavated material, in driving an upraise and stowing it away in the waste places in the mine, will overbalance the cost of hoisting the same material to the surface, in sinking the shaft and dumping it in the usual manner. Expense for draining the shaft is obviated by the drillhole.

Taking everything into consideration, we think that the sinking of a shallow shaft from the surface will not only be safer, but prove more economical and quicker, in the end, than to attempt to drive an upraise from the mine. In driving an upraise trouble increases where the strata are soft and not self supporting. In the present case, there are but ten feet of slate and sandrock, the remaining sixty feet being material that is not self-supporting, under general conditions. We shall be glad to receive the suggestions and advice of practical miners, on these points.

Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

QUESTION—*If a breast is driven a distance of 500 ft. on a rising grade of 10 per cent, what vertical height has the breast attained above the gangway level and what should be the distance represented on the mine map?*

ANSWER—The distance of 500 ft. is assumed, in this case, to be measured on the pitch. The vertical rise, for a grade of 10 per cent, may be estimated as one-tenth of the pitch distance or 50 ft. The corresponding horizontal distance is $\sqrt{500^2 - 50^2} = \sqrt{247{,}500} = 497.5$ ft., which is the distance represented on the mine map. If the map is drawn to a scale of 100 ft. to the inch, the measurement on the map is 4.975 inches.

QUESTION — *Why are permissible powders safer than black powders?*

ANSWER—Permissible powders are safer than black powders for at least two reasons: 1. A smaller charge of the powder suffices to do the same work. 2. Permissible powders are practically flameless.

QUESTION—*To light a mine with 200 lamps of 16 cp. each, what amount of mechanical energy would have to be available for conversion into electricity?*

ANSWER—A 16-cp. lamp may be assumed to consume from 50 to 56 watts of energy. Estimating on the maximum amount, the total electrical energy required would be 200 × 56 = 11,200 watts. The efficiency of the dynamo may be taken as 90 per cent and, since 1 hp. is equivalent to 746 watts, the power transmitted by the belt driving the dynamo is

$$H = \frac{11{,}200}{0.90 \times 746} = 16.68 \textit{ hp.}$$

Now, assuming the efficiency of the engine driving the dynamo as 85 per cent, the total indicated horsepower (i.hp.) is

$$I.\ hp. = \frac{16.68}{0.85} = 19.62, \text{ say } 20 \textit{ hp.}$$

QUESTION—*A siphon has its short leg, 10 ft. vertical, and long leg, 20 ft. vertical, and is 6 in. in diameter, with a total length of 100 yd. Find the flow, in gallons per hour, allowing for frictional resistance.*

ANSWER—It is never safe to calculate the discharge of a siphon without first ascertaining whether conditions are such that it will run dry, or in other words tend to empty itself, which will always be the case if the flow of water in the short leg, under atmospheric pressure, is less than the discharge in the long leg, under gravity. At sea level, the water column supported by the atmospheric pressure is practically 34 ft.; and, assuming that the short leg, in this case, is 100 ft. long and the long leg, say 200 ft. long and the uniform diameter of the pipe, 6 in., the relative flow in each leg of the siphon, calculated independently, is as follows:

Short leg,

$$\frac{34 - 10}{2.08 \times 6 + 100} = \frac{24}{112.48} = 0.213$$

Long leg,

$$\frac{20 - 10}{2.08 \times 6 + 200} = \frac{10}{212.48} = 0.047$$

The flow in the shorter leg being the greater of the two, there is, therefore, no danger of this siphon running dry.

The discharge of a 6-in. siphon 300 ft. long, having a rise of 10 ft. and a fall of 20 ft., is calculated thus:

$$G = 6^2 \sqrt{\frac{800 \times 6(20 - 10)}{2.08 \times 6 + 300}}$$

$$= 36 \sqrt{\frac{48{,}000}{312.48}} = 446.18 \textit{ gal. per min.}$$

The discharge of this siphon is, therefore, 60 × 446.18 = say 26,770 gal. per hr. It is important that both ends of the siphon be submerged and that an air trap be provided at the crown or summit to collect the air given up by the water.

QUESTION—*Describe your course of action, as mine foreman, to comply with the state mining law, in case a fatal accident occurred in the mine under your charge.*

ANSWER—The duty of the mine foreman is to notify the superintendent or operator, who must, within twenty-four hours of the time of the accident, report the same to the chief of the Department of Mines and to the district mine inspector, giving full details in writing on the printed forms furnished by the Department of Mines (Sec. 83).

QUESTION — *As mine foreman at a gaseous mine, what instructions would you give to your firebosses relative to the performance of their duties and how would you ascertain whether or not your instructions had been obeyed?*

ANSWER—The foreman of a gassy mine must know that each fireboss he employs is competent and conscientious in the performance of his work. Each fireboss should be instructed to be at the mine, at least fifteen or twenty minutes before the time for him to begin his inspection, in order to enable him to properly examine and prepare his lamp, ascertain the condition of the ventilating apparatus, note the barometer reading and feel assured that there are no unusual conditions prevailing in the mine, as far as this can be ascertained from the surface.

On entering the mine, each fireboss should proceed to his own district and make a careful examination of every working place, by following the air current, making careful tests with his lamp as he proceeds. He should be instructed, also, to note any other dangers than gas, in each place examined, and to place the necessary danger signals where danger is found. Finally, on returning to the bottom or entrance to the mine, each fireboss must make out a full report, stating what dangers, if any, he has found, giving the location and nature of each and withholding the checks of the men working in such places.

By closely observing the conditions when making his own rounds of the mine and by carefully reading the reports of each fireboss, the mine foreman should be able to tell whether or not his instructions are obeyed.

QUESTION—*A certain mine has been abandoned and the adjoining mine is working towards the abandoned workings. State fully what you, as foreman, would do to safeguard the men under your charge and comply with the mining law of West Virginia.*

ANSWER—As far as possible, the abandoned mine should be explored in the region lying next to the live workings that are approaching it. Where that is possible a careful survey should be made of the coal face and the survey plotted on the present mine map. However, no reliance should be placed on any surveys; but advance headings should be driven toward the abandoned workings. These headings should be driven not over 8 ft. in width and protected by one borehole, kept 8 or 10 yd. in advance of the face, and other holes drilled in each rib and making an angle of 45 deg. with the entry. These flankholes should not be less than 18 or 20 ft. in depth. Only safety lamps should be used in driving these headings and wooden plugs should be kept ready for instant use in case a borehole strikes through into the abandoned works.

QUESTION — *(a) What precautions would you adopt to reduce to a minimum the production and distribution of coal dust in a coal mine? (b) What are the duties of a mine foreman regarding dry and dusty conditions?*

ANSWER—(a) Use permissible powders and make every effort to avoid shattering the coal by overcharging the hole in blasting. See that every shot is undermined and sidecut or both. In machine mining, load out all bug-dust and fine coal. Use dust-proof cars and avoid overloading them. Have all roads cleaned regularly.

(b) Make and enforce strict regulations in regard to cleaning up the roads and working places, sprinkling and spraying them at regular short intervals and adopting means to humidify the air throughout the mine. Employ shotfirers to examine, charge and fire all shots that in their judgment are safe.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THE real basis for confidence in the course of business in 1922 is now clear, according to a review of business conditions by *Commerce Monthly* for February. "Notwithstanding the severe depression during the past year," the review continues, "purchases by the American people in terms of physical volume were sufficient to absorb to a large extent accumulated stocks so that a gradual increase in output of many classes of manufactures may be expected. Future needs must be supplied primarily from current production. This means greater business activity and explains the expansion in manufactures which has taken place in recent weeks.

"The general tone of business during the first two weeks of January has been encouraging. The total physical volume of retail trade is good. Necessities are selling much better than are luxuries.

"Unemployment is unquestionably widespread, but probably its extent has been somewhat overestimated. Special measures undertaken to lessen it, particularly public works, are doing much to alleviate its worst features. The major part of the production energy of the country is absorbed in clothing, feeding and sheltering the population.

"Railroads have made notable gains in economy of operation, and improved credit conditions have definitely bettered their outlook, although traffic is at present disappointing in volume. The heavy decline in tonnage, serious as it has been, has primarily been the result of lessened shipments of coal, iron ore and similar heavy commodities. Reasonable buying of rails, cars, locomotives and other equipment may be expected during the current year.

"The year opens with promise of active building construction. Labor has not been liquidated and building costs therefore are still far above prewar levels, and are out of line with prices generally. This condition operates especially against building and construction for production of income, but not so heavily against individual enterprises for personal occupancy, or public buildings and public works. Consequently the field of residence building and public construction offers the greatest promise."

Freight Loadings Gain 114,885 Cars

Loadings of revenue freight during the week ended Jan. 14 totaled 720,877 cars, according to the American Railway Association. This was an increase of 114,885 cars over the week before, which was, however, a holiday week owing to the observance of New Year's day. The total was an increase of 5,022 cars over the corresponding week in 1921 but 119,647 cars less than the corresponding week in 1920. Coal loading showed an increase of 22,263 cars over the previous week, the total being 159,245 but this was 23,551 cars less than during the same week last year.

On Jan. 15 there were 593,298 freight cars idle, compared with 646,673 on Jan. 8, or a reduction within that time of 53,375 cars. Surplus coal cars amounted to 195,284 or a reduction of 24,160 within the week.

D., L. & W. Shops Resume Work

Approximately three thousand men employed in shops at the Delaware, Lackawanna & Western Railroad Co. in Scranton, Kingston and East Buffalo, N. Y., have resumed work after being idle three weeks.

Smith & Wesson Plant Reopens

Employees of Smith & Wesson, pistol manufacturers, Springfield, Mass., returned to work Monday, Jan. 16, when a wage reduction of 20 per cent went into effect. The plant had been closed since last July owing to business conditions.

Better Times for Anthracite Region

The Pennsylvania State Employment Bureau, a division of the State Department of Labor and Industry, sees better days ahead for the anthracite coal industry. Its report for Jan. 15 shows 315,000 unemployed persons in the State. The report of the bureau on conditions in the Scranton district is as follows: "With the return to work of the striking miners at several collieries of the Lehigh Valley Coal Co. in Luzerne and Lackawanna counties industrial peace reigns once more throughout the district. This settlement affects approximately 12,000 men. The increased demand for domestic sizes of anthracite coal seems to indicate that a better day is at hand."

New Darco Plant for Texas

The Atlas Powder Co. has begun construction work on a new plant for the Darco Corporation at Marshall, Texas, according to an announcement by W. J. Webster, president of the company. The new plant is designed to have an annual capacity of 6,000 tons of Darco, a carbon for use in refining and purifying sugar, edible oils, lactose, maltose, gelatine, drugs and chemicals.

Obtains Big Powder Contract

The Du Pont Powder Co. announces that it has received a contract from the Argentina government for a million pounds of military smokeless powder. This contract will be filled at Carney's Point, N. J., and will keep the plant busy for about six months.

Hoover Sees Business Gain

Indications of improved business conditions throughout the country were declared Jan. 23 by Secretary Hoover to be evidenced in the increased orders for equipment being placed by the railroads. The railroads, Mr. Hoover said, report that their inventories of 1920 and during government control have been practically worked off and they must assume the purchasing of equipment. This, he declared, was a healthy sign from a manufacturing point of view.

The Illinois Central R.R has placed orders for 2,100 all steel freight cars. The Haskell-Barker Co. received 700, the American Car & Foundry Co. and the Standard Steel Car Co. 500 each, and the Western Steel Car & Foundry Co. 400. The Illinois Central Railroad also has placed orders for 2,000 gondola cars. The Seaboard Air Line greeted the new year with an order for 1,500 to 2,000 cars. Orders for additional freight cars are expected to be placed shortly by the Chicago, Burlington & Quincy for about 7,000 cars.

Senator Kenyon Classifies Coal as a Public Utility

Makes Personal Report on West Virginia "War," Suggesting to Congress a National Industrial Code and a Federal Arbitration Board to Handle All Mine-Labor Controversies

COAL is a public utility and therefore its production and distribution should be conducted with the public's interest predominant. This is the conclusion upon which Senator William S. Kenyon, of Iowa, bases a striking report filed in the Senate on Friday, Jan. 27, in which he suggests an industrial code for the settlement of disputes in the mining industry and proposes that a federal board of three operators, three workmen and three representatives of the public adjudicate such disputes.

The report is an individual one made by the Senator following an investigation of the troublous West Virginia and Kentucky border region, where the "civil war" of 1920 and 1921 was fought over the issue of unionism. The investigation was made by a subcommittee of the Senate Committee on Education and Labor of which Senator Kenyon was chairman.

SENATOR WILLIAM S. KENYON

Incorporation of labor unions is urged in a minority report from the Labor Committee of the Senate. The report is signed by Senator Phipps, of Colorado; Senator Warren, of Wyoming, and Senator Sterling, of South Dakota. The practice of labor unions without legal responsibilities entering into contracts with operators who are bound by such agreements is un-American, the report states.

Senator Kenyon formulated his industrial code upon the basis of a "bill of rights" for both mine workers and employers, as shown on the next page. The complete industrial code which the Senator will give direction to whatever action Congress may take, follows:

1. Coal is a public utility and in its production and distribution the public interest is predominant.

2. Human standards should be the constraining influence in fixing the wages and working conditions of mine workers.

3. Capital prudently and honestly invested in the coal industry should have an adequate return sufficient to stimulate and accelerate the production of this essential commodity.

4. The right of operators and miners to organize is recognized and affirmed. This right shall not be denied, abridged, or interfered with in any manner whatsoever, nor shall coercive measures of any kind be used by employers or employees, or by their agents or representatives, to compel or to induce employers or employees to exercise or to refrain from exercising this right.

5. The right of operators and of miners to bargain collectively through representatives of their own choosing is recognized and affirmed.

6. The miners who are not members of a union have the right to work without being harassed by fellow workmen who may belong to unions. The men who belong to a union have the right to work without being harassed by operators who do not believe in unionism. The organizations have a right to go into non-union fields and by peaceable methods try to persuade men to join the unions, but they have no right to try and induce employees to violate contracts which they have entered into with their employers, and the operators on the other hand have the right by peaceable means to try to persuade men to refrain from joining the unions.

7. The right of all unskilled or common laborers to earn an adequate living wage sufficient to maintain the worker and his family in health and reasonable comfort, and to afford an opportunity for savings against unemployment, old age, and other contingencies is hereby declared and affirmed. Above this basic wage for unskilled workers, differentials in rates of pay for other mine workers shall be established for skill, experience, hazard of employment, and productive efficiency.

8. The right of women to engage in industrial occupations is recognized and affirmed; their rates of pay shall be the same as those of male workers for the same or equivalent service performed; they shall be accorded all the rights and guarantees granted to male workers and the conditions of their employment shall surround them with every safeguard of their health and strength and guarantee them the full measure of protection which is the debt of society to mothers and to potential mothers. Few women are engaged in any way in mining, but it may be as well to announce this proposition as to pass it by.

9. Children under the age of 16 years shall not be employed in the industry unless permits have been issued under state authority.

10. Six days shall be the standard work week in the industry with one day's rest in seven. The standard work day shall not consist of more than eight hours a day.

11. Punitive overtime shall be paid for hours worked each day in excess of the standard workday.

12. When a dispute or controversy arises between operators and mine workers, there should be no strike or lockout, pending a conference or a hearing and determination of the facts and principles involved.

Senator Kenyon's report covers 25 printed pages, the main part being devoted to argument for amicable settlement of industrial disputes. He reviews the issues between the operators and the unions in the controversy in which he defends the positions taken by each side, and condemns likewise unlawful practices alleged to have been performed by both. Neither operator nor union is spared from criticism.

"There is little use in reviewing the evidence or of entering into an elaborate discussion of the causes of the present industrial controversy in West Virginia," he says. "The issue is plain. The operators will not employ men belonging to the unions, as they believe they will become agitators. On the other hand the United Mine Workers of America are determined to unionize these fields, which are practically the only large and important coal fields in the United States not unionized. Thus we have a situation of two determined bodies trying to enforce what they believe are rights, which rights are diametrically opposed to one another—an irresistible force meeting an immovable body. In such case there can be nothing but trouble."

After stating the claims of the operators and unions as presented to the committee, the Senator adds:

"There have been violations of law on both sides of this controversy. There has been an arrogance upon both sides, seeming to indicate that, in the opinions of some of the leaders, the question was entirely one between the operators and the workers. Both sides have been forgetful of the great third party—the public—which has a vital interest in preserving industrial peace, especially in a region furnishing the percentage of coal that this region furnishes.

"If this matter is none of Congress's business, as is intimated in some of the briefs, then this committee should not have been appointed, but the intimation is merely a confirmation of the arrogance of those who assume that the public has no interest whatsoever in these matters. If it is no business of the National Government, then federal troops should not have been requested to preserve peace.

"A few particular things in the evidence perhaps should be referred to. A great deal is said in argument as to the change in the constitution of the United Mine Workers and substitution of the words relative to the mine workers of the 'full social value of their product,' sold and consumed,

EMPLOYERS' RIGHTS

As Proposed in Senator Kenyon's Industrial Code

They have a right to operate their plants on a non-union basis or on a union basis. They have the right to employ men whether those men belong to a union or not. They have the right to discharge men because they belong to a union or to discharge them because they do not belong to a union. They have the right not to employ men if they do not desire to do so.

They have no right to use force and violence to keep men out of a county who are there for the purpose of inducing men to join the union.

They have the right to protect their property. The fundamental of protection, however, should be upon the state. It is the duty of the state to protect the properties of the operators if anyone attempts to use force and violence against them. There is no right in public policy or public morals for the operators to pay the salaries of deputy sheriffs. The state police power and private police power cannot work together. The state cannot abdicate its function of protecting the public.

MINERS' RIGHTS

Under Senator Kenyon's Proposed Industrial Code

1. Men have the right to organize peaceably in trade unions and to bargain collectively through their chosen representatives. The exercise of their right to organize does not include coercive measures of any kind to induce persons to join their unions, nor to induce employers to bargain or deal therewith, nor to intimidate or harass non-union men associated with them.

2. While the right to strike now exists there is no right by violence or threats or interference to keep other men from taking the places of the strikers. They may peaceably dissuade men from taking their places.

3. Men who are not members of the union have a right to work without being harassed by fellow workmen who may belong to unions. Men who belong to unions have a right to work without being harassed by operators who do not believe in unionism. The miners have a right to go into non-union fields and by peaceable methods to try to persuade men to join the union, but they have no right to try to induce employees to violate contracts.

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in place of the words 'equitable share of the value of their product.' If this means, as is claimed by the operators, that the miners are claiming 'full social value' of the coal produced, leaving no compensation for property, of course, the same is indefensible and entirely un-American.

"It is rather unfortunate for the United Mine Workers that they adopted such a provision, which cannot receive the sanction of thoughtful men and women, and the explanation thereof has not been satisfactory."

The Senator thinks it is amazing that anyone would seek to defend the astounding situation of deputy sheriffs who are paid by operators performing general duties of deputy sheriffs and not merely defending the property of their employers.

He refrains from discussing the check-off system as questions involved therein are pending in the courts.

The Senator refers to the claim of the operators that the union intends to obtain a monopoly of the production of coal and to be in a position April 1 to stop industry and freeze people into acceding to their demands.

Referring to federal troops being sent into the region, to stop the famous march of the miners on Logan and Mingo counties, Senator Kenyon characterizes the march as "an indefensible performance." He says the whole story is one of disregard for and breaking of laws; of denials of constitutional rights; of a spirit of suspicion, hate and retaliation on both sides that does not augur well for industrial peace, and that there must be some change of feeling and some mutual concessions before peace will be re-established. He believes there must be some remedy under which the rights of both parties will be protected, and also those of the people, which are paramount.

"It is abhorrent to think that industrial troubles can only be settled by force, riot and bloodshed; that no basis can be established for adjustment of these difficulties," he adds. "Will not employers recognize the right of labor to a larger participation in the wealth which it creates? Will unionized labor not recognize the right of men to earn a living even though they do not belong to the unions?"

He believes a solution can be worked out along the lines of the President's message to Congress in December which will apply to disputes in basic industries. He denies that the President had in mind the proposed Kansas Industrial Court law.

The Senator says certain restrictions upon personal liberty, however regrettable in theory, must be imposed in practice in order that greater damage may not be done to the body politic.

He says the Kansas Industrial Court law cannot be a success because it had no underlying code of rules or principles which are regulatory or mandatory upon the court, and parties coming before it can invoke no bill of rights. He says the court is based upon a violation of previous experience, in this country and abroad, arising from legislation prohibiting strikes, and that it aims to solve a problem in human adjustments with an arbitrary, rigid and unrestricted judicial fiat. On the other hand the tribunal he advocates is based on a code of principles sanctioned by industrial usage.

He favors limiting the proposed industrial code to the mining industry in an effort to compose difficulties with equal and exact justice to capital, labor and the public, and that production may be stabilized and stimulated.

Senator Kenyon reviews the various futile efforts that have been made in this country during the past two years to project a new industrial code to be used as a basis for the settlement of industrial disputes. The Transportation Act of early 1920 enumerated seven principles for such a code and the Railroad Labor Board enunciated sixteen additional ones. Thus by action of Congress, supplemented by the Railroad Labor Board, a code of twenty-three fundamentals was laid down to govern in determining wages, working conditions and industrial relations for railroads. The Senator says this is exactly what Congress should do now for the coal industry.

He then discusses the legal aspects of the right of an employer to employ or discharge employees, quoting the decision of the Supreme Court in the Hitchman Coal & Coke Co. case. He says in this case the holding apparently is that the employer has a constitutional right to employ men who belong to a union but that there is a fair inference that this right may be modified by a proper exercise of the paramount police power.

This right, he believes, can be restricted by positive act of Congress, depending upon whether the public welfare required the principle of collective bargaining to be conceded to the workers as a legal right.

He refers to conflicting opinions in this regard, one group claiming that collective bargaining can be carried out only through the employees of the particular industry, and that the employees are not entitled to have agents representing them who are not members of the working force of the particular establishment. After quoting the operators and the President on the right of labor to organize he says "there is apparently some conflict between the two."

The Senator claims no originality or sanctity for his views, as they may be faulty, but he believes they offer some solution for the difficulties. He contends that Congress is economically impotent if it cannot devise some plan to bring about a better situation in industrial life. He has no pride of opinion in his views and would be glad to accept any other plan that might seem better. He will later introduce a bill covering the propositions laid down.

THE INDUSTRIAL MEDIUM now most needed is one that can make ghosts walk.—*Norfolk Virginian-Pilot.*

THE REASON BUSINESS CONDITIONS are unsettled is because so many accounts are.—*Elizabeth Journal.*

Most Industries Favor Lowering Coal Freights First, Also Urging Relatively Heavier Cuts

By Paul Wooton
Washington Correspondent of *Coal Age*

SINCE nearly every witness appearing before the Interstate Commerce Commission at the hearing on the proposed reduction of railroad freight rates is being asked what commodities should be favored in the matter of rate reduction, it is believed that the commission has in mind the application of different amounts of reductions even among basic commodities. This view is strengthened by the way in which testimony was developed to show that the relative increase in coal rates was much greater than in iron-ore rates.

In the majority of cases the witnesses would include coal among the commodities which should have the greatest reduction. Many witnesses have expressed the belief that coal should be favored to a greater extent than their own commodities. Nearly all the representatives of the iron and steel industry and associated activities expressed the opinion that it is more important to have a reduction in the rate on coal than on steel products. Other industries which ask that coal be included among the commodities favored are cement, roofing, asphalt, brick, building tile, paving brick, lime and glass. Even witnesses for the construction industry testified that building is being interfered with because of the high cost of coal. One of the lumber witnesses said coal should be favored before lumber. Most witnesses have suggested the removal of the 1920 increases.

During the past week it has become increasingly evident that the commission is determined to know where it is going before it authorizes any reduction. It is apparent that the members will take no chances and are not going to undertake an experiment with the rate structure. They are insisting on facts, and their questions indicate that reductions will be calculated carefully before they are made.

Extension of Railroads Must Be Considered

The commission seems to have been impressed particularly by the point made by George H. Cushing that railroad extension must be considered when a new rate level is in contemplation. The fact that there was a net reduction in railroad mileage last year and that in a normal year the railroads are taxed to their utmost to furnish passable service seems to have deeply impressed the commission. Since Mr. Cushing brought up the question several witnesses have referred to the future adequacy of railroads and have stressed the fact that inefficient transportation is the last thing they want. Members of the commission have asked nearly every witness: "Would you prefer lower rates to assurance of service?" Some have replied that service is relatively more important than the freight rate but most of those testifying have indicated that they will take chances on the service if the rate is reduced.

While the commission, in announcing the hearing, stated that no consideration was to be given differentials, it is evident that they must come in for some consideration. It was pointed out by a witness for the byproduct coke industry that they are more interested in differentials than in a lower rate, as under the present rates byproduct coke is penalized heavily, he said, in favor of beehive coke. Apparently the commission is considering coal and coke as a single commodity, with the probabilities favoring the same treatment for coke as for coal.

That the coal producers were wise in presenting a solid front—by having their case presented by a single witness—has been demonstrated amply as the case of other commodities has been presented. In addition to losing the advantages that go with a single clear-cut presentation, the divergence of views presented by different witnesses has had the effect of weakening the presentation of several commodities.

The further evidence that the commission is going to be doubly sure before taking action tends to the belief that it may be later than April 1 before a decision can be handed down. Practically all those in attendance are agreed that the opinion cannot be rendered before April 1.

It is known that some of the witnesses who will appear for the public will oppose vigorously any horizontal reduction in rates. Arguments will be made for a scientific readjustment, and it is not improbable that a plea will be made for higher rates on certain first-class commodities with the idea of making possible greater reductions in the rates on low-grade freight.

The commission has revised the schedule to some extent. The testimony of the public and shippers as to the general aspects of the case is to be completed Feb. 4. Other assignments are as follows: Vegetable oil and soap, Feb. 8; grain, flour and agricultural products, Feb. 9; railway labor organizations, Feb. 10 and 11; canned goods and wholesale groceries, Feb. 15; fruits and vegetables, Feb. 16 and 17; milk, cream and dairy products, Feb. 18; beverages and beverage containers, waste materials, Feb. 20; live-stock and packing-house products, Feb. 21 and 22; petroleum and petroleum products, Feb. 23 and 24; other commodities, Feb. 25.

Central Pa. Bituminous Coal Output Falls To 9.60 Per Cent of U. S. Total

PRODUCTION of bituminous coal in central Pennsylvania during 1921, according to tabulations by the Central Pennsylvania Coal Producers' Association, dropped to 9.60 per cent of the total produced in the United States, the percentage having been much higher in prevous years. Output by months in thousands of net tons was as follows:

Month	1917	1918	1919	1920	1921	United States 1921	Per Cent from Central Pa. 1921
Jan	5,104	4,637	5,115	4,562	3,865	39,840	09.70
Feb	4,351	4,666	3,148	3,763	3,238	30,794	10.52
Mar	5,261	5,318	3,482	5,196	3,274	29,839	10.97
Apr	4,497	5,084	3,405	4,429	2,775	28,410	09.77
May	4,841	5,215	3,650	4,287	3,185	34,316	09.28
June	5,044	5,393	3,831	4,621	3,283	32,509	10.10
July	4,851	5,590	4,387	4,891	2,947	30,842	09.56
Aug	5,139	5,702	4,832	5,161	3,255	34,241	09.51
Sept	4,717	5,104	4,865	5,347	3,196	35,014	09.13
Oct	5,311	5,266	5,581	5,331	3,893	43,921	08.86
Nov	5,175	4,138	1,205	5,170	3,220	35,895	08.87
Dec	4,367	4,402	3,045	5,414	2,935	31,369	09.36
Total	58,658	60,515	46,546	58,172	39,066	406,990	09.60
Per Cent of U.S. Production	10.63	10.44	10.16	10.39	9.60		

U. S. Will Encourage Legitimate Trade Associations, Daugherty Says

IT is probable that the Department of Justice will not issue a formal statement defining the scope of activities which may be followed by trade associations under the decision of the Supreme Court in the Hardwood lumber case. Attorney General Daugherty says that while the Department of Justice desires to give to business the most accurate information regarding trade associations, the department adheres to the court's decision, which he regards as far-reaching, emphatic and clear. Associations doing a legitimate service for business will be encouraged but the department will not make concessions to organizations which would tend to weaken or abandon the rule laid down by the court in the lumber case.

COAL AGE INDEX

The indexes to Coal Age are furnished free to all who ask for them. The index for the last half of 1921 will soon be ready for distribution. A copy can be had by addressing a postcard to the subscription department of Coal Age.

Bill to Create Coal Commission Introduced In New York Legislature

ASSEMBLYMAN Thomas F. Cosgrove, of Richmond County, Greater New York, introduced in the Legislature at Albany Jan. 26 a measure to regulate the coal and wood industries in the State of New York. While the measure is aimed especially at the distribution of coal and the prices charged therefor, it covers the production, transportation, manufacture, storage, distribution and sale of coal and coal products and wood.

A commission of five members is provided for in the bill, to consist of the Commissioner of Health and four others to be appointed by the Governor, to serve without pay, but to receive their traveling expenses, also their office expenses. Coal is to be regulated as a health measure.

A voluminous system of reporting to the commission is provided. The coal producer reports to the commission the names and addresses of distributors who buy from him, together with the quantities and price; then the distributor has to tell to what dealers he sold it; after that the dealer tells to what individuals he sold it and how much he got for it; the consumer does not have to report.

After that the commission issues an order. If all five commissioners agree on the order, it becomes mandatory and anyone having the temerity to disobey it is liable to $500 fine or imprisonment for one year, or both. If only four out of five commissioners agree on an order, the order is simply filed and it becomes a recommendation.

The measure itself bears all the earmarks of a milk commission bill introduced in the New York Legislature last year. The members of the commission are to be kept honest by not allowing them to hold political office while they serve as such or for one year after surrendering their jobs.

McDougall Shows Why Nova Scotia Scale Should Be Lowered Considerably

THE Board of Conciliation appointed to investigate the wage dispute between the British Empire Steel Corporation and the coal miners in its employ, now sitting at Halifax, N. S., gave a hearing to vice-president D. H. McDougall of the corporation Jan. 20. He declared that business could not be carried on at the recent rate of wages and that the wage proposed was the highest that could be paid if competition and the general demand for lower prices was to be met. He reviewed at length the coal situation in the United States and the general deflation in wages and prices, stating that the coal sales of the corporation had steadily declined month by month, owing to the heavy importation of coal from the United States at prices with which his company could not compete because of the high cost of production in the Nova Scotia mines.

In summarizing the corporation's position Mr. McDougall said that the cost of production since 1914 had increased 224 per cent, that the earnings of the miners had increased by not less than 140 per cent; yet the increase in the cost of living at the coal mines was not more than 50 per cent. The company's prices for coal were 30 per cent less than those of 1921. The ability of the companies to pay wages depended on their ability to sell coal, which without a reduction of wages of approximately 35 per cent could not be mined and sold without loss at the prices now prevailing and likely to prevail in 1922.

Name Committee to Settle Demurrage Bills Of Old Tidewater Coal Exchange

IN order to clear up, if possible, the confusion which has arisen in connection with the demurrage bills rendered by the railroads and computed by the old Tidewater Coal Exchange for the months of January to April, 1919, inclusive, a committee composed of W. A. Marshall, John Crichton and Harry J. Hughes has been appointed. Shippers have been unable to reconcile the bills with their records and correspondence with the various railroads seems to have added to the confusion rather than point to a solution. To effect an adjustment of the matter the committee suggests that it will be necessary to organize a force of accountants, in charge of someone who is thoroughly familiar with this demurrage matter, to meet the expense of which a contribution based upon 5 per cent of the demurrage bills rendered by the railroads is to be sent to the committee. Checks should be made payable to W. A. Marshall, chairman, 25 Beaver St., New York City.

Extent of Shutdown of Bituminous Mines In 1919 Strike Shown by Survey

PERCENTAGES of capacity of bituminous mines closed down on account of the strike of union miners in 1919, taken from the weekly reports of production and running time furnished by operators of about 3,000 mines to the Geological Survey, are shown in the accompanying table. The percentage used represents the average condition for an entire week, but for a selected week—the one in which the strike reached a maximum in the particular district. In many fields the strike was 100 per cent effective from Nov. 1 to the middle of December. In some other districts the men were out for only a week or two. In still others there was a gradual drift back to work extending over several weeks. Furthermore, the week of maximum stoppage did not come in all fields at the same time. For these reasons the shutdown was never quite as complete as shown in the table, though almost as complete during the first week of the strike.

The Survey, of course, has no data as to the number of union miners, but its official records of production during the strike of 1919 shows how each district responded to the strike call. Since 1919, of course, there have been changes in the extent of the union organization. The anthracite region, also, is organized.

STRENGTH OF MINERS' UNION IN 1919 STRIKE

District	Maximum per cent of district capacity closed during 1919 strike	District production in 1918 (Net Tons)	Apparent maximum annual output of union fields (Net Tons)
Central Pennsylvania			
Section A (P. R. R. and connections)	67	[a]25,000,000	16,750,000
Section B (N. Y. C. and connections)	99	[a]16,000,000	15,840,000
Section C (B. R. & P. and other roads)	91	[a]20,629,000	18,772,000
Northern Pennsylvania	100	8,051,000	8,051,000
Pittsburgh, Pa.	100	48,299,000	48,299,000
West Virginia Panhandle	61	3,255,000	1,986,000
Westmoreland, Latrobe, Greensburg and Ligonier	5	17,701,000	885,000
Connellsville	0	35,677,000	0
Somerset	6	7,194,000	432,000
Cumberland-Piedmont	98	7,073,000	6,932,000
Fairmont, W. Va.	[e]90	20,104,000	18,094,000
Northern Ohio	100	30,287,000	30,287,000
Michigan	100	1,465,000	1,465,000
Southern Ohio	100	15,768,000	15,768,000
Northeastern Kentucky	70	7,109,000	4,976,000
Hazard, Ky.	0	2,364,000	1,173,000
Kanawha	88	[b]13,324,000	11,725,000
Kenova-Thacker	0	7,024,000	0
Logan	0	10,307,000	0
New River	98	9,292,000	9,106,000
Winding Gulf	0	5,156,000	0
Pocahontas and Tug River	0	23,128,000	0
Southwestern Virginia	8	9,041,000	723,000
Southern Appalachian	100	[c]11,712,000	11,712,000
Harlan	[d]60	[d]3,202,000	1,925,000
Alabama and Georgia	48	19,252,000	9,241,000
Western Kentucky	58	10,833,000	6,283,000
Indiana	100	30,679,000	30,679,000
Illinois	100	89,291,000	89,291,000
Iowa	100	8,192,000	8,192,000
Missouri	99	5,668,000	5,611,000
Kansas	99	7,562,000	7,486,000
Arkansas	100	2,227,000	2,227,000
Oklahoma	100	4,813,000	4,813,000
Texas	[e]50	2,261,000	1,131,000
North Dakota	[e]30	720,000	216,000
Montana	[e]90	4,533,000	4,079,000
Colorado	55	12,408,000	6,824,000
Utah	0	5,137,000	0
New Mexico	15	4,023,000	603,000
Washington	100	4,082,000	4,082,000
Wyoming	[e]95	9,438,000	8,966,000
Total	71.6	579,281,000	414,625,000

(a) Apportionment of total production for central Pennsylvania between Sections A, B, and C partly estimated. (b) Includes all high-Volatile mines in southern West Virginia not included in the New River, Logan and Kenova-Thacker districts. (c) Includes Tennessee and southeastern Kentucky outside of Harlan County. (d) Of the tonnage of Harlan County Operators' Association 81 per cent was closed, but the Lynch mines continued to operate. (e) Partly estimated.

Southern Ohio and Pittsburgh Coal Producers Post Reduced Wage Scales Effective April 1

RARELY indeed do union operators state in advance their demands for a wage reduction. They usually let the union do the initial proposing. Southern Ohio Coal operators on Saturday, Jan. 28, followed the action taken by the Pittsburgh Coal Producers' Association on Jan. 26 in putting precedent to one side. Both associations have declared that after April 1, when their present contracts come to an end, they will not collect the "check-off" and will pay a reduced scale of wages.

Acting on their own initiative, the southern Ohio producers formulated a scale which provides for reductions from the present scale of from 30 to 47 per cent and elimination of the check-off. It was announced Saturday, Jan. 28. The scale will be submitted to the miners with the request that it be accepted by March 1, to become effective April 1, when the present wage agreement expires. The new pick-mining scale is 77c. per ton, as compared with the present scale of $1.11; machine mining is to be paid at the rate of 60c. a ton, as against 94c. at present; the reduction in day wages is from $7.50 to $4 and in some cases $3.75 per day.

The operators point out that the new scale is considerably higher than that prevailing in 1916 and in formulating it due consideration was given to present economic conditions, wages paid in other industries, the reduction in the cost of living and mining scales now being paid in other districts, especially the non-union districts of West Virginia.

Lee Hall, president of the Ohio organization of United Mine Workers, said nothing could be done with the scale until after the international convention, Feb. 14.

The Pittsburgh Coal Producers Association announced its new scale after a meeting held Thursday, Jan. 26. The scale, which provides for heavy reductions in wages, effective April 1, is as follows:

PITTSBURGH COAL PRODUCERS ASSOCIATION SCALE

Per ton of 2,000 lb., run-of-mine:	
Pick mining, thin-vein	$0.77
Pick mining, thick-vein	0.68
Cutting, thin-vein	0.10
Loading, thin-vein	0.50
Cutting, thick-vein	0.075
Loading, thick-vein	0.465
Yardage and deadwork 30 per cent below 1921 scale.	
Per eight-hour day:	
Motormen	4.60
Motormen helpers, skilled wiremen, tracklayers, bottom cagers, drivers, trip drivers, water and machine haulers, timbermen (where employed)	4.50
Wiremen helpers, tracklayer helpers	4.25
Pipemen for compressed-air plants and all other inside labor except trappers	4.00
Dumpers and ram operators	4.00
Trimmers	3.50
Pushers, car cleaners and all other outside labor	3.25
Trappers	2.00

About sixty companies, some of them extremely large, are included in the Pittsburgh Coal Producers Association. The association says that the new scale provides wages 36 to 40 per cent higher than pre-wartime wages. It provides a higher wage, comparatively speaking, than the reduced wages for some time effective in other industries.

Quoting the declarations of the president of the United Mine Workers at Shamokin, of which the following is one: "The bituminous coal miners expect not only what they have gained but will demand an increase in their basic wage rates," the association declares: "The operators believe that these statements of a determined policy demonstrate the futility of any meeting with the United Mine Workers of America."

Wage Demands Would Add $1.30 Per Ton To Anthracite Price, Operators Assert

COMPLIANCE with the demands of the anthracite mine workers for a 20-per cent increase in contract rates and $1 a day increase for all day men would mean an advance of at least $1.30 a ton in the mine price of domestic sizes of hard coal, according to a statement issued Jan. 24 by the General Committee of Anthracite Operators.

The statement, which also declares that the cost of production would be increased 78.4c. a ton, is the first to be issued by the operators since the United Mine Workers adopted their new wage demands at their tri-district convention at Shamokin, Pa., Jan. 17-21. No comment is made on the decision of the men to strike on April 1, if a satisfactory agreement cannot be reached with the employers by that date, when the present contract expires.

The operators have appointed a wage scale committee, headed by S. D. Warriner, president of the Lehigh Coal & Navigation Co., Philadelphia, Pa., to meet with the wage scale committee of the miners as soon as such a conference is authorized by the union. The demands of the anthracite miners must first be approved at the international convention of the union at Indianapolis, Ind., on Feb. 14, before any conferences with the operators can be held.

No definite rejection of the union's demand is expected until the joint conference is held, and then the negotiations will be taken up by subcommittees, which probably will meet in New York.

"Wage demands of 20 per cent increase in contract rates and $1 a day increase for all day men," said the operators' statement, "made by the tri-district convention of the United Mine Workers of America in Shamokin last week, if granted would mean an increase of at least $1.30 a ton on the mine price of domestic sizes of anthracite—grate, egg, stove and nut—which the consumer would pay.

"Other demands, like that for time and half time for overtime and double time for Sundays and holidays, would also increase labor costs and correspondingly increase prices.

"Using the labor cost of the first six months of 1921 ($3.92 per gross ton) as a basis, the increase in labor cost if the wage demands were granted would be 78.4c. a ton on the total production. Applied to the prepared sizes, or 60 per cent of the production, it works out to $1.30, as given above."

West Virginia Mine Chiefs Are Bailed Out

ON Jan. 18 Keeney and Mooney were released from the Logan County jail on $15,000 bail. Blizzard also was bailed, but on $20,000 bail. Bail was refused to the eight men who are directly accused of taking part in the death of John Gore, a Logan County deputy sheriff, killed in the fighting at Blair Mountain. Bail was furnished by several other defendants during the same day. Judge Bland, on petition of counsel for the United Mine Workers, changed the venue for the trial to Jefferson County.

Frank Snyder, editor of the *West Virginia Federationist*, a radical labor paper, and Isaac Scott, acting secretary-treasurer of the district union, have been arrested on a charge of treason and conspiracy.

THE FEDERATED AMERICAN ENGINEERING SOCIETIES has appointed a new committee on registration of engineers. The personnel of the committee is as follows: A. S. Dwight (chairman), New York; Gardiner S. Williams, Ann Arbor, and Philip N. Moore, St. Louis. A new federal water-power committee also has been named. John H. Finney, of Washington, is the chairman of the committee. Other members are Calvert Townley, New York; G. S. Williams, Ann Arbor; Gano Dunn, New York, and A. P. Davis, Washington.

CONGRESS WOULD ACCOMPLISH more with fewer "blocs" and more tackle.—*Columbia Record.*

Production and the Market

Weekly Review

DEVELOPMENTS last week in the impending wage controversy in the coal industry were of major importance. In the Pittsburgh district operators announced their proposed scale—based on a rate nearly identical with the scale of April 16, 1917—77c. for thin vein coal and 68c. for thick vein. Southern Ohio producers adopted a new scale providing for a cut ranging 31 to 46⅔ per cent. Abolition of the check-off is embodied in both of the above announcements. Union officials in each district have intimated that acceptance of a lower wage scale was impossible.

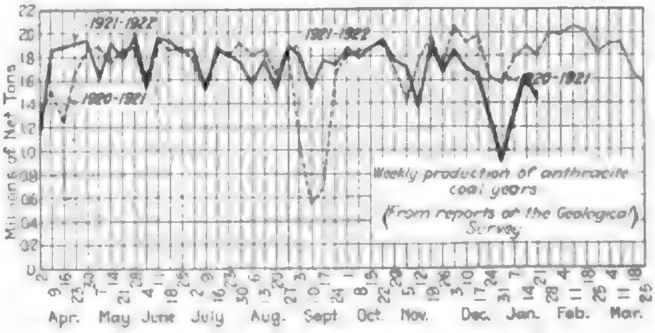
The forerunners of new agreements having been thus summarily disapproved by the miners, a coal strike becomes more of a certainty. The first reflection of a prospective tie-up has been witnessed by the appearance of inquiries for storage coal for delivery prior to April 1. Industrial stocks must be safeguarded in anticipation of trouble, but the uncertain future is a deterring influence to buyers and coal men alike.

NARROW PRICE RANGE FORECASTS HIGHER QUOTATIONS

Consumers desire protection, but not "over-protection," being reminded of the probability of lower mine costs and transportation charges in the next coal year. Sellers hesitate to commit themselves to anything but a current delivery basis at the prevailing prices. So the net result is a better spot market from a production standpoint and a narrowing price range, forecasting slightly higher quotations, which to date, however, have not put in an appearance.

The spot market is stimulated by a better domestic call as winter temperatures continue. This in turn has relieved the scarcity of fine coals and lower steam quotations have offset the improvement in prepared coal prices.

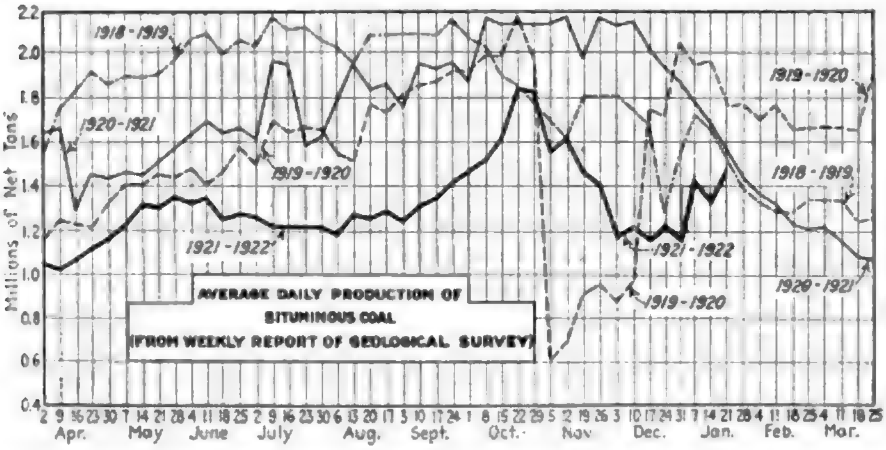
The true gage of the future—industrial activity—is more encouraging. Gains are being made in the iron and steel industry, and railroads, automobile plants, building operations, etc., are inquiring for new material and equipment. Another healthy sign for better business is the gain in movement of revenue freight reported by the railroads. The woolen industry is more active. January saw many conflicting drifts in trade, but favorable factors predominated.



The feature of the anthracite market is the strength of the steam grades. An actual shortage is near, as the curtailed production of late has made the supply inadequate. This is due not so much to increased commercial demand as to the necessarily steady consumption of steam coals by the collieries. With winter weather prevailing, family sizes are, of course, in much better position. While retailers have enjoyed better trade, they have not placed orders in proportion to their outgo and it is evident that many intend to greet April wage readjustments with stock-piles reduced to the minimum.

BITUMINOUS

Production increased 6.4 per cent during the week ended Jan. 21, according to the Geological Survey. The total output was 8,838,000 net tons, as compared with 8,304,000 in the week previous. At present the tonnage mined is slightly



Estimates of Production

(Net Tons)

BITUMINOUS COAL

Week Ended:	1921–1922	1920–1921
Jan. 7 (b)	7,476,000	9,633,000
Jan. 14 (b)	8,304,000	10,763,000
Jan. 21 (a)	8,838,000	9,936,000
Daily average	1,473,000	1,656,000
Coal year	331,171,000	449,879,000
Daily aver. coal year	1,338,000	1,809,000

ANTHRACITE

	1922	1921
Jan. 7	1,242,000	1,597,000
Jan. 14	1,643,000	1,895,000
Jan. 21 (a)	1,443,000	1,819,000

COKE

Jan. 14 (b)	119,000	266,000
Jan. 21 (a)	116,000	258,000
Calendar year	344,000	794,000

(a) Subject to revision. (b) Revised from last report

ahead of consumption, so that some coal is going to storage, although weekly production is still 2,000,000 tons short of the high point reached last October, when the railroad strike threat induced buying. Loadings on the first two days of last week indicated a further increase in production.

New England movement all-rail increased perceptibly during the week ended Jan. 21, 1922, when 2,970 cars were reported through the gateways, as compared with 2,233 the previous week. This tonnage is mainly made up of railroad fuel and orders on old contracts, as the all-rail territory has been greatly reduced by the inroads of water-borne coals. The New England market has reacted slightly to strike talk. Stocks are still heavy and while industrial demands are only increasing slowly, caution is prompting buyers to safeguard their supply in anticipation of trouble. Coastwise freights have advanced with the better inquiries, although recent bad weather has also been a feature.

COAL AGE INDEX BITUMINOUS COAL PRICES, 1922

	Average Spot Price	Index
Jan. 2	$2.325	192
Jan 9	2.290	189
Jan. 16	2.294	190
Jan. 23	2.219	183
Jan. 30	2.207	182

AVERAGE SPOT PRICES OF BITUMINOUS COAL, F.O.B. MINES
(Unit net ton of 2,000 lbs.)

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921
Jan.	$1.46	$1.21	$1.13	$1.53	$4.15	$2.48	$2.57	$2.57	$3.26
Feb.	1.22	1.16	1.12	1.40	4.18	2.53	2.49	2.58	2.77
March	1.17	1.17	1.09	1.27	3.89	2.58	2.47	2.58	2.63
April	1.17	1.16	1.08	1.24	3.21	2.64	2.43	3.85	2.62
May	1.15	1.16	1.07	1.21	4.14	2.67	2.38	4.59	2.68
June	1.14	1.12	1.07	1.26	4.00	2.57	2.40	7.18	2.52
July	1.18	1.12	1.05	1.22	3.17	2.58	2.47	8.24	2.40
August	1.22	1.13	1.07	1.30	3.24	2.58	2.76	9.51	2.42
Sept.	1.23	1.11	1.10	1.57	2.02	2.58	2.91	8.52	2.37
Oct.	1.29	1.13	1.12	2.26	2.02	2.58	3.09	7.78	2.33
Nov.	1.31	1.10	1.17	3.87	2.48	2.58	2.57	5.87	2.35
Dec.	1.26	1.11	1.33	4.01	2.48	2.58	2.58	4.38	2.26
1st Quarter	1.28	1.18	1.11	1.40	4.07	2.53	2.51	2.58	2.89
2nd Quarter	1.15	1.15	1.07	1.24	3.78	2.63	2.40	5.20	2.61
3rd Quarter	1.21	1.12	1.07	1.36	2.81	2.58	2.71	8.76	2.40
4th Quarter	1.29	1.11	1.21	3.38	2.33	2.58	2.74	6.01	2.31
Yearly average	1.23	1.14	1.12	1.85	3.25	2.58	2.59	5.64	2.55

RELATIVE PRICES OF BITUMINOUS COAL, SPOT PRICES JULY, 1913 — JUNE, 1914, AS BASE

1913	1914	1915	1916	1917	1918	1919	1920	1921
120	100	93	126	343	205	213	212	270
101	96	92	116	346	209	206	213	229
97	96	90	105	321	214	204	213	217
97	96	89	103	265	218	200	318	217
95	96	89	100	342	221	197	379	222
95	93	88	104	331	212	198	593	208
97	93	87	101	262	213	204	681	198
100	93	88	107	268	213	228	786	200
102	92	91	130	167	213	241	704	196
106	93	93	187	167	213	256	643	193
108	91	97	320	205	213	212	485	194
104	92	100	332	205	213	213	362	187
106	97	92	116	337	209	208	213	239
96	95	89	102	313	217	198	430	216
100	93	89	113	232	213	224	723	198
106	92	97	280	192	213	227	497	191
102	94	91	152	269	213	214	466	211

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

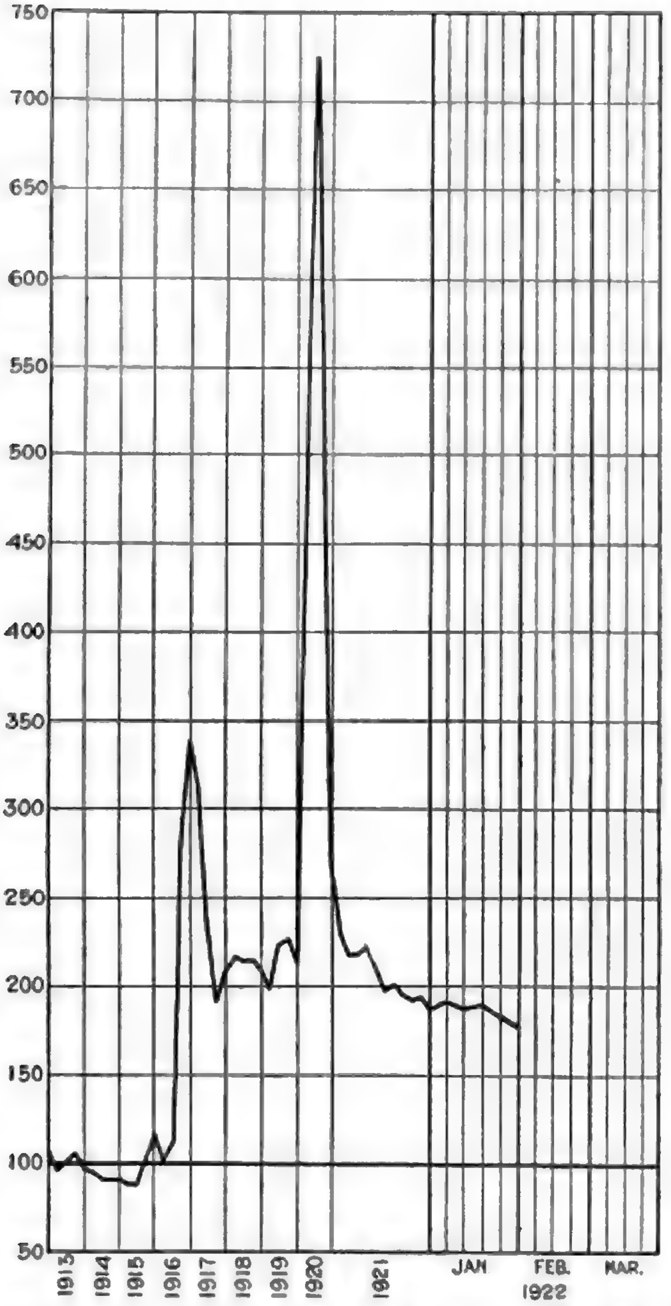
	Market Quoted	Jan. 2, 1922	Jan. 16, 1922	Jan. 23, 1922	Jan. 30, 1922†
Low-Volatile, Eastern					
Pocahontas lump	Columbus	$3.55	$3.45	$3.30	$3.15@$3.50
Pocahontas mine run	Columbus	2.15	2.15	2.15	2.00@2.25
Pocahontas screenings	Columbus	1.65	1.50	1.50	**1.45@1.65**
Pocahontas lump	Chicago	3.10	3.10	2.85	2.50@3.25
Pocahontas mine run	Chicago	2.50	2.50	2.15	1.85@2.50
Pocahontas lump	Cincinnati	3.25	3.00	2.85	**3.00@3.25**
Pocahontas mine run	Cincinnati	2.05	1.90	1.90	**1.85@2.25**
Pocahontas screenings	Cincinnati	1.55	1.30	1.40	1.25@1.50
*Smokeless mine run	Boston	4.70	4.80	4.70	4.65@4.80
Clearfield mine run	Boston	2.05	2.05	1.95	1.65@2.25
Cambria mine run	Boston	2.50	2.45	2.45	**2.25@2.70**
Somerset mine run	Boston	1.80	1.80	1.80	**1.75@2.00**
Pool 1 (Navy Standard)	New York	3.15	3.00	3.20	*2.75@3.00*
Pool 1 (Navy Standard)	Philadelphia	3.00	3.00	3.00	2.75@3.25
Pool 1 (Navy Standard)	Baltimore	2.40	2.30	2.40	**2.65@2.75**
Pool 9 (Super. Low Vol.)	New York	2.35	2.25	2.25	*2.10@2.35*
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	2.30	2.30	**2.25@2.50**
Pool 9 (Super. Low Vol.)	Baltimore	2.20	2.15	2.10	**2.15@2.50**
Pool 10 (H. Gr. Low Vol.)	New York	2.10	1.95	2.10	*1.85@2.25*
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.00	2.00	2.00	1.90@2.10
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.00	1.90	1.95	**1.95@2.15**
Pool 11 (Low Vol.)	New York	1.65	1.70	1.70	*1.55@1.80*
Pool 11 (Low Vol.)	Philadelphia	1.70	1.70	1.70	1.60@1.80
Pool 11 (Low Vol.)	Baltimore	1.75	1.80	1.70	**1.90@2.00**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.50	1.45	1.45	*1.30@1.50*
Pool 54-64 (Gas and St.)	Philadelphia	1.55	1.55	1.50	1.40@1.60
Pool 54-64 (Gas and St.)	Baltimore	1.45	1.40	1.40	**1.50@1.75**
Pittsburgh Sc'd. gas	Pittsburgh	2.65	2.65	2.65	2.60@2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@2.20
Pittsburgh slack (Gas)	Pittsburgh	1.80	1.80	1.75	1.70@1.80
Kanawha lump	Columbus	2.80	2.95	2.60	*2.40@2.65*
Kanawha mine run	Columbus	1.85	1.80	1.65	1.50@1.85
Kanawha screenings	Columbus	1.40	1.50	1.15	1.10@1.25
Kanawha lump	Cincinnati	2.75	2.50	2.50	*2.25@2.65*
Kanawha mine run	Cincinnati	1.45	1.40	1.40	*1.25@1.50*
Kanawha screenings	Cincinnati	1.25	1.00	1.10	*0.90@1.25*
Hocking lump	Columbus	3.00	2.85	2.60	*2.40@2.65*
Hocking mine run	Columbus	1.90	1.85	1.90	1.75@2.00
Hocking screenings	Columbus	$1.40	$1.50	$1.20	**$1.20@$1.35**
Pitts. No. 8 lump	Cleveland	3.05	3.50	3.00	**2.75@3.25**
Pitts. No. 8 mine run	Cleveland	2.00	2.10	1.90	**1.85@2.10**
Pitts. No. 8 screenings	Cleveland	1.95	1.95	1.65	*1.50@1.60*
Midwest					
Franklin, Ill. lump	Chicago	3.80	3.50	3.65	3.25@4.05
Franklin, Ill. mine run	Chicago	2.90	2.80	2.35	2.25@2.50
Franklin, Ill. screenings	Chicago	2.10	2.00	2.05	*1.60@2.25*
Central, Ill. lump	Chicago	3.10	3.10	3.00	2.75@3.25
Central, Ill. mine run	Chicago	2.50	2.50	2.35	2.25@2.50
Central, Ill. screenings	Chicago	1.90	1.80	1.70	*1.40@1.65*
Ind. 4th Vein lump	Chicago	3.35	3.35	3.25	3.00@3.50
Ind. 4th Vein mine run	Chicago	2.55	2.55	2.55	*2.35@2.50*
Ind. 4th Vein screenings	Chicago	2.10	2.10	1.85	*1.50@1.75*
Ind. 5th Vein lump	Chicago	2.95	2.95	2.95	2.60@3.25
Ind. 5th Vein mine run	Chicago	2.25	2.25	2.20	2.00@2.40
Ind. 5th Vein screenings	Chicago	1.80	1.65	1.65	*1.25@1.65*
Standard lump	St. Louis	2.60	2.75	2.75	**2.75@3.00**
Standard mine run	St. Louis	1.85	1.90	1.95	**1.90@2.10**
Standard screenings	St. Louis	1.65	1.35	1.35	*0.90@1.10*
West. Ky. lump	Louisville	2.85	2.75	2.55	**2.50@2.75**
West. Ky. mine run	Louisville	1.90	1.75	1.80	**1.60@2.25**
West Ky. screenings	Louisville	1.65	1.25	1.05	*0.70@1.25*
South and Southwest					
Big Seam lump	Birmingham	3.35	2.75	2.75	**2.75@3.00**
Big Seam mine run	Birmingham	2.10	2.10	2.10	*1.75@2.00*
Big Seam (washed)	Birmingham	2.15	2.15	2.15	*2.00@2.25*
S. E. Ky. lump	Louisville	2.85	2.85	2.70	**2.50@3.00**
S. E. Ky. mine run	Louisville	1.60	1.55	1.55	1.50@1.65
S. E. Ky. screenings	Louisville	1.30	1.25	1.25	*1.00@1.25*
S. E. Ky. lump	Cincinnati	3.00	2.55	2.65	**2.50@3.00**
S. E. Ky. mine run	Cincinnati	1.50	1.35	1.45	1.35@1.50
S. E. Ky. screenings	Cincinnati	1.20	1.10	1.05	*0.75@1.15*
Kansas lump	Kansas City	5.00	5.00	4.75	**5.00**
Kansas mine run	Kansas City	4.10	4.10	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Jan. 16, 1922 Independent	Jan. 16, 1922 Company	Jan. 23, 1922 Independent	Jan. 23, 1922 Company	Jan. 30, 1922† Independent	Jan. 30, 1922† Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$6.75@$7.50	7.75@7.85	$6.75@$7.50	7.75@7.85	**$7.00@$7.50**	7.75@7.85
Egg	New York	2.61	7.00@7.35	7.60@7.75	7.00@7.75	7.60@7.75	**7.25@7.75**	7.60@7.75
Egg	Philadelphia	2.66	7.00@7.75	7.75	7.00@7.75	7.75	**7.15@7.75**	7.75
Egg	Chicago	5.63	7.40*	6.95*	7.40*	6.95*	**7.50***	6.95*
Stove	New York	2.61	7.85@8.10	7.90@8.10	7.75@8.10	7.90@8.10	**7.85@8.10**	7.90@8.10
Stove	Philadelphia	2.66	8.00@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Stove	Chicago	5.63	7.60*	7.20*	7.60*	7.20*	**7.75***	7.20*
Chestnut	New York	2.61	7.85@8.00	7.90@8.10	7.50@8.10	7.90@8.10	**7.85@8.10**	7.90@8.10
Chestnut	Philadelphia	2.66	8.00@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Chestnut	Chicago	5.63	7.60*	7.20*	7.60*	7.20*	**7.75***	7.20*
Pea	New York	2.47	4.25@4.75	6.05@6.45	4.75@5.50	6.05@6.45	4.75@5.50	6.05@6.45
Pea	Philadelphia	2.38	4.50@5.00	6.15@6.25	4.50@5.00	6.15@6.25	**4.75@5.00**	6.15@6.25
Pea	Chicago	5.63	6.10*	5.60*	6.10*	5.60*	6.10*	5.60*
Buckwheat No. 1	New York	2.47	2.25@3.00	3.50	2.75@3.25	3.50	**2.85@3.50**	3.50
Buckwheat No. 1	Philadelphia	2.38	2.25@2.75	3.50	2.75@3.00	3.50	**2.75@3.25**	3.50
Rice	New York	2.47	1.90@2.25	2.50	2.00@2.25	2.50	**2.00@2.50**	2.50
Rice	Philadelphia	2.38	1.75@2.00	2.50	1.75@2.00	2.50	**2.00@2.25**	2.50
Barley	New York	2.47	1.35@1.60	1.50	1.35@1.50	1.50	**1.35@1.75**	1.50
Barley	Philadelphia	2.38	1.00@1.25	1.50	1.00@1.25	1.50	**1.25@1.50**	1.50
Birdseye	New York	2.47	....	2.50	....	2.50	....	2.50

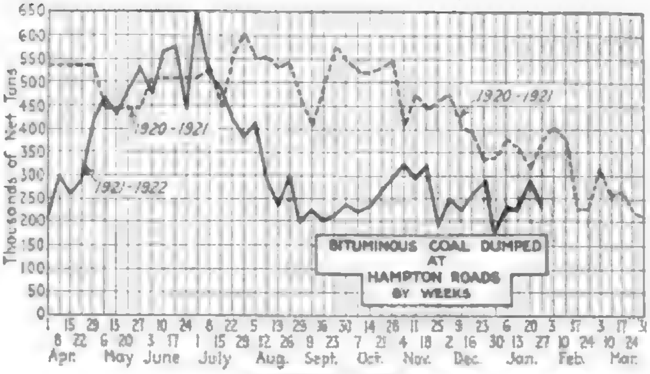
*Net tons, f.o.b. mines. †Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index of relative spot prices of bituminous coal at the mines, 182, week of Jan. 30, 1922. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and, second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram and shown in the table on the preceding page.

Northwestern docks are busily engaged in filling rush domestic orders brought by the colder weather. The steam coals are still sluggish. The Midwest is better able to absorb the heavy shipments of Eastern prepared coals that have been flooding that market this season. This has kept Illinois and Indiana producers from securing much additional business on the better domestic market, although they have been able to dispose of their heavy "no-bills." A week ago yards were clogged with domestic loads for which there were no orders.

The severe weather reduced Hampton Roads dumpings to 235,807 tons during the week ended Jan. 26, 1922, a decline of 30,000 tons from the previous week. The export market is inactive, with the exception of a few cargoes to the West Indies.



ANTHRACITE

Production dropped to 1,443,000 net tons during the week ended Jan. 21, a decline of 200,000 tons from the week preceding. With the better, however, more collieries are resuming and the slump is thought to be only temporary. Orders to the mines have not kept pace with retail distribution, as retailers are endeavoring to reduce their present supplies before April 1. The steam sizes are in greatly improved position and independent prices are at the level of company schedules and in some instances slightly higher.

COKE

Wage developments indicate coming strength in Connellsville coal which will be reflected in the coke market. At present the industry is very quiet; first-quarter contracts apparently are all covered and spot demand is exceedingly light. Production in the Connellsville region shows a slight decline.

Shipping Board Asks $4,637,372 for Coal; Erects Oil Station Near Coal Mine

ESTIMATES submitted to Congress by the Shipping Board request $4,637,372 for coal for the year beginning July 1 next. A. G. Frey, vice-president of the board, in charge of operations, explained the activities of the fuel department of the board in testimony before the House Appropriations Committee. The fuel department covers the purchase of coal, construction and operation of bunkering stations and economies in fuel consumption, in addition to fuel-oil needs of the shipping board steamers.

An arrangement has been perfected whereby the fuel section arranges to approve the quantities of fuel to be on board each vessel when she sails from every port in her itinerary, and when any ship fails to follow the most economical bunker schedule an investigation is held, the responsibility is determined and action taken with respect to the negligent or incompetent engineers. The board also has inaugurated a rigid and thorough supervision of bunkering operations to see that vessels are dispatched promptly, take proper quantities and avoid overbunkering or underbunkering at any port. Vessels in the transatlantic and Gulf service bunker at Norfolk instead of Charleston, saving time and expense.

Testimony was given to the effect that former officials of the board had contracted for the erection for $660,000 of a fuel-oil station at Durban, on the east coast of South Africa, which was protested by the Vacuum Oil Co., the contractor, which called attention to the fact that within a few miles of the proposed oil station was one of the largest coal mines in the world, turning out the finest quality of coal at a much lower price.

While the board had favorable oil contracts it was testified that the board "was stuck on coal," receiving supplies under contracts made last March.

Counsel Schlesinger said the coal and oil contracts of the board had given "endless trouble," explaining that with the falling off of boats in operation the board had no storage space for coal to be delivered under the contracts. Its relations with contractors had become acute and while negotiations for relief of the situation were under way there probably would be litigation over the contracts.

Foreign Market And Export News

British Output Gains Despite Trade Uncertainty; Wage Cuts May Cause Strike at French Mines

British coal production continues to improve steadily in spite of uncertain trade conditions responsible for the 14 days' shutdown of the Sundown Colliery, in Dover. The total output of Great Britain for the week ended Jan. 14 was 4,720,000 gross tons, according to a cable to *Coal Age*. This was an increase of 1,045,000 tons over the previous week. The output a month ago, however, ran close to 5,000,000 tons.

More and more frequent are mine shutdowns in Wales. Operators are constantly finding it more difficult to find buyers at home or on the Continent. The only noticeable demands are from India and the Far East.

Some of the members of the Coal Mining Association are discussing a co-operative scheme for the reconstruction of the British coal fields.

French Miners Suffer Two Wage Cuts

French coal operators in the Pas de Calais and the Nord startled the miners of those regions by deciding last month upon two wage cuts. The first, of 2 fr. 50c., takes effect at once, and the second, of the same size, will become effective in April. The new scale was adopted by the operators while negotiations over wages were going on between masters and men. The union leaders had declared the miners of France would strike if wages were cut.

The operators insist they are not asking the men to make all the sacrifices. They claim that reduction in dividends also will contribute to reduce the cost of producing coal so that the strenuous English competition can be met. More labor saving machinery is to be introduced, they say, in a further effort to hammer down prices.

Each of the two wage cuts, they state will result in a drop of five francs per ton in the price of French coal.

Storms Slow Hampton Roads Activity

Dumpings declined approximately 25,000 tons during the week ended Jan. 26. Weather conditions seriously impeded the physical features of coal dumping. Coal was frozen at all piers, requiring a triple operation to dump cars.

Several cargoes dispatched coastwise to the North were reported held up near their destination on account of ice, and a number of cargoes ready for shipment by barge to New England were delayed here on account of the weather in the Northern ports.

A combine of schooners for the coastwise coal trade is about to be consummated here according to reports in shipping circles. Several schooner masters have arranged to charter five vessels, and, in conjunction with a local coal firm, to engage in developing a New England business. The plans have not yet been completed.

Export Clearances, Week Ended, Jan. 26, 1922

FROM HAMPTON ROADS

	Tons
For Atlantic Islands:	
Am. S. S. Agwistar, for Fort de France	6,579
FOR CUBA	
Br. S. S. Berwindvale, for Havana	7,852
Nor. S. S. Gro for Havana	3,513
Am. S. S. Levisa, for Preston	2,393
Am. S. S. Glyndon, for Sagua de Tanamo	725
FROM PHILADELPHIA	
For Brazil:	
Br. S. S. Coartoun, for Rio de Janeiro	2,714
For Cuba:	
Am. Schr. Josiah B. Chase, for Cienfuegos*	2,500

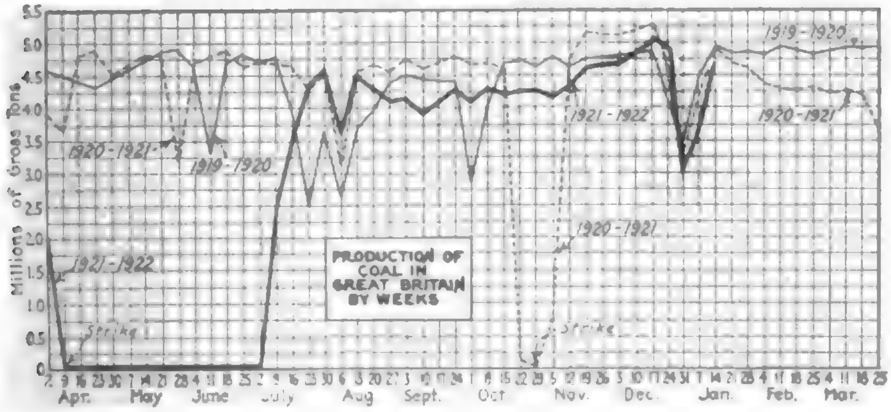
*Including coke.

Coal Paragraphs from Foreign Lands

GERMANY—Production in the Ruhr region during the week ended Jan. 14 was 1,885,000 metric tons, according to a cable to *Coal Age*, as compared with 1,543,000 tons in the week preceding.

ITALY—Cardiff steam first is quoted on the Genoa market at 37s. 3d., according to a cable to *Coal Age*. This is a decline of 3d. from last quotations.

BELGIUM — The coal market shows considerable improvement. Consignments of industrial coal are becoming more numerous and domestic descriptions are still in great demand. The coke market is firmer. During the present year new Limbourg coal fields will be put into operation.



INDIA—The Bombay coal market is steady. Stocks are adequate. The rates are: Bengal first, 35 rupees; English coal, 38 rupees.

Pier and Bunker Prices, Gross Tons

Foreign Bunker Quotations by Cable to Coal Age

	Jan. 21	Jan. 28†
PIERS		
Pool 9 New York	$5.45@$5.65	$5.45@$5.65
Pool 10, New York	5.20@ 5.30	*5.15@ 5.30*
Pool 9, Philadelphia	5.50	5.50
Pool 10, Philadelphia	5.10@ 5.30	5.10@ 5.30
Pool 71, Philadelphia	5.50@ 5.60	5.50@ 5.60
Pool 1, Hamp. Rds	4.65@ 4.80	4.65@ 4.80
Pools 5-6-7 Hamp. Rds	4.25	**4.25@ 4.40**
Pool 2, Hamp. Rds	4.45	**4.50**
BUNKERS		
Pool 9, New York	5.80@ 5.95	5.80@ 5.95
Pool 10, New York	5.50@ 5.60	*5.45@ 5.60*
Pool 9, Philadelphia	5.60@ 5.85	5.60@ 5.85
Pool 10, Philadelphia	5.40@ 5.50	5.40@ 5.50
Pool 1, Hamp. Rds	4.80@ 4.90	4.80@ 4.90
Pool 2, Hamp. Rds	4.60	**4.65**
Welsh, Gibraltar	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Marseilles	120 fr. f.o.b.	120 fr. f.o.b.
Welsh, Genoa	40s. t.i.b.	40s. t.i.b.
Welsh, Madeira	40s. f.a.s.	40s. f.a.s.
Welsh, Teneriffe	40s. f.a.s.	40s. f.a.s.
Welsh, Malta	40s. f.o.b.	40s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Port Said	49s. f.o.b.	49s. f.o.b.
Belgian, Antwerp	30s.	30s.
Alexandria	46s.	46s.
Bombay	38 rupees	38 rupees
Capetown	42s.	42s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Cardiff:	Jan. 21	Jan. 28†
Admiralty, Large	24s. 9d.	24s. 6d.@25s.
Steam, Smalls	18s. 3d.	*17s.6d@18s.6d.*
Newcastle:		
Best Steams	21s.	**22s.**
Best Gas	21s.	**21s.@22s.**
Best Bunkers	20s. 9d.	**21s.**

† Advances over previous week shown in heavy type declines in italics.

Hampton Roads Pier Situation

	Week Ended Jan. 19	Week Ended Jan. 26
N. & W. Piers, Lamberts Point:		
Cars on hand	1,498	1,788
Tons on hand	86,814	99,519
Tons dumped	122,469	119,968
Tonnage waiting	4,450	16,400
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	880	1,276
Tons on hand	49,300	77,000
Tons dumped	73,771	44,568
Tonnage waiting	4,150	22,787
C. & O. Piers, Newport News:		
Cars on hand	824	1,119
Tons on hand	41,200	65,950
Tons dumped	41,830	46,006
Tonnage waiting	7,500	....

United States December Exports of Coal and Coke, by Customs Districts

Customs Districts:	Anthracite (Gross Tons)	Bituminous (Gross Tons)	Coke (Gross Tons)
Maine & N. H.	6	......	......
Vermont	1,163	662	243
Massachusetts	161	......	......
St. Lawrence	108,573	135,613	769
Rochester	6,377	23,762	......
Buffalo	176,046	204,926	6,023
New York	5,225	119	332
Philadelphia	3,131	16,939	1,604
Maryland	......	26,264	3,156
Virginia	......	95,451	......
South Carolina	......	80,173	......
Florida	......	......	58
New Orleans	......	484	506
San Antonio	461	308	2,131
El Paso	2	5,599	932
San Diego	7	16	......
Arizona	1,729	232	......
San Francisco	......	478	9
Washington	67	1,367	......
Dakota	2,133	3,720	1,408
Duluth & Superior	902	5,483	136
Michigan	288	87,738	5,256
Ohio	2	152,758	471
Total	306,277	770,092	23,03

ANTHRACITE

Looks Like Old Times In Hard Coal Market

Cold and Strike Threat Start Actual Rush of Business—Retailers Slow to Restock—Steam Coals Fairly Active These Days

Cold weather and uneasiness over the present mine wage controversy have brought rush times to Eastern and New England anthracite retailers. Retail replenishment of stocks is not keeping pace with domestic distribution of coal, however, and April 1 will probably see many retail yards in low supply. Steam coals are more active.

PHILADELPHIA

The lowest temperature of the winter has enabled the dealers to move a large amount of coal. They expect good business for some weeks to come.

Wholesale prices on stove and nut hold quite close to company quotations of $8.10. Much independent egg has been offered at $7.60. Pea is extremely dull at $4.25 for washery grade although $5 still remains a general price for good coals.

The retail prices have grown weaker. The large majority of dealers insist on $11 for pea but a growing number shade off to $10.50. The standard price for stove and nut is still $14.25, with some dealers offering at $13.75.

Dealers' stocks are gradually running down, and they seem greatly satisfied with this. Their ordering is light. They all have their eyes on April 1 and the feeling seems to grow that it would be the best policy to have light stocks on hand then. They now argue further that if they were heavily stocked and both coal and freight were reduced, they would suffer extremely heavy losses.

The steam trade continues to improve, so much so that some companies have picked up storage coal to fill buckwheat orders. As in other markets, demand for rice and barley has been greatly increased. There is an actual shortage, caused not so much by heavier takings, as by continued reduced production and the fact that colliery consumption of the small coals is always out of proportion to the tonnage mined during curtailed operations.

NEW YORK

Demand suddenly picked up last week and wholesale offices reported better business than for some weeks back. While there was increased activity for domestic coals the greatest call seemed to be for the steam sizes.

Retailers reported consumers nervous. Early in the week many inquiries regarding the outcome of the miners' demands were received and these were followed in many instances by heavy orders. In some cases where the tonnages required were large, buyers were cautioned against uneasiness.

Some independents were able to get slightly higher prices than company circular, but these were exceptional. The companies were able to move their coal freely. There was some cheap washery coal offered here during the week.

Buckwheat was plentiful and moved easily, the better grades of independent coals bringing full company prices. Rice was not so free while the better grades of barley were scarce and in some instances were reported as being quoted 25c. above company circular, although the average was only 10c.@ 15c. above.

ANTHRACITE FIELDS

Some small operations which ran only four or five days during December are now working about four days a week. As against this, however, the Spring Brook Coal Co., at Pond Creek, has closed down indefinitely.

Some of the larger companies are only working three days a week. The Pennsylvania Coal Co. is working the northern half of its colliery the first three days and the southern half the last three days of each week. The Truesdale operation of the Glen Alden Coal Co. has been shut down for a couple of days.

In the middle field one company has announced a cut of 25c. in domestic coal prices and 10c. a ton on pea in order that business might be stimulated. The mines of the Panther Creek Valley are not working full time. Another large company operating over 30 mines in the lower field closed for two days last week.

BUFFALO

Demand is unsteady. Shippers are much puzzled to know why consumers, who formerly bought a winter's supply all at one time early in the season, now put in a load at a time. Shippers say that the actual consumption of anthracite this season will not come up to the average, though they have no reason to give for the falling off.

There is some improvement in the supply of natural gas and that may be accountable for part of the falling off in the use of coal. Lately the gas company has obtained a supply from local byproduct ovens.

All reports from the mines agree that both schedule and independent mines are running at a very slow pace. Some are shut down for want of demand and others find it impossible to sell at a profit, as there is no regular premium paid and in some cases the sales are at prices below schedule at independent mines.

BOSTON

All the companies have had better business the past week, especially on stove and chestnut. Egg and pea are still in poor demand, but the aggregate tonnage in February of all sizes is certain to show up favorably, as compared with January. Better prices being realized by independent shippers is an index of a better trade condition, and now that many retailers have worked off some of their reserves there will be a tendency to replace.

There is a growing certainty that April 1 will probably see a suspension, at least of a few weeks. In any case, buyers are keeping their ears close to the ground, while retail demand has much improved. The extreme cold of the past week has been a factor, but there has also been a proportion of buyers who feel that it is just as well to be forehanded over coal supply.

BALTIMORE

Cold weather for ten days or so past and the big snow storm sent many users of anthracite scurrying for coal. All the dealers were kept busy before the snow came and since the fall have had their hands full with a difficult delivery problem. The majority of yards here have fairly good stocks on hand.

CHICAGO

The demand for anthracite remains sluggish or worse, and one of the larger independents circularized a price list from $1.50 to 75c. a ton off previous quotations. This action speaks as well as anything for the condition of the anthracite market.

South

BIRMINGHAM

Demand is comparatively light, as consumers continue the policy of buying only in quantity sufficient for immediate needs. Resumption along commercial and industrial lines in the direction which would increase coal consumption is slow and unimportant so far in the new year. The Atlanta, Birmingham & Atlantic R.R., which did not provide for an adequate coal supply by contract last year has contracted for about 5,000 tons per month additional for the next twelve months.

Domestic coal is still difficult to dispose of, as dealers have not experienced sufficient relief on their stocks to enter the market for replenishment. Quotations are somewhat unstable: Carbon Hill mine run, $1.75@$2, washed, $2@ $2.25, lump, $3@$3.25; Cahaba mine run, $2.25@$2.50. washed, $2.25@$2.50, lump, $3.75@$4.50; Black Creek mine run, $2.25@$2.50. washed, $2.25@$3, lump, $3.75@$4.50; Corona mine run, $1.90@$2, washed, $2@$2.25, lump, $3; Pratt mine run, $1.75@$2.

Production for the week ended Jan. 14 ran around 230,000 net tons, which was some better than the weeks preceding the holidays. The larger part of this came from mines operated by furnace companies and either went into coke production for their own use or was used as steam fuel at their operations. Commercial and domestic mines are only averaging about two days per week as a whole.

NORTH ATLANTIC

New Schedule of Wages Makes Strike Likelier

Southern Ohio and Pittsburgh Owners Are Positive in Their Tone—Production Grows Slowly—Interest Is Keener Daily

Precautionary buying measures throughout north Atlantic markets occasioned by the strike talk are indicated in the increasing requests for quotations over a period of 60 days. A more healthy demand is also resulting from lowered reserves in consumers' yards. The situation is too unsettled to consider contracting at this time, and the tightening market is one that offers little inducement to operators to tie up their tonnage for the next 60 days.

NEW YORK

There is a better demand and more inquiries are being received. While many consumers believe there is going to be trouble in April with possibly several weeks suspension there are others who laugh at the idea, believing that if the union members quit work the non-union mines will be able to furnish all the coal needed.

Inquiries for the most part have to do with the prospects of shipments in February and as to what might be expected in the way of prices during that month and March. While some consumers have asked about contracts for the new coal year most operators are refraining from quoting because of the uncertainty of labor conditions.

Although demand picked up quotations differ little from last week. On Jan. 27 there were reported at the local docks about 1,400 cars which was a slight increase over the average for several weeks and of which about 30 per cent, it was estimated, was consigned to public utilities.

Southern coals were being offered here on a basis of around $4.60 at the southern ports.

PHILADELPHIA

Bituminous trade here remains at a standstill. Cold weather has had but little effect on the market. Consumers feel that even if there is a strike, non-union mines will stave off a coal famine during its duration. That section of the trade which regularly buys on contract is assured by shippers that non-union coal can be counted on. At the same time, the labor reports emanating from Washington have caused a slight upturn in orders and requests for quotations for the balance of the old coal year.

It is among the mines with union agreements that the greatest feeling exists on the strike question, and these interests have lost so much money already on this account that they want to see the question of wage readjustments definitely settled.

Business at Tide continues light, and even concerns accustomed to ship to Northern ports are handicapped by low-cost competition from Tide shippers in Southern fields.

BALTIMORE

Baltimore, in the grasp of the after effects of the heaviest snowstorm for several years, finds itself with no great reserve of bituminous. Most of the industries here have traveled light as to reserves, and the line supply is certainly poor. At the piers the practical suspension of export movement led at first to an accumulation which was later cleared up by degrees, while practically no new movement reached those points, and the Tide reserve is light. Inquiries a few days ago indicated that the impending strike is on buyer's minds.

The export and coastal delivery movement out of Baltimore since Jan. 1 has been very poor.

Last year Baltimore sent out on coastwise account to New England a total of 520,000 tons; on export a total of 1,646,000; bunker, 509,000; inside capes, 992,000 tons and on other tonnage 17,000, making a grand total of 4,136,000 handled over the piers at this point.

UPPER POTOMAC

Pending adjustment of wages there is no improvement in the district nor is any possible so long as the high cost of production prevents the general run of producers from taking advantage of what few orders might otherwise be obtained.

Not more more than ten per cent of the mines, if that many, are in operation. A few companies are getting out contract coal but even that type of business is rare.

CENTRAL PENNSYLVANIA

Production figures show that continued improvement is taking place. Operators are experiencing better business than for many months. Up to and including Jan. 19, shipments amounted to 34,141 cars, as compared with 32,904 cars in the corresponding period of December.

A number of mines have increased their forces. The possibility of a tie-up at the end of the contract period is a factor in the increased production.

Operators are unable to close contracts for next year's business and will not be able to do so until some wage agreement is reached. Prices are holding firm and Pool 1 is quoted $2.85@$3; Pool 9, $2.20@$2.30; Pool 10, $1.85@$2.10; Pool 11, $1.65@$1.75.

There has been no move for a conference between miners and operators in this field and there will not likely be such a move until after the Indianapolis convention of the U. M. W. on Feb. 14.

FAIRMONT

Inquiries appear to be a little more plentiful but orders are as scare as ever, except for a slightly increased demand for prepared. Prices on lump are practically unchanged. Mine run is hard to move.

Owing to the fact that there is no certainty as to what future labor costs will be, contracting for the new coal year is out of the question. Unconsigned loads, however, are diminishing.

NORTHWEST

Cold Weather Business Rushes Northern Docks

Bituminous Prices Drop and Retail Stocks Move Swiftly—But Large Carry-Overs Are Inevitable—This May Be Lucky For Buyers

Northwestern docks are experiencing a rush of cold weather business. Bituminous prices have been advanced. Retail stocks move quickly but reordering is purely a weather proposition. Even with the better business now prevailing docks are certain to have a large carry-over this spring. The value of this carry-over will, of course, be determined by the length of the impending strike. Should the tie-up be a protracted affair, this tonnage will be a welcome reserve from which to draw supplies; but an early settlement with lower costs inevitable, spells a heavy loss for dock operators.

MINNEAPOLIS

There has been a reasonable amount of rather severe weather lately. Despite this, the coal business has not responded with activity. But things are probably a little better than they seem in that there has been fairly steady consumption, and that means almost no surplus stock in the yards of retailers.

The wholesaler has no very promising outlook. Stocks on the docks have been fairly large, while buying has not been allowed to extend beyond urgent needs. But the repeated cold days must register in increased use of fuel for domestic and other heating plants. There is one difference to be noted from former days, in that consumers now wait until they are about out of coal before they order more, and the order placed is for a small lot.

The local papers have had scare-head stories of the certainty of the coal strike in the spring. But spring seems a long way off to coal buyers, who are not at all alarmed even if a strike is sure for April 1.

Neither are members of the coal trade in the Northwest at all distressed over the prospect for a suspension of mining at that time. They can see no other way in which the stocks of coal on the docks can be marketed at a price based upon their costs—if even that will permit this to be done. For there is a feeling that the net result will be lower coal costs for next season, when the matter is threshed out. And the demand in this section after the middle of March—is not large enough to materially affect stocks for some time thereafter.

There may be a little more interest on the part of railroads. But they are covered by contract as to price, and the coal is available to them, regardless of the probable strike. Some public service consumers may become interested, but they have usually been forehanded and have a contract to protect them in such an event. Even with a strike, there does not seem to be much hope for any great outlet for dock coal for some weeks after the strike starts.

DULUTH

Marked improvement is evident. All docks are working full-time. Conditions are still far from normal but dock men are more than optimistic.

Together with the resumption of trade has come an increase in prices of 50c. all around in bituminous. Lump is quoted at $6.50, with run of pile at $6. Screenings are firm at $4. Pocahontas is $9 for lump, but the market is weak, because of several docks being willing to make concessions.

A revision has also been made in hard coal prices. The grades stand as follows: Egg, $12.50; stove, $12.80; nut, $12.75; pea $10.80, buckwheat, $6. This is the usual seasonal revision, and is remarkable only in that stove commands a premium over nut. Heavy stocks of the latter are on the docks.

MILWAUKEE

Sub-zero weather throughout the territory supplied by Milwaukee has stimulated the coal market to a greater point of activity than has been experienced thus far the present season. The demand runs heavily to anthracite and the domestic grades of soft coal, and the urgency of the orders show that stocks in bins everywhere are far short of what they should be at this time of the year. As was predicted, the cold snap has congested delivery and shipping systems so that it is difficult to serve many as fast as they desire.

Prices are held firmly all around for coal and coke. Yard men are not worrying about the big stocks that remain on the docks, as they anticipate the need of coal next spring to bridge over the period of idleness that will result from the miners' strike which seems inevitable.

CINCINNATI GATEWAY

Coal Streams Through Gateway In Big Volume

Heavier Buying of Smokeless and Steam Sizes in Chicago Market Starts Encouraging Movement — Tonnage Is Mostly on Spot Basis

Heavier buying of industrial coals and an improved call for smokeless in the Chicago market has increased the movement through the Cincinnati Gateway. Domestic fuels are in good demand, with the colder weather. As yet, the impending strike has failed to cause much of an increase in steam demands and that market is weaker because of the heavier offerings of fine coals.

Production reflects the improvement in general markets. The non-union sections are in much the better position, with their lower production costs. The general attitude in the trade is to keep the tonnage on the open market for the balance of the coal year. Operators are not quoting on other than current business.

CINCINNATI

Smokeless factors were booked up on orders last week. Instructions to salesmen were necessary to postpone promises of immediate shipment. This came as a result of colder weather and the discovery of a number of retailers that the hand-to-mouth process of buying was insufficient to their needs.

Railways tapping the two smokeless fields reported that there was a free movement of coal from the scales and assembly yard, which also shows that the supply and demand are running neck and neck. Lake buying, usual at this time of year, has not put in an appearance to any great extent.

The domestic situation still controls the bituminous market and Hoover's warning sent in quite a raft of buying orders. Kentuckians raised their prices on both lump and block and were able to get up to $3 without much trouble. As a result, too, their price on nut and slack was lowered and some of the firms were offering choice coals at 75c. West Virginia offerings were more in line with recent prices with no disposition toward concessions on the residue.

The retail situation remains in status quo after the recent drop in prices. Quite a scattering of small orders followed on the heels of the colder weather. The spread in prices has contracted to the cut made ten days ago.

SOUTHEASTERN KENTUCKY

Mines making domestic coal were able to run a little better last week. The average running time for the field, however, is less than three days per week.

There seems to be a better tone in steam, but prices are weak and most orders booked are for small lots.

Differences of opinion exist as to whether there will be a buying movement started in anticipation of a strike. It is known, however, that some big buyers are taking more coal and press reports from Washington calling attention to the seriousness of the situation will no doubt help this movement along.

LOW-VOLATILE FIELDS

New River and the Gulf

New River field conditions are gradually getting better. More mines are able to make lower prices which conform in a measure at least to those currently prevailing. However, there is hardly enough business to afford all mines an opportunity to work. Increased sales of prepared have stimulated production somewhat. More bunker and New England coal is now moving than during December.

Since the first of the year, Winding Gulf mines have been regaining lost ground, with the output now not far from 50 per cent of potential capacity. Increased production may be attributed in part to a somewhat better demand for bunker coal, with a fairly large tonnage also moving to New England.

Pocahontas and Tug River

Although general dullness reigns in the Pocahontas market, mines are managing to work about 50 per cent of rated capacity. There is a little better market for prepared coal and the Tidewater movement is attaining larger volume. Prices are still unaffected by slight fluctuations in demand.

The output in the Tug River field is no larger than during preceding weeks. There is little spot business available unless it is for prepared and even that demand is very light. It is continuously large shipments to steel companies as well as other contract orders which are sustaining production. Tidewater movement is exceedingly light.

HIGH-VOLATILE FIELDS

Kanawha

Although there is a better tone to the market, mines are not sharing in the improvement owing to the impossibility of producing coal at anything like prevailing prices, owing to higher cost of production than in other fields more fortunately situated from a wage standpoint. A few companies have made independent agreements with their employees.

Northeastern Kentucky

Improvement is generally lacking, either as to demand or prices. Dealers have little business to pass on to the producers as their stocks are still heavy. In consequence lump continues to be priced around $2.75@$3. Operators anticipate a better demand for industrial fuels before long.

LOGAN AND THACKER

Although the spot market is unimproved, Logan production continues at a fairly high rate. Most of it is moving on contracts ranging from 30 to 60 days in length, operators as a rule declining to take longer orders than that in view of the uncertainty as to the future.

Conditions remain virtually unchanged in the Thacker district, where the output is not over 35 per cent. There is a light demand for spot, with prepared being sold somewhat more freely. Contract business is about all this field has, with nearly the entire output going to the railroads or to western markets.

NEW ENGLAND

Strike Doesn't Worry New England Greatly

Buyers Begin Purchasing However—Marine Freights Advance—Prices on Water-Borne Coal Firmer—All-Rail Market Quiet

The New England coal market has reacted slightly to the strike talk. Stocks are still heavy but caution is prompting heavier takings. Bad weather slows coastwise movement. Marine freights have advanced as future quotations are being sought for the first time in many months.

Quotations on water-borne coals have firmed up. There is a tendency on the part of idle producers to hold out for a basis of $2 f.o.b. mines before reopening their operations. The all-rail market is still quiet and little coal is moving, aside from contract orders.

BOSTON

Newspaper discussion of possible labor troubles have caused a renewed interest in buying, especially on the part of larger mills. There have been enough inquiries to give the impression that a considerable tonnage will be purchased between now and March 15, and the trade looks to see a more healthy condition from a sales and operating standpoint. Stocks are large in almost every direction, but fuel cost is a relatively small item in manufacturing now and conservative buyers are inclined to err on the side of prudence. Without much doubt another week will see several mill orders in the market.

The slight reaction on coal has come at a time when bottoms on the coast had been held up more or less by adverse weather and in consequence most of the boats in regular service were chartered for their next trip. There is no shortage of tonnage; it is simply that shippers in their desire to name delivered prices for February have besought vessel owners to name rates and higher quotations are the outcome. Several barge owners have advanced their ideas of freight from 85c. to $1.10 on large boats, 3,500 tons upward, and there are rumors of $1.25 having been paid to a Boston point on a sailing vessel of 2,400 tons.

The same condition is reflected at Hampton Roads. Prices f.o.b. vessel on Navy acceptable grades are still ranging $4.65@$4.80, but more than likely the minimum next week will be nearer $4.75. Several groups of mines are either closed down for the time being, or they are operating but a day or two a week, and should the output be materially increased it would doubtless be on a basis a little over $2 per gross ton at the mine, rather than less. This would mean $4.80 as a minimum figure.

Prices on cars at Boston and Portland are firmer also because of better inquiry. From $6.05 several factors have advanced quotations to $6.25, and even $6.35 for small lots. Large buyers are still able to cover at less than $6, but the cheaper coal is being absorbed and the high marine freights will have their effect on delivered prices.

In the Pennsylvania grades there appears no change of any consequence. Output is light; there is no appreciable demand over the Philadelphia and New York piers, and all-rail inquiry is only scattering and very much restricted. The railroads are taking coal only sparingly on last year's contracts, but they are also indulging in a little buying on the spot market.

KANSAS CITY

There has been a material increase in demand, particularly for domestic grades. For the first time in two months domestic orders were more than ample to provide enough steam grades to supply requirements. Steam plants are being solicited and urged to store coal in anticipation of trouble April 1, but are reluctant to pile up much coal.

Retail dealers in Kansas City are overstocked and orders going to the mines are largely from country dealers who fortunately for themselves are not equipped to store much coal.

There are some changes in prices and quotations are as follows: Kansas lump, $5; mine run, $4; nut, $4.50; slack, $2.50; north Missouri lump, $4.75; mine run, $3.50; washed slack, $3.25; raw slack, $2.50; Arkansas lump, $6; mine run, $4; slack, $2.50@$3; McAlester lump, $8.50; nut, $7; slack, $2.50@$2.75; central Illinois lump, $2.50@$3; egg, $2.25@$2.75; slack, $1.75@$2. Franklin County Illinois coal is unchanged and demand is light.

DENVER

Cold weather stimulated production in the last half of January. The output for the third week was about 200,000 tons against 260,000 for the corresponding week last year. The cold weather also reduced the stocks of coal in local yards, which totaled 75,000 tons the first of the year.

No disturbances were reported when the reduction in wages, known as the C. F. & I. scale was put into effect in the bituminous mines of Routt County. The Colorado Rangers had been sent into the camps to keep order.

The Colorado Industrial Commission announced that it had terminated jurisdiction in the following coal mining cases: Royal mine, owned by the National Fuel Co., at Aguilar; Forbes, Piedmont and La Belle mines, owned by the Rocky Mountain Fuel Co., and the Aguilar mine of the Empire Coal Co. Bituminous lump has dropped $1 a ton at the mines.

SALT LAKE CITY

As a result of the severe weather dealers are enjoying the best business for a long time. Some of them are working overtime. Despite this the operators are far from happy. The Coast Trade has not picked up and production in the state is only about 50 per cent of capacity of the mines. The car and labor situation is satisfactory and there is no talk of a change in prices.

Coke

CONNELLSVILLE

The condition of the coke market certainly is no better, nor has it grown any worse. Steel demand has not improved as much as was expected. Pig iron prices are still easier.

There is no real market in furnace coke, as there is no contracting and the spot market is made by sales of small lots to miscellaneous consumers.

Foundry coke continues in light demand and buyers are more critical as to prices. The market is quotable at $2.75@$3 for spot furnace, $3.10@$3.20 for contract furnace, and $3.75@$4.25 for spot foundry.

The *Courier* reports production in the week ended Jan. 21 at 55,830 tons by the furnace ovens, a decrease of 270 tons and 30,720 tons by the merchant ovens, a decrease of 2,090 tons.

UNIONTOWN

Continued developments in the wage situation with the possibility of a strike growing more pronounced each day have created a stir in the unorganized Connellsville field and operators are evidencing an increasing reluctance to contract coal tonnage for any considerable period

Appreciating that any suspension of production in the union fields will send consumers toward the unorganized districts for tonnage operators are not inclined to view favorably future contracts at this time upon the basis of the present market. Spot tonnage is quoted at firm prices and coal standing on track can be bought on that basis, but where a consumer has an eye on the future, considerable difficulty is encountered in securing quotations.

Already there is somewhat of a flurry around the coal offices but the situation has not yet produced any substantial change in the market. Close observers, however, are proceeding upon the belief that a break is not far distant and are preparing to accommodate coal consumers sent scurrying here in a scramble.

Chicago and Midwest

Colder Weather Brings Rush of Coal Orders

Jam of "No-Bills" in Illinois Melts Quickly and Fuel in Transit Sells at Premium—Non-Union Product Comes in Reassuring Quantity.

Midwestern markets have experienced a rush of orders following colder weather. The heavy accumulation of domestic "no-bills" in the Illinois fields were quickly cleared up and coal in transit has even been going at a premium. Eastern non-union coals are being shipped heavily and this reassures consumers, despite the gathering strike clouds.

MIDWEST REVIEW

Cold weather has had its effect far more on the retailer than on the buyer of steam coal. The retail dealers have been buying only for immediate needs for the past six months, and the householders have been doing the same thing, consequently, when the cold snap came, there was an immediate cry for domestic coal. The railroads answered the call for hurry up shipments, and did remarkable service. We heard of two cars shipped from southeastern Kentucky on Jan. 20, which arrived in Chicago and were delivered on Jan. 24.

The Midwest is still undergoing an invasion from Eastern non-union coals. There are instances where West Virginia or Kentucky coal is offered for sale in central Illinois mining towns at prices almost competitive with the local coals. Every week sees an increase in this tonnage produced by the non-union fields of the East.

The steam market weakened considerably during the last few days, as the demand for prepared sizes necessarily entailed a heavy production of screenings and fine coal sizes. No buying, to speak of, has as yet taken place in anticipation of the strike. More out of curiosity than anything else, the writer called on the purchasing agent of a nationally known corporation, dealing in one of the necessities of life, and asked him bluntly why he was not protecting himself and buying coal for the strike, especially as it was necessary for his plant to operate continually, strike or no strike. His answer to this question was that the non-union mines of the country can give American industry all the coal they want, in fact more than they want, even taking into consideration the remote probability of a marked industrial revival.

The ordinary everyday citizen feels that the coal miners have had things their own way quite long enough and that the time has come when union labor ought to be taught that some consideration is due others besides themselves. In short, a coal strike, if it ever materializes, will be unpopular, and no strike in this day and generation can be carried through to a successful culmination without public sympathy. Union labor overshot the mark during the war, and the inevitable reaction has set in.

From the standpoint of the public, the time is favorable for a show-down, as the demand is so slight, a strike would hardly make itself felt. For the first time on record, it is thought, should a coal strike develop this spring, public sympathy will be with the operators, and that means that the operators will win.

CHICAGO

Cold weather stimulated the trade to a marked degree during the past week, putting the whole Chicago trade—wholesale and retail—in a better frame of mind.

The demand for prepared or domestic coals this week increased. Firms with coal in transit sold at prices 25c@50c. a ton better than they had hoped. Demurrage coal was all cleaned up in short order, and wires sent to the mines for rush shipments.

The steam coal market did not come in for a favorable reaction on account of the weather, although more steam coal was purchased last week than during any week since the first of the year. So much screenings were produced, on account of the demand for domestic coals, that if any change took place at all in the market there was a slight softening in prices.

There is some speculation as to whether operators can deliver the vast reserves of coal stored at the mines and elsewhere by some of the larger southern Illinois producing companies in case of a strike. Many men believe strikers could seriously hamper the delivery—and would.

The demand for smokeless coals, in both mine run and prepared sizes, has been good the last few days. The market on West Virginia splints and eastern Kentucky coals did not improve much, so far as Chicago deliveries were concerned, although there was a big demand for these coals among Chicago wholesalers, who were buying for their Western trade.

SOUTHERN ILLINOIS

Cold weather the last week has helped wonderfully in southern Illinois. Demand has become so good that many mines have cleaned out their surplus holdings. This has helped to steady conditions, which were about on the verge of breaking. The movement is not in any one direction, although the Northwest is claiming a better percentage than any other particular section.

Steam shows the result of the strike talk already, for screenings are in good demand and the price is holding its own at about $1.50. Association operators are asking $4.05 for lump, egg and nut, with nut really going at $3.50. Independents are getting from $3.25 on egg and lump up to $3.50 and as low as $2.75 on nut.

Mine run is quoted around $2.75. Railroad tonnage has shown a material increase.

Somewhat similar conditions prevail in the Duquoin and Jackson County fields. Mt. Olive conditions were very unfavorable, when the cold wave hit and the field has come back unusually well on account of the heavy domestic demand. Railroad tonnage out of this field is good.

Standard shows some improvement in the matter of lump, while screenings are heavy and hard to move. Improved working time is indicated this week at many mines. Railroad tonnage is unusually good.

ST. LOUIS

Last week's cold snap stirred up things at the right time. Householders were low on fuel and many good orders are coming in. Dealers note, however, that the great bulk of the demand is for cheaper coal, either Standard or Mt. Olive, and Carterville comes way behind, with very little anthracite or smokeless, and coke not as heavy as was expected.

Steam plants are gradually putting a little ahead, although not in such a way as to cause any flurry in market prices.

The Northwest is buying considerable domestic coal this week and Chicago has bought heavily from the St. Louis market in both steam and domestic on the cheaper grades.

The buyers are beginning to anticipate the suspension expected in April and are buying slowly and cautiously. Evidently they are not going to wait until the last moment.

LOUISVILLE

Cold weather and the fact that consumers bins are running out, is resulting in considerably better retail demand. Jobbers and producers report better business. As a result of increased movement of prepared, supplies of screenings are larger, but not burdensome as industrial demand is improving.

Some industrial concerns are a little worried over the possibility of a miners strike, and are inquiring for prices, and stocking a little fuel. Operators are anticipating a strike, and are not willing to take any contract business. Reports from some sections of the state are to the effect that more coal trains are being put on. Some of the retailers were threatening to cut prices still lower, but the cold spell is reducing surplus stocks, and no further reductions are in prospect at this time, as present prices leave very little margin. Lump is selling $5.50@$7, according to quality.

WESTERN KENTUCKY

As a result of the present cold wave operators are shipping more coal. With the better demand for prepared, the shortage of screenings is being overcome. While prices of fine screenings are weaker the demand is better, as industries are buying and stocking some coal.

Mines are still operating around two days a week. The general outlook is improving, except for the threatened strike, which is resulting in a lack of interest in long time business.

EASTERN INLAND

Wary Buyers Asking For 60-Day Quotations

Strike Talk Stirs Them to Action—But Market Is Too Unsettled for Contract Selling—Low Reserves Raise Demand Somewhat

New wage scales, proposed by southern Ohio and Pittsburgh operators and their unfavorable reception by miners officials, create further likelihood of a tie-up. Abolition of the check-off is contained in each of the proposed agreements. Production, in the meantime, is slowly moving upward.

Buying interest is keener with the strike talk. Detroit buyers see no cause for anxiety, being well supplied with non-union coals. Retail business has picked up, but domestic prices have increased at the expense of the fine coals.

CLEVELAND

A coal strike on April 1 has been accepted as a certainty in this district and operators and consumers are beginning to adjust their plans in accordance. Inquiries are not heavy as yet, but the ice has been broken and there is every indication that buying will increase. Most operators are declining to quote on deliveries over the next month or two. Prices have not stiffened in the slightest degree yet.

In considering the probable demand in case of a shutdown of mines, operators are scanning the general industrial horizon. Improvement in iron and steel has not been as rapid as some observers had believed likely, but gains are being made and impetus to the improvement is expected to grow as spring approaches. Railroads are in a position where they must buy, and since they use about 20 per cent of iron and steel output, favorable developments are looked for from this source.

Some industries are holding off stocking against a strike in the hope of a lower freight rate. There is no attempt on the part of sellers, however, to scare consumers into placing orders now. The feeling prevails that buyers will need no other pressure than urgent necessities when the time comes.

Slack is selling weaker as the recent coal snap stimulated production of prepared domestic sizes. Retailers are selling more coal. Hand-to-mouth buying is a religion in the trade, and deliveries are expected within twenty-four hours after orders are placed.

Receipts of bituminous coal during the week ended Jan. 21 were 1,333 cars, divided: industrial, 859, retail 474. As compared with receipts during the previous week this indicates a decrease of 228 cars for industries, but an increase of 104 cars to retail yards. Receipts have improved greatly since Jan. 1.

COLUMBUS

Retail stocks have been depleted as a result of better household demand and a considerable buying movement is reported from all sections. Prices have stiffened to a small extent.

Retail prices are fairly steady at former levels and no tendency to advance has been noted. Hocking lump sells around $5.75@$6.25, West Virginia splints, $6.75@$7.25. Pocahontas is $8.50@$9, while anthracite is fairly steady around $14.50. Little coke is being sold at present.

Some factories are resuming. Reserve stocks are still large in many instances and this prevents a more active steam demand. Utilities are now the big feature in the buying side of the trade and a steady demand from that source is reported. There is no tendency to buy for the future at this time.

DETROIT

Near zero temperatures have given a slight impetus to demand for domestic but not for steam coal. Wholesalers and jobbers find it difficult to place even high grade steam stock from districts whose product was formerly sought eagerly.

The larger part of the bituminous supply now coming to Detroit is credited to the mines in the unorganized districts. The steam coal buyers are not stocking against a strike.

Three-inch lump from Ohio is quoted at $3, egg at $2.25; mine run, $1.90; nut and slack, $1.60. Four-inch West Virginia lump is quoted $2.60@$2.75; two-inch lump, $2.25; egg $2, mine run $1.65, nut and slack, $1.25; Pittsburgh No. 8 inch-and-a-quarter lump, $2.35; three-quarter lump, $2.25; mine run, $2; nut and slack, $1.65. Smokeless lump and egg is offered $3@$3.25; mine run, $2.15; nut and slack, $1.25.

EASTERN OHIO

Secretary Hoover's warning signals of an approaching strike has apparently not as yet had any effect on demand for coal. Production during the week ended Jan. 21 was 326,000 tons ar approximately 50 per cent of potential capacity. This is a negligible decrease of a few hundred tons under the production of the preceding week.

Railroad officials say that some improvement is noticeable in the volume of freight traffic. This is a hopeful sign that the requirements for railroad fuel will be increasing in the very near future. At the present low rate of mining operations, it is estimated that the carriers are taking between 40 and 45 per cent of eastern Ohio's output.

Inquiries from industrial concerns are more numerous and a better tone prevails. Continued severe weather throughout this section has stimulated the turn-over of retail coal, resulting in their getting into the market for replenishments.

With the slow but gradual upturn in manufacturing lines, together with the likelihood of labor difficulties at the mines, the opinion seems to be that demand will soon increase.

NORTHERN PANHANDLE

Little coal is being produced except for railroad fuel purposes. Commercial plants are still shut down or else working on a very limited basis. The output continues at the rate of about 50,000 tons a week. Prices continue low.

PITTSBURGH

The event of the week in the Pittsburgh district was the announcement by the operators of the wage scale they are prepared to pay when the present scale expires March 31. The new scale is almost identical with the scale of April 16, 1917. The operators will not continue the check-off.

The head of the local district, U. M. W., has replied that the men cannot afford to accept the rates because the percentage of employment is so small.

The market continues quite full. There appears to be no improvement in the general demand for coal, and nearby non-union districts seem to be making closer prices than ever. The market remains quotable approximately as follows: Steam slack, $1.30@$1.50; gas slack, $1.70@$1.80; steam mine run and ordinary gas, $2.10@$2.20; ¾-in., $2.60@$2.70; Panhandle 1¼-in. domestic, $2.75@$2.90.

BUFFALO

The situation does not change much. Some shippers find a trifling improvement in local demand. Consumers not already stocked are hesitant about buying now to protect against a strike shortage. Some of them think there are enough non-union mines at work to keep up the supply.

So far the demand is so light that prices are at the bottom. Shippers are not selling at uniform prices and some of the jobbers find small margins unavoidable. Everybody looks for changes to come out of the April conferences, but nobody is prepared to predict what they will be. Operators coming from the mining districts bring word that the suspension will last from 30 to 90 days. This wide difference of opinion is enough to show that the uncertainty is great and not likely to be less rignt away.

TORONTO

Cold weather has brought an increased demand for anthracite and dealers are doing an active business. Rumors have been prevalent of a probable drop in price, on account of the lower rate of exchange but dealers say that no change can be expected for some time.

Quotations are as follows:

Retail	
Anthracite egg, stove, nut and grate	$15.50
Pea	14.00
Bituminous steam	10.25@10.75
Domestic lump	12.00
Cannel	16.00
Wholesale, f.o.b. cars at destination	
¾ in. lump	7.00@ 7.75
Slack	6.00@ 6.75

News Items From Field and Trade

COLORADO

Application for authority to reduce wages in its mines has been made by the **Mountain View Coal Co.** at Coal Creek. Four independent coal companies have notified the industrial commission that agreements have been reached with their employees for resumption of work under the new scale.

The Blue Seal Coal Co., in Routt County, has served a 30-day notice on miners that a reduction in wages will be put into effect. There are few mines that have not started to enforce the lower wage scale, and there is a prevailing belief that this reduction will be passed along from the bituminous fields to the lignite mines.

The National Fuel Co., Denver, has contracted for the re-building of the tipple at the Monarch Mine, recently destroyed by fire. The tipple will be complete with a Marcus screen as originally built.

ILLINOIS

The Illinois Central has appointed **W. T. Wright**, of Schellen, as traffic supervisor in southern Illinois. He will have his headquarters at Carbondale.

Ralph Mitchell, superintendent of the Cosgrove Coal Co.'s mines at Marion, is spending a winter vacation at Johnstown, Pa.

C. M. Moderwell of Chicago, who has been connected for some time with the O'Gara interests in Illinois, has severed his connections with that company and will in the future devote his entire time to the company under his own name. This company has recently become enlarged by a merger with the Thos. N. Mordue Co., also of Chicago. The company will continue under the name of C. M. Moderwell & Co., with main offices in Chicago.

Following close on the announcement that Mine 18 of the **By-Products Coal Co.**, at West Frankfort would be closed down indefinitely, the company made a similar announcement concerning Mine 19, also located near West Frankfort. The mine belongs to the Peabody interests.

The Lincoln-Latham Mine, at Lincoln, which is owned and controlled by the **Sangamon County Mining Co.**, of Springfield, and which has again resumed operations after a brief shut-down, has been re-equipped to some extent in underground machinery, including 200 new pit cars.

The working force of the **Springfield District Coal Co.'s** Woodside Mine has been cut from 300 to 100 men by agreement between the company and employes. Conditions were such that steady work for 100 men or irregular work for 300 men was offered, and the miners voted to accept the reduction in working force.

The state has given authority to the **Pratt Coal Co.** to erect a temporary wood tipple at the Jeffrey Mine, Herrin, to replace the one destroyed recently by fire. Record time was made in the replacement and the mine is now in operation. A new steel tipple will be erected soon.

Mine No. 9 of the **Consolidated Coal Co.**, of St. Louis, was recently subjected to a second flood when several million gallons of water broke through when the temporary "fill" in the original cave-in sagged under the weight of tons of earth as the support of flood water receded through the pumping. The second flood was the surface water from an extensive watershed held back from the river by the dams built to keep the river water back from the surface near the cave-in.

INDIANA

The William Nackenhorst Coal Co., of Indianapolis has filed a final certificate of dissolution with the secretary of state.

W. E. Watson Jr., of the Fairmont & Cleveland Coal Co and **Glen F. Barnes** of the Hite-Barnes Coal Co. spent the latter part of January at French Lick Springs.

The Lafayette Ice & Coal Co. has been incorporated with capital of $150,000 by H. B. Hanger, L. B. Weisenburgh and W. A. Hanger.

The Binkley Coal Co., an Illinois corporation, has qualified to do business in the state of Indiana. Papers were filed recently showing capital in this state of $150,000. The company will engage in the operation of coal and other properties. M. H. Stark, of Terre Haute, is the Indiana agent.

The Indiana Fourth Vein Mining Co. at Terre Haute, has filed papers showing a capitalization of $100,000, for the purpose of operating coal mines. George G. Rowland, Thomas D. Haskett and Walter S. McCloud are directors of the company.

Officials of the **Little Giant Coal Mine**, in the Linton field, are making plans to install four large motors and much mine machinery as a result of a fire recently which destroyed the engine rooms.

The Clinton Coal Co., of Clinton, has not answered the proposal submitted recently by District No. 11, U. M. W., in an effort to bring about a settlement of the strike of the company's 700 miners. The company told miners that they were willing to meet the men "half way" but would not comply with the request that Richard Bledsoe, over whom the strike was called, be reinstated as well as paid for all time lost since the strike order last October.

KENTUCKY

Himler Coal Co. plans to expend $175,000 in mine development and establishment of a mining town.

The Bell-Dean Coal Co. has been chartered by J. M. O'Brien, Conrad Kolb and Guy Vinson. The same interests are connected with the Vinson-Kolb Coal Co.

J. H. Martin, of the Kanawha-Knox Coal Co., Cincinnati, has been visiting operations in Bell County.

The Grapevine Coal Co., Madisonville, has been chartered with a capital of $300,000 by D. A. Elgin, Benjamin N. Gordon and Robert E. Cooper.

Ray B. Moss, of the Federal Coal Co. has returned from a conference at the office in Chattanooga.

The C. L. Ryley Coal Co., Lexington, has filed amended articles increasing its capital stock from $200,000 to $300,000.

The Cherokee Coal Co., capital $25,000, has been chartered by John F. Hershet, Louis R. Glogower and T. V. Borntraeger.

The Jeffrey Mfg. Co. has filed suit against the bankrupt **Four-in-One Coal Co.** for judgment of $13,309.87 on a note executed by President John A. Seisman of the company last fall to pay for mining machinery shipped to the company mine in Perry County. The Jeffrey company asks a prior lien on the machinery.

Thirty-three miners walked out at the **Caner Creek Coal Co.**, Henderson, recently, when the company refused to reinstate two men discharged a week before. The company had never signed a union contract but had paid the scale. It has announced that hereafter it will operate as a non-union mine.

NEW YORK

Thomas F. Macksey has resigned his position with Dickson & Eddy. Mr. Macksey is well known to the coal trade and was for thirty-two years connected with Dickson & Eddy.

Wentz Company and **Stonega Coke & Coal Co.** announce the removal of their offices from 90 West Street to 25 Broadway, New York.

In accordance with editorial plans for 1922, announced in *Chemical & Metallurgical Engineering*, Jan. 4, the managing editor of that magazine, **J. S. Negru**, will sail for Europe on Feb. 11. He will make a trip through Germany, France, Belgium and other European industrial countries. The purpose of the trip is to study industrial and economic conditions and observe the latest advances in science, engineering and technology. Mr. Negru is unusually well qualified to undertake this work, which should prove distinctly serviceable to the readers and advertisers of *Chemical & Metallurgical Engineering*.

OHIO

A. A. Augustus, president of the Cambridge Collieries Co., Cleveland, has departed for Florida for a brief sojourn.

C. S. Deal, formerly secretary and treasurer of the Sauters Coal Co., Cleveland, large operators in the eastern Ohio field, severed his connection with that firm recently for the purpose of taking a well-earned but long deferred vacation, after thirty years of active participation in the coal trade. Mr. Deal will leave for Los Angeles, and will locate permanently in southern California. **J. D. Sauters** succeeds him.

A. V. Roberts, formerly Detroit representative of the Sauters Coal Co., Cleveland, but more recently with the Fred H. Roberts Co., candy manufacturers, has re-entered the coal business. He is now affiliated with the sales department of the A. F. Baier Coal Co., Cleveland.

Lippincott, Mills & Co., Inc., chartered in New York to deal in coal coke, ores, etc., has recently opened an office in Cleveland, in the Hippodrome Bldg., C. W. Lippincott, who had been the head of Lippincott & Co., coal dealers, is president of the new company.

Charles E. Maurer, of the Glens Run Coal Co., Cleveland, prominent in coal trade circles, has departed for a few weeks' sojourn in Florida.

The common pleas court has named Barton Griffith, Sr., a Columbus attorney, receiver for the Allied Power Industries, a trust estate of Columbus, upon proceedings stated by trustees of the estate in the performance of duties imposed upon them by the creation of the trust. At the same time, Ralph E. Westfall was named receiver for the **Gnaden-Goshen Coal Co.**, a corporation, whose stock is controlled largely by the Allied Power Industries. **The Atomized Fuel Industries Co.**, another corporation, controlled by the trust estate is not affected. The receivership is explained by the dilatoriness in the payment of sums due the trust estate and the trustees are thus unable to meet when due claims of creditors. It is believed that the legal tangle will be straightened out in a few weeks.

State Auditor Tracy, acting as a master commissioner in the case of Thrailkill & Walton against the former Ohio purchasing department, has rendered a decision on pay to be given companies supplying coal to various state institutions under contracts which were declared illegal. **The H. W. Jenkins Coal Co.**, Columbus, has its bill cut $3,720; the **McVicker Coal & Coke Co.**, Cleveland, had its bill cut $1,877, and the **H. S. Odbert Coal Co.**, Cleveland, has its bill cut $2,667. **The Sunday Creek Coal Co.** is to be paid $1.85 per ton instead of $1.95, which was the contract price for 13,000 tons. Small cuts were also handed the **Colonial Coal & Supply Co.**, **The McIntyre Coal Co.**, **The Reliable Coal Co.**, and the **Roberts Coal Co.**, all of Columbus. Payment of the full contract price was recommended in the case of **Castner, Curran & Bullitt**, Cincinnati; **Kinwood Coal Co.**, Columbus, and **F. F. Taggart**, Massillon.

PENNSYLVANIA

Auditor General Lewis is sending out blanks to all anthracite operators for reporting the value of tonnage prepared for market in the period July 1-Dec. 31, 1921, under the provisions of the Williams Act. The auditor general has endeavored to make his list of operators complete, but failure to receive the blanks does not relieve from responsibility for reporting. Operators of washeries and persons or firms recovering anthracite from streams are held by the state authorities to fall within the provisions of the law, and they will be required to fill out returns. Returns are to be made by Feb. 1, but upon application to the auditor general, an extension until Feb. 15, can be obtained.

An involuntary petition in bankruptcy was filed recently against the **Gardner Quemahoning Coal Mining Co.** a corporation engaged in mining and selling coal at Johnstown. Creditors' claims amounted to $598.93.

J. H. Strawn, of Gloversville, N. Y., has been elected secretary and treasurer of the Washington Coal & Coke Co. to succeed the late **J. H. Price**. The stockholders at the annual meeting elected the following directors: Mrs. Sarah B. Cochran, M. M. Cochran, A. C. Sherrard, John M. Core, W. J. Sherrard, A. J. Wurtz, Henry T. Cochran, M. E. Strawn and Charles A. Painter. Officers named were M. M. Cochran, president; M. E. Strawn, vice-president and J. H. Strawn, secretary and treasurer.

Through an application made by **Michael E. Stroup**, a Harrisburg lawyer, for a lease, the members of the Pennsylvania Forest Commission have learned that the state owns anthracite deposits. The coal has been found in an outcrop in the Haldeman state forest, in the Lykens Valley, and Mr. Stroup asks for a 15-year lease, with an option of a 10-year extension.

A mortgage for $60,000,000—the greatest ever executed in Lackawanna County—has been filed. The mortgage is entered into by the **Glen Alden Coal Co.** and the **D. L. & W. Ry.** for the transfer of coal lands in Lackawanna and Luzerne counties from the latter to the former. The mortgage was executed Sept. 21, 1921, and will be reduced by several bond issues. At the time of the segregation of the coal from the railroad interests of the D. L. & W. the Glen Alden company was formed and all of the property of the railroad company, which was connected with the coal department was purchased.

The Somerset & Cambria Coal Mining Co. has closed a deal for the purchase of 110 acres of coal land in Somerset County. The property is located one mile north of Somerset. The company also has obtained an option on an adjoining tract of 500 acres. The company was organized recently, with a capitalization of $100,000. R. H. Speicher is the president of the organization.

Dauphin County assessment figures for taxation purposes have been increased nearly $3,000,000, but the assessors made no changes this year, the time for the triennial assessment, in the valuations placed upon the coal properties of the **Philadelphia & Reading Coal & Iron Co.** and the **Susquehanna Collieries Co.** The holdings of these companies were materially increased three years ago and the increased taxes have not been paid in full, pending court action.

During the first six years of workmen's compensation in Pennsylvania agreements or awards were made in 386,288 cases out of a total of 1,136,060 accidents reported to the **Bureau of Workmen's Compensation** of the State Department of Labor and Industry. The sum of $59,039,651 has been awarded and of this total $32,183,790 has been paid, leaving an outstanding liability at the first of this year of $26,689,022. At the beginning of 1921 there were obligations of $23,544,098 outstanding. During the six-year period there were reported to the bureau 16,166 fatal accidents, 418,193 serious accidents, 709,701 minor accidents.

The customary handsomely engraved calendar of **Weston, Dodson & Co., Inc.**, has been issued to the trade, and accompanying it is a letter of greeting, informing coal consumers of the outlook for the year.

The Weaver-Coleman mining interests, located in Cambria County, and also the interests of the same partnership located in West Virginia, are being divided between the members, B. Dawson Coleman and J. H. Weaver. A report of the dissolution of the partnership was printed in *Coal Age*, Jan. 26, 1922, p. 181. The amount involved in the deal will reach $25,000,000 and includes the Nant-y-Glo Coal Mining Co., the Ebensburg Coal Mining Co., the Monroe Coal Mining Co., and the newly organized Melba Coal Mining Co. These mines were designed for a maximum output of 15,000 tons per day. It is understood that one partner would take the Colver and Melba interests and the other the Nant-y-Glo and Revloc properties. No announcement was made of the division of the holdings in West Virginia.

TENNESSEE

The Eastman Kodak Co. is to erect a $25,000 coal and cinder-handling plant at Kingsport.

The new $750,000 **Dixie Coal & Lime Co.** has purchased 4,000 acres for development.

The Mobile & Ohio R.R. Co. is to erect a $25,000 coal and cinder-handling layout.

UTAH

The Premier Coal Co. of Ogden has filed articles in Idaho. It has a capital stock of $200,000 in 2,000 shares.

The State Securities Commission has granted the **National Coal Co.**, of Salt Lake City, permission to sell $50,000 worth of 6 per cent bonds. This company holds 1,323 acres of coal land on Gordon Creek, Carbon County, and about 80 acres of adjoining lands for a settlement and railroad terminal.

The Royal Coal Co. of Salt Lake City has entered the retail field by opening up a large yard in the city. S. F. Bailif, Jr., is president of the company.

According to a decision just arrived at by the **State Board of Equalization**, coal land assessments for 1922 will be determined on a basis of the location of the beds in relation to transportation. Coal beds that are more than twenty miles from a railroad have been assessed at three mills per ton in the past. During the present year this value will attach to lands between 20 and 30 miles of a railroad. For coal land between 30 and 40 miles the assessment will be 1½ mills per ton and for over 40 miles only ⅒ of a mill will be charged.

According to figures received from the United States Bureau of Mines, the number of men killed in coal mines in this state during 1921 was 15 compared with 37 the year before.

VIRGINIA

Lee Long, superintendent of the Clinchfield Coal Corporation and himself a large mine owner in southwest Virginia, was a recent visitor in Norfolk.

W. E. Hudgins, Jr., formerly head of the Hudgins Fuel Co., is now with Nottingham & Wrenn, coal dealers of Norfolk.

S. T. Snead, commissioner of the Sewall's Point Coal Exchange, has returned from New York, where he attended a meeting of the exchange. **W. S. Saunders**, of Norfolk, general freight agent of the Virginian, also attended this meeting.

Thomas S. Southgate, head of the Southgate Export Coal Co., has been elected chairman of the Woodrow Wilson Foundation committee for Norfolk.

WASHINGTON, D. C.

Four mines are now producing coal from leased government lands under the Leasing Act of Feb. 25, 1920, according to the semi-annual report just submitted to Director H. Foster Bain of the Bureau of Mines by H. I. Smith, acting mining supervisor. Two of these mines are located in Wyoming and one each in Utah and Colorado. According to this report, thirty-one prospecting permits for coal have been granted in Wyoming, nineteen in Montana, eighteen in Colorado, ten in Oregon and smaller numbers in California, Idaho, Nevada, New Mexico, North and South Dakota, Utah and Washington. A total of 104 coal prospecting permits have been granted, in addition to which there have been granted nine leases and five licenses to individuals and associations of individuals.

Representative London, of New York, has introduced a resolution in the House for an investigation by the **House Committee on Mines and Mining**, or a subcommittee, of conditions prevailing in the coal mining industry with particular reference to the condition of the workers and the state of unemployment therein, and to recommend legislation.

The Supreme Court has heard arguments in the case of the **Morrisdale Coal Co. vs.** the United States, on appeal from the Court of Claims, in which the company seeks to recover prices above those fixed by the Fuel Administration during the war.

During consideration of **appropriations for the Shipping Board** in a House debate, Representative Wood, of Indiana, criticised the board for establishing fuel oil stations at fabulous cost and transporting oil thereto, on the far coast of Africa, where he said "coal mines exist everywhere and where free coal is protruding from the ground." He charged that the board was unacquainted with the situation to so establish oil stations and that it had even disregarded advice that oil could not be used in that territory and that coal would be used. "And yet they built oil tanks to supply coal-burning steamers," he said.

Argument was heard recently in the Supreme Court in the suit of the **Pine Hill Coal Co.** for recovery from the government of prices for coal in excess of those fixed by the Fuel Administration. Attorneys for the coal company argued that the prices did not cover cost of production and a fair profit, which they insisted were guaranteed by the Lever Law. Assistant Attorney General Riter for the government argued that the law did not impose a liability on the government to guarantee prices above those fixed by the Fuel Administration.

The Interior Department in a report to Congress states that on Nov. 30 last there were 39,640,172 acres of coal lands in the public domain withdrawn from entry.

R. K. Boggs, of Newport, Ky., Chairman of the Fuel Committee of the National Association of Purchasing Agents, and **H. B. Heydon**, secretary of the association, represented that organization before the Interstate Commerce Commission at the general rate inquiry held in Washington.

WEST VIRGINIA

Paw Paw District of Marion County is to be the seat of operations of the **Fairmane Coal Co.**, the office of which will be at Fairmont. This company is capitalized at $30,000. It was organized by D. A. Maurer, May U. Maurer, P. A. Sacci, T. M. Sacci, T. M. Scott and Martha M. Scott, all of Fairmont.

The American Coal Co. of McComas has contracted for the complete installation of a Marcus tipple at the Crane Creek operation.

A. Lisle White, of Clarksburg, head of the Northern West Virginia Operators' Association, was recently in Washington in attendance at a meeting of the West Virginia Coal Association.

C. H. Jenkins, of Fairmont, treasurer of the Hutchinson Coal Co. and also a director of the National Coal Association was attending a meeting of the West Virginia Coal Association at Washington recently.

Organization of the **Turner Coal Co.** with a capitalization of $150,000 presages further development of the Williamson coal field, this company to operate in the vicinity of Burch. Active in effecting a preliminary organization were: W. R. Turner, of Hamilton, Ohio, J. W. Fuller, E. P. Rice, W. T. Smythe and H. T. Redd of Fairmont.

J. G. Bradley, of Dundon, president of the National Coal Association, attended a meeting of the West Virginia Coal Association at Washington recently, going from Washington to White Sulphur Springs where he attended a meeting of the Winding Gulf Operators' Association.

A reduction in wages and salaries has been made in the Jones interests mines of Logan County, *Coal Age* is informed in a letter from John H. Morris of Lundale. The mines affected are those of the **Lundale Coal Co. the Three-Forks Coal Co. and Toney Coal Co.**, all near Lundale.

W. Gaston Caperton of Slab Fork was at White Sulphur Springs recently attending the annual meeting of the Winding Gulf Operators' Association, of which he is vice president.

C. H. Mead of the Winding Gulf field, with headquarters at Slab Fork, was in attendance at the annual meeting of the Winding Gulf Operators' Association.

A gift which geologists estimated may produce a revenue exceeding $3,000,000 was made to the West Virginia University and the City of Morgantown by **Dr. I. C. White**, State Geologist. It consists of 1,900 acres of coal land in Marion County. The revenue is to be divided equally between the university and the city.

BRITISH COLUMBIA

OUTPUT FOR DECEMBER, 1921

	Tons
Vancouver Island District	
Canadian Western Fuel Co., Nanaimo	49,913
Canadian Collieries (D) Ltd.	
Comox	31,500
South Wellington	7,757
Extension	20,326
Nanoose Wellington Collieries	7,400
Granby Consolidated M. S. & P. Co.	24,808
Old Wellington (King & Foster)	485
Total	142,189
Nicola-Princeton District	
Middlesboro Collieries	7,186
Fleming Coal Co., Merritt	3,171
Coalmont Collieries, Coalmont	8,488
Princeton Collieries, Princeton	2,415
Total	21,260
Crow's Nest Pass District	
Crow's Nest Pass Coal Co.	
Michel	19,882
Coal Creek	26,939
Corbin Coal & Coke Co.	4,398
Total	51,219
Total for December	214,668
Total for November	234,800

Traffic News

The commission has authorized the establishment of rates on coal from Springfield, Ill., and points in the Springfield group and related groups, to Hannibal, Mo., via Bowling Green, Mo., the same as rates by the direct line and to continue higher rates at intermediate points.

Upon further consideration the commission has decided that the differentials established in the Illinois coal cases are reasonable. These differentials are from the Third Vein, Springfield and Belleville districts and are 70c., 30c. and 10c. below rates from the southern Illinois group and 40c. and 70c. less than rates from the Fulton-Peoria district.

The commission has authorized the Alaska Anthracite R.R. to construct an extension of its line in Alaska.

The application of the C. M. & St. P. Ry. to build a belt-line between Aurora and Joliet, Ills., is regarded in the Twin Cities as promising a more direct line for hauling coal from the Indiana fields to the Northwest, avoiding the Chicago terminals.

An examiner of the I. C. C. has recommended that the combination rate on a car of soft coal from Alger, Wyo., to Montevideo, Minn., during Federal control was not unreasonable, as complained by **F. L. Starbeck.**

In the matter of intrastate rates on bituminous coal in Ohio, the **Toledo Chamber of Commerce** has filed a brief with the I. C. C. contending that the rates on coal between points in Ohio are unreasonably high in themselves and in comparison with rates from other mines to Toledo and from Ohio mines to destinations in C. F. A. territory.

In the complaint of **Michael S. Goss** and others and **Albert H. Traphagen** and others, an I. C. C. examiner recommends that the rates on coal from the anthracite region in Pennsylvania to Auburn, Groton, Moravia, Waterloo and Seneca Falls, N. Y., via the Lehigh Valley R. R., is unreasonable.

In the complaint of the **Hewitt-Wilcox Coal Co.**, an examiner recommends that the joint rates of the D., L. & W. and the N. Y. C. on anthracite from Pennsylvania mines to Auburn, N. Y., are not unreasonable.

The Chicago & Eastern Illinois system's coal road, known as the **Brazil Branch**, has been sold, the bondholders buying the line, on which they hold $5,550,000 in obligations, for $15,000. Edwin P. Kelly, attorney, of Chicago, made the purchase for the bondholders. Operation of the road was abandoned by the C. & E. I. the first of the year.

Governor Davis has ordered the Ohio Public Utilities Commission to start at once a thorough investigation of freight rates on coal shipments within the state with a view of reducing them. The governor transmitted to the commission a mass of data, showing that increased freights during the period of government control of railroads amounted to from 104 to 250 per cent. This is one of the big discouragements to the coal industry in the state and the governor desires it to be remedied as soon as possible.

The National Retail Coal Merchants Association, of Philadelphia in a complaint to the I. C. C. alleges unjust, unreasonable, discriminatory, preferential and otherwise unlawful and illegal rates, charges, rules, regulations and practices relating to weighing and re-weighing of hard and soft coal and coke.

Recent Patents

Coal-Mine Curtain Rod. John M. North, Sparta, Ill., 1,398,909. Nov. 29, 1921. Filed Oct. 10, 1918; serial No. 257,626.

Lamp Holder for Miners' Caps. Joseph Barta, Martins Ferry, Ohio, 1,397,200. Nov. 15, 1921. Filed Jan. 18, 1921; serial No. 438,216.

Apparatus for Purifying Water. Andrew J. Reed, Wilkes-Barre, Penn., 1,397,452. Nov. 15, 1921. Filed June 28, 1921; serial No. 481,024.

Mining Self-Loading and Unloading Scraper. Charles H. Strange, Minersville, Penn., 1,397,560. Nov. 22, 1921. Filed June 29, 1920; serial No. 392,862.

Mining Machine. Nils D. Levin, Columbus, Ohio, assignor to The Jeffrey Mfg. Co., Columbus, Ohio, 1,395,647. Nov. 1, 1921. Filed Sept. 28, 1916; serial No. 122,705. Renewed Jan. 28, 1921; serial No. 440,806.

Mineral or Coal-Separating Jig. Harry D. Kostenbauder, Aristes, Penn., 1,395,716. Nov. 1, 1922. Filed Oct. 2, 1920; serial No. 414,168.

Conductor for Mine Explosives. Robert L. Bowman, Knoxville, Tenn., 1,395,791. Nov. 1, 1921. Filed Jan. 19, 1921; serial No. 438,416.

Conductor for Mine Explosives. Robert L. Bowman, Knoxville, Tenn., 1,395,792. Nov. 1, 1921. Filed Jan. 19, 1921; serial No. 438,417.

Ventilating Signal Appliance for Mines. James F. Gamille, Fredericktown, Penn., 1,395,594. Nov. 1, 1921. Filed July 19, 1919; serial No. 312,009.

Mining Machine. Morris B. Holmes, Claremont, N. H., assignor to the Sullivan Machinery Co., Chicago, Ill., 1,396,996. Nov. 1, 1921. Filed May 23, 1918; serial No. 236,225. Renewed March 30, 1921; serial No. 457,028.

Rock Crusher. James F. Betchkaw, Berlin, Wis., assignor to The Frog Switch & Mfg. Co., Carlisle, Pa., 1,396,016. Nov. 8, 1921. Filed May 22, serial No. 298,880.

Apparatus for Utilizing Lump Fuel. Joseph H. Cooper, Chicago, Ill., 1,396,097. Nov. 8, 1922. Filed July 20, 1918; serial No. 245,808.

Power Shovel or Excavating Machine. Charles Lotte, Marion, Ohio, 1,396,375. Nov. 8, 1921. Filed Jan. 30, 1920; serial No. 355,089.

Publications Received

Magnitude of the Power Plant's Chimney Loss—Uehling Instrument Co., Paterson, N. J. Bulletin No. 220. Pp. 7; 6 x 9½ in. Charts and tables.

Relation Between CO_2 and Money Wasted Up the Chimney—Uehling Instrument Co., Paterson, N. J. Bulletin No. 221. Pp. 11; 6 x 9½ in. Charts and tables.

Outspinning the Spider—Robert L. Stillson Co., New York City. Pp. 137; 6 x 9½ in. This book, written by John Kimberly Mumford, gives the history of wire-rope making in this country from the beginning of the industry in 1840 by John A. Roebling Sons Co., together with other interesting facts concerning the industry.

Miners' Safety and Health Almanac—Department of the Interior, Bureau of Mines. Pp. 51; 6 x 9 in.; illustrated. Published in co-operation with the United States Public Health Service for the use of miners.

Trade Catalogs

Diamond Core Drills—E. J. Longyear Co., Minneapolis, Minn. Bulletin No. 16. Pp. 18; 6 x 9 in.; illustrated. Description of diamond core drills manufactured by this company.

Jeffrey Coal and Ashes Handling Machinery for Boiler Houses—The Jeffrey Mfg. Co., Columbus, Ohio. Catalog No. 345. Pp. 19; 7½ x 10½ in.; illustrated. Describes twelve distinctive types of power-house equipment.—Advertiser.

Jeffrey Portable Car Unloader—The Jeffrey Mfg. Co., Columbus, Ohio. Bulletin 360. Pp. 8; 7½ x 10½ in.; illustrated. For unloading coal from hopper-bottom railroad cars.—Advertiser.

"Durable" Duplex Pumps—Dean Bros. Steam Pump Works, Indianapolis, Ind. Catalog No. 107. Pp. 68; 6 x 9 in.; illustrated. Describes its various pumps, with tables and directions for setting up and running pumps.

Callite Castings—Calorizing Company of Pittsburgh, Pittsburgh, Pa. Bulletin No. CT-1. Pp. 4; 8½ x 11 in.; illustrated. Describes the use of these castings in high temperatures.

High Tension, Unit Type, Outdoor Substation Equipment—Delta-Star Electric Co., Chicago, Ill. Bulletin No. 37. Pp. 64; 8 x 10½ in.; illustrated. Describes high-tension outdoor substations.

Aristos "Copperweld" Wire for Series Lighting Circuits—Copper Clad Steel Co., Rankin, Pa. One page giving technical data and tables.

Aristos "Copperweld" Signal Wire—Copper Clad Steel Co., Rankin, Pa. One page giving technical data and tables.

Association Activities

Monongahela Coal Association

George S. Connell, of Connellsville, and A. Q. Davis, of Uniontown, have been elected directors of the Monongahela Coal Association, an organization formed by West Virginia coal operators in the territory south from the Pennsylvania state line to Fairmont. The officers of the association, which will have headquarters in Morgantown are: W. E. Watson, Fairmont, president; B. M. Chaplin, vice-president; J. B. Hanford, treasurer, and Harry C. Owen, acting secretary. All of the officers with the exception of Mr. Watson reside in Morgantown.

West Kentucky Coal Bureau

The bureau, which represents members of two of the western Kentucky operators' associations, held its annual meeting in Louisville on Jan. 10, at which time M. B. Lanier, of the Norton Coal Co., Nortonsville, Ky., was elected president to succeed Frank D. Rash, of the St. Bernard Coal Mining Co. Clarence M. Martin, of the Greenville Coal Co., Greenville, Ky., was elected vice-president, succeeding C. W. Taylor, Greenville. C. E. Reed, Louisville, was re-elected secretary-manager.

J. Van Dyke Norman, counsel for the association, made an interesting talk on the work of the bureau during the year, and the progress shown in securing equitable rate adjustments, which had opened up several new selling districts for the members. Following the business sessions there was a dinner at the Seelbach Hotel.

Pittsburgh Coal Producers' Association

O. A. Blackburn was re-elected chairman of the executive committee of the association at the annual meeting held recently in Pittsburgh. The custom of the association is to give each chairman two terms of a year each.

Obituary

Jesse M. Harmon, president and general manager of the Utah Timber & Coal Co., Provo, Utah, died recently at the age of 53. Deceased was one of the most prominent men in Utah County.

Arthur K. Knotts, aged 60, for twenty years engaged in the insurance, real estate and coal business, dropped dead last night in the lobby of the Central Hotel, Uniontown, Pa. He was a native of Greene County but had lived in Uniontown since 1880. He was one of the organizers of the Eureka Coal & Coke Co.

Coming Meetings

American Institute of Electrical Engineers will hold its midwinter convention in New York City, Feb. 15, 16 and 17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Institute of Mining and Metallurgical Engineers will meet on Feb. 20 to 23 in New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

Canadian Institute of Mining and Metallurgy will hold its annual meeting March 1, 2 and 3 at Ottawa, Canada. Secretary, G. C. Mackenzie, Drummond Building, Montreal, Quebec, Canada.

Southern Appalachian Coal Operators' Association will hold its next meeting Feb. 10, 1922, at Knoxville, Tenn. Secretary, J. E. McCoy, Knoxville, Tenn.

Pittsburgh Vein Operators' Association of Ohio will hold its annual meeting on Feb. 13, 1922, at Cleveland, Ohio; D. F. Hurd, secretary.

Rocky Mountain Coal Mining Institute will hold its next meeting at the Albany Hotel, Denver, Col., on Feb. 20, 21 and 22. Secretary-Treasurer, F. W. Whiteside, Denver, Col.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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Check Off One Doubt

INTEREST in Washington now centers in the hearing before the Interstate Commerce Commission regarding railroad rates; in the outlying parts of the country chief interest is manifested in the possibility of a strike of the union coal miners next April.

But one conclusion regarding the final action of the commission in regard to rates can as yet be safely and surely drawn. It is a conclusion that should be widely and loudly broadcast throughout the land. It is that there will be no reductions in freight rates until April at the earliest. There may be reductions then or later, or there may be none. There may be reductions on some commodities and not on others. There may even be increases on some, but not on coal. But no changes can or will be made for two months or more. The volume of evidence to be digested and the importance of the decision preclude any hasty action.

Those who buy coal should have this fact, for it is a fact, firmly fixed in their minds. One reason for hesitancy in entering the market for coal is removed. It is true that there are others, the greatest of which is the possibility of a shutdown of the union coal mines and the interruption of supply, which together with the doubt as to future requirements, which hinge on gains in industrial activity, are certain to influence the character of the coal market this month and next, but two doubts are easier with which to wrestle than three.

Barren Victories

JOHN L. LEWIS, seeing that he is about to meet opposition from the operators and the public and to face further desertion by thousands in the ranks of his followers, turns in despair to the railroad men. He has sent invitations to the officers of sixteen major organizations of railroad employees asking them to confer with him on the wage controversy, and he has received enough acceptances to feel hopeful that some such conference as he has requested will be arranged. Perhaps out of it will come a strike of railroaders and mine workers such as will bring all business to a standstill. Assuming that it comes about, it might conceivably bring victory—but the most barren and bitter of all victories.

During the past year Mr. Lewis has kept union wages in the coal fields up to the highest level attained since the war. Never in the history of mine labor have men received more for a day's work. If that is enough to constitute victory, no one has been more victorious than Mr. Lewis. Unfortunately, the high wage scales have kept the union mine workers idle except in the anthracite field, and the number of union men in the industry during the past year has been continually growing less. The union has become weaker than ever, for idle men, however devoted, can pay no dues. As none of the contracts now being arranged for the new coal year is going to the union fields and as railroads are arranging to buy coal mined not adjacent to their own tracks but contiguous to those of others, it would seem that victory in 1922 would be even more Pyrrhic than in 1921.

Mr. Lewis cannot look to the unionizing of the non-union mines, with a consequent removal of their unequal competition. He can only expect the number of non-union plants to grow and the area they cover to spread if he wins a wage scale such as he is seeking. If all he gains by his appeal to the railroad unions is such a paper scale as gives the form and withholds the substance, he surely cannot mistake what he attains as being victory. He is not a man of narrow vision. He must be looking for something other than this. He surely has seen enough in the last twelve months to have sensed the situation clearly. It would be unjust to the public and the coal operators and those interested in railroads to suggest to them that Mr. Lewis is a fool who wants nothing but a continuance of last year's bituminous wage scale.

It is clear—is it not?—that what he wants is something that will raise non-union wages to the level of present union wages. This cannot be obtained by any other means than some form of national control of mines, ranging from a federal wage board up to complete federal ownership, such as the committee on nationalization under Chairman John Brophy advocates.

This is what he will propose, it would seem, to the officials of the railroad unions, with whom he hopes soon to be in conference. We may well assume something of this sort, or why did John Brophy, of the Nationalization Committee, have such an allowance of time and such attention at the tri-district conference of anthracite mine workers held at Shamokin?

This being apparently the proposition to be presented to the railroad men it is natural to ask how will they receive it. They have tried a federal railroad wage board, and it has not been satisfactory, to say the least, to the workers in the industry. It looked good to them at one time, but it has only resulted in a wage decrease for workers in their industry. Furthermore it will be remembered that they will be asked to advocate such a board in order that men less skilled than they shall be assured larger wages than they are themselves getting. Is is not natural, therefore, to question whether they will accede to Mr. Lewis' suggestions?

In Great Britain the mine workers' excessive demands broke up the triple alliance of miners, railroad men and transport workers. The same result may well occur here also and for like reasons. The railroad men of the United States will be equally wearied by the unreasonableness of their confrères. Deserted by the railroad men, the mine workers of the British Isles nevertheless in large degree won their strike, but the trade conditions were so anomalous that they found themselves entirely unprotected, and the result would not have been different had the railroad men and transport workers entered into a sympathetic strike on their behalf. In this country the setback to business resulting from almost doubling the price of bituminous coal, as will be inevitable if it is to be based on union instead of non-union wages, might well slow down both mining and railroading so that neither would afford sufficiently steady work to protect the employees from starvation.

The demands being made are essentially unsound. They would undermine the very foundations of society, and would end inevitably in the discontinuance of the co-operative bargain. Mr. Lewis will have to write a saner platform before he can hope to win a victory that will be permanent. We cannot but fear that this possibility has not appealed to him, but if he is wise he will see it and if the railroad men are sane they will never consent to plunge with him into a strike that would involve everyone in a disastrous industrial depression.

The presidents of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers, of the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees, and of the Switchmen's Union of North America are among those who have consented to accept Mr. Lewis' invitation of Feb. 1. The president of the Order of Railroad Telegraphers also declares he favors such a conference. It is probable, however, that these men agree to meet solely because by so doing they will exhibit such a solidarity of labor as will make the Federal Railroad Labor Board afraid to concede to the public or the railroad owners the wage reduction which has been asked. Mr. Lewis called attention in his message to efforts being made "to enforce further unwarranted wage cuts on them" (the railroad employees), and their interest may well be more to conserve what they have than to jerk chestnuts out of the fire for the union miners.

Co-ordination or Complication?

INTO the already tangled web of governmental supervision, control and interference with the railroads the United States Chamber of Commerce is this week proposing to inject a new scheme—another body in Washington to do the somewhat indefinitely described thing of "bringing the public interest effectively into every railroad question." The official would be designated the "Commissioner General of Transportation"; he would be nominated by the President, confirmed by Congress and, with his staff, paid by the taxpayers. His duties, according to the proposal of a special committee from the Chamber that has conceived this super-office, would be, to quote in full its published statement:

"To keep himself informed of the transportation needs of the country and make such recommendations as he may find will be for the public interest and that would tend to co-ordinate the administration of laws and that would make possible the articulation and economic use of all transportation facilities.

"To ascertain and report conflicting or inharmonious functions and rulings . . . that cannot be so reconciled by administrative practices as to promote the general development of the co-ordinated system.

"To be notified of all hearings, to be entitled to be heard and to produce evidence that will tend toward a result that will promote and facilitate the continuous development of interstate transportation adequate and efficient to meet the needs of the country.

"To render all possible assistance to the Interstate Commerce Commission in facilitating and advancing the consolidation of railroads.

"To be authorized to grant federal charters to corporations proposing to engage in interstate transportation by land, water or air and to convert state corporations into federal corporations."

There are many who contend it to have been an error to divide responsibility between the Interstate Commerce Commission and the Railroad Labor Board and who advocate their consolidation in order that the functions of setting rates, which determine revenue, and determining wages, which affect income, may be better co-ordinated. We are among those who would prefer to reserve judgment on the Transportation Act in this regard until more time has elapsed and our experience with this dual functioning is more mature. But to jump in now and propose a third body whose duty, as we read the announced program, would be that of co-ordinating these two, would but complicate matters, with no advantage.

The railroads are now circumscribed by the Interstate Commerce Commission, acting presumably in the interest of the rate-paying public, not to mention innumerable state commissions, and by the Wage Board. There are many private organizations representing the shippers, as the National Industrial Traffic League, through which shippers present their ideas, claims and contentions to these governmental bodies. The railroads have their own associations, as have the railroad laborers, to represent them. There may be occasion for such a "predigestor" as the Chamber suggests, but we confess to our inability to envision that need. The interest of the public in the railroads begins and ends with having adequate, uninterrupted service at reasonable non-discriminatory rates. Laws and judicial and administrative bodies have been erected to permit the fulfillment of these ideals. That they do not function perfectly is a consequence of the frailty of the human mind. To install more machinery on such generalizations as the Chamber of Commerce has proposed is unnecessary. It seems as if the Chamber were running out of good ideas.

THE STUDY OF INTERMITTENCY in the coal industry which is to be made by the coal committee of the President's industrial conference will not be launched until after the labor controversy has been settled. The study is to be made in co-operation with the Department of Commerce and Secretary Hoover feels that any government inquiry at this time is likely to be misinterpreted. It is feared that this investigation might be regarded as an effort to gain information for use in meeting the strike situation. With the tension which now exists in the coal industry, it is recognized that it would be difficult to obtain the co-operation necessary for a real study of intermittency.

GEORGE H. CUSHING, managing director of the American Wholesale Coal Association, is preparing a statistical table which will show the tonnage line which divides car abundance from car shortage. While the figures are not complete, his study thus far shows that serious car shortage does not begin to develop until the 10,000,000-ton per week point has about been reached. As the coal movement approaches the 11,000,000-ton mark it begins to interfere to an increasing extent with the movement of other commodities which must be hauled in open-top cars.

SHOVEL LOADING FIVE-AND-A-HALF FOOT SEAM OF COAL AT LITTLE WAR CREEK COAL CO. MINE, IAEGER, W. VA.

How to Handle Mines So as to Get Best Results from The Use of Shoveling Machines in Underground Work

Suitable Physical Conditions and Mining Methods Are Necessary Where Loading Machines Are to Be Successful — Ways by Which Coal Can Be Loaded Free of Partings — Machines Save in Men, Cars and Houses

BY WILLIAM WHALEY
Knoxville, Tenn.

IN VIEW of the fact that coal operators are becoming increasingly interested in the loading of mine cars underground by machine and seeing that these machines are being more and more introduced into coal mines, it is necessary to have a thorough understanding of the requirements for their efficient operation, because their success will depend largely on the way in which they are handled. The remarks which follow are based on the use of Myers-Whaley shoveling machines. The physical characteristics of the coal bed are of prime importance. These will be treated briefly in the paragraphs that follow:

First, the thickness of the coal bed must be such as to afford an adequate net height from the top of the rail to the roof of the mine. The No. 3 machine can be used in a 5-ft. bed. This is the minimum thickness, however, and where machines are employed in such measures the use of steel mine ties, making the height of the rail about 4 to 5 in. above the floor, is considered necessary in order to save height.

The minimum height from the top of the rail to the top of the conveyor belt on this machine is 3 ft. 8 in., which gives a clearance between the top of the conveyor belt and the roof of the mine for the passage of lumps of coal of 11 in. The conveyor should clear the side of the car from 6 to 12 in. and for coal 5 ft. thick the top of the car should, therefore, be not over 30 in. above the rail. Fig. 1 shows a cross-section of a suggested car for use in coal 5 ft. to 5 ft. 6 in. thick.

The character of the coal—that is, whether it is tough and hard to shoot or shoots freely and comes out in a mass that is readily shoveled—also must be considered. If the coal is extremely tough and has a tendency to stand after shooting, experiments should be made to determine the proper kind of cut and the best method of drilling and shooting the coal so as to free it without breaking it up too much for the market. The best method of doing this is by trying different methods and keeping records of the results. It is highly desirable that the coal be prepared in such a way as not to delay the loading.

It is expected that the preparation of shots yielding results best suited to mechanical loading will in some instances require more labor than if hand loading were practiced. This extra work in the preparation of the shots will, however, be more than offset in the loading costs. A well-prepared shot will result in an increased tonnage being shoveled in a given time. It also will obviate the necessity of keeping men in front of the machine to pull down the standing coal.

The snub cut may be made directly by a cutting machine designed to produce in one operation a high or wedge-shaped kerf. The same result may be obtained also by a two-stage cut—that is, making first the ordinary flat cut on the bottom, and then the snub cut proper by raising the cutter bar and tilting it forward and downward. The snub cut may be produced also by hand picking. It may be found most advantageous to

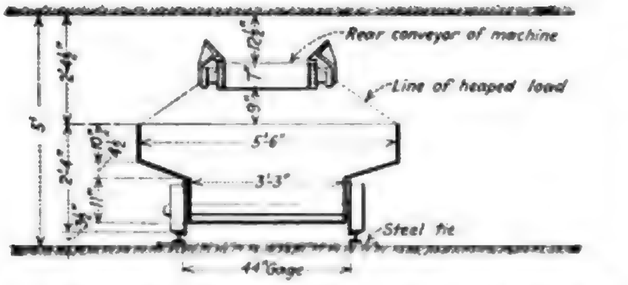

FIG. 1. SUGGESTED SECTION FOR CAR TO BE USED FOR MACHINE LOADING A FIVE-FOOT SEAM

Note in particular the elevation of the rear conveyor of the loader. At the point of discharge, room is provided for 12 in. of coal bed. The level capacity is 72.7 cu.ft. and the heaped capacity 102.7 cu.ft.

drill preliminary holes for light snub charges of explosive, or to follow other methods that will suggest themselves to the experienced mining man. See Fig. 3.

Cutting machines in many instances leave several inches of coal on the bottom that may be cut loose by the miner. This process, called "scrapping," may constitute a large proportion of the labor involved in loading the coal into the pit car.

Unless the coal bed is firmly cemented to the mine floor the shoveling machine will take up this material and load it with the mass of loose coal. It is only necessary for the shovel operator to lower the scoop to the proper point to reach this layer of bottom coal.

Where this scrapping must be done after the loading of the loose coal it may be accomplished by means of hand picks or with air- or electrically-driven punching machines. It is more advantageous, however, for the cutting-machine men to take the necessary pains to keep the cutter bar down and tilted slightly forward so that the machine makes its own bottom without the necessity for scrapping. In such a case successive cuts will show no tendency to climb upward into the seam of coal.

Partings in the seam also must be considered. Are these partings of dirt or slate? Can the parting material be readily distinguished from the coal? At what point does the parting occur? If near or below the middle of the bed it is practicable to use a machine that will either cut in the parting itself or just above it and shoot the top bench of coal, which will come out clear of the lower bench. This may then be loaded out after which the parting may be loosened and shoveled either into cars or into the gob at the sides. The bottom bench may then be shot and loaded.

This, of course, entails more time than does loading from a clean bed of coal and proportionately reduces the tonnage that can be loaded in a given time. This procedure, however, can be economically followed if circumstances demand. Should the parting be of such nature that it can be readily picked out underground it may be well to shoot down the entire face and have the parting picked out and gobbed by hand while the machine is working.

A still more advanced method of dealing with coal-carrying dirt partings would be to design outside equipment at the tipple to separate the dirt from the coal before it is loaded into railroad cars. This, of course, might necessitate large slate-disposal facilities. The proper method or that best adapted to handling the parting should be carefully worked out before machines are installed. Fig. 2 shows one of several practicable methods of handling a parting.

In considering shoveling machines of the Myers-Whaley type it should be borne in mind that the grade of the track should not exceed 7 or 8 per cent, as the machine will not operate with best results upon a greater inclination. If the bed of coal is pitching steeply, it will be necessary to work the machines across the pitch, and if the slope is such that these machines cannot clean up on either side, then some type of loading apparatus should be employed.

The transportation of coal from the machines to the outside of the mine has a vital bearing upon both tonnage and economy. The transportation system must be planned so that it can take care of the large quantity of coal which the concentration in production will afford. For instance, a shoveling machine loading at an average rate of one ton per minute has only forty minutes of actual work in a room in producing forty tons. Every minute used for shifting cars or consumed in waiting for them adds to the time necessary to clean up the place. Such a room, with good car shifting, should be cleaned up in an hour and a half. This feature of transportation is one which will repay the closest study and most careful consideration.

CARS SHOULD HOLD AT LEAST THREE TONS

It is essential also to use mine cars as large as can be readily handled. Cars that will hold a minimum of three tons are recommended, and they should be even larger in thick beds of coal. Such cars should be built low and wide, their over-all length ordinarily being limited to approximately 10 ft. Fig. 1 illustrates a good type of car for machine loading.

The system of trackage employed in rooms as well as in development work should be carefully planned, bearing in mind always the necessity of arranging for a quick shifting of cars. There should be a track for each 16 ft. of width in each working place if the No. 3 size of machine is used, and for each 19 ft. of room width for the No. 4 size machine. Rails for the No. 3 size machine should weigh at least 24 lb. per yard,

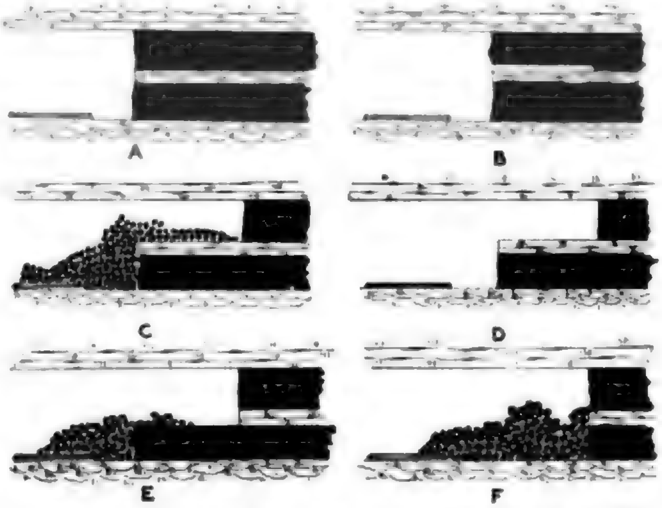

FIG. 2. METHOD OF MINING A SEAM HAVING A DIRT BINDER NEAR THE CENTER

A shows a room cleaned up and a shallow track laid to within 8 ft. of the back of the machine cut or, where the cut is 6 ft. deep, within 2 ft. of the face. *B* shows machine cut made just above the dirt parting. *C* shows the upper bench shot out and raked onto the floor from the top of the parting, ready to be loaded by shoveling machines. *D* shows the face after the top bench has been loaded out. The parting can now be shot loose or pried off with bars. If the bottom was shot at the same time as the top the parting will be broken and easy to load. *E* shows the dirt parting broken up and raked onto the mine floor ready to be loaded by the shoveling machine. *F* shows the lower bench shot loose and ready to be shoveled by machine. If the lower bench was shot at the same time as the upper, no shooting later will be necessary.

and for the No. 4 machine 30 lb. per yard. Fig. 4 shows a common arrangement of track for room work.

Machines can be advantageously employed in either the room-and-pillar or the longwall system of mining. In long face work the tracks can be laid parallel with the face and the cars moved in a trip under the rear conveyor. This arrangement is capable of developing the largest possible capacity from shoveling machines. In considering the adoption of longwall mining, much, of course, depends upon the character of the coal bed. It logically comes within the province of the mining engineer to determine whether this system is practicable. Fig. 5 shows the arrangement for longwall loading.

Division Into Districts Facilitates Operation

To facilitate operations as far as possible, I would suggest the organization of a mine into districts in such a way as to give each shoveling machine a territory that will produce enough coal to keep it continuously employed at its average rate of production. In a district where the rooms produce approximately 40 tons each, about six rooms should be allotted to a machine. A cutting machine also should be allotted to this district, and the organization would comprise the cutting machine and its crew, the drilling and shooting crew, the track crew for advancing tracks, the loading machine and its crew and a gathering locomotive for moving cars to and from the machine.

This would be considered a unit outfit, and there should be as many such units as are required to produce the desired tonnage from the mine. It is not practicable to give an outline of an organization that would be suited to all circumstances. One adapted to certain specified conditions may, however, be presented.

Accordingly, an outline of such an organization intended for use with loading machines in a bed of coal 5 ft. 6 in. thick, using chain undercutting machines and No. 3 size of shoveling machines, is herewith submitted. It is assumed that the coal is of a character that shoots readily and does not stand after shooting, has no partings and that the grades are not over 5 per cent. A track gage of 42 in. and cars 36 in. above the rail and holding three tons have been also assumed.

Equipment and Personnel of a Unit

The equipment for such a unit would be as follows: A cutting machine, a drilling machine, a gathering locomotive and a shoveling machine. The personnel of the unit would be: A trackman, who also is the unit foreman; a trackman's helper, a cutting-machine operator, a cutting-machine helper, a locomotive runner, a locomotive brakeman, a drillman, to drill, charge and shoot the coal; a drillman's helper, a shoveling-machine operator, and a shoveling-machine helper, making a total of ten men.

This unit would cut, shoot, load and place on the main haulway approximately 200 to 250 tons of coal per 8-hour shift. The cost would depend upon local rates of pay for the above work.

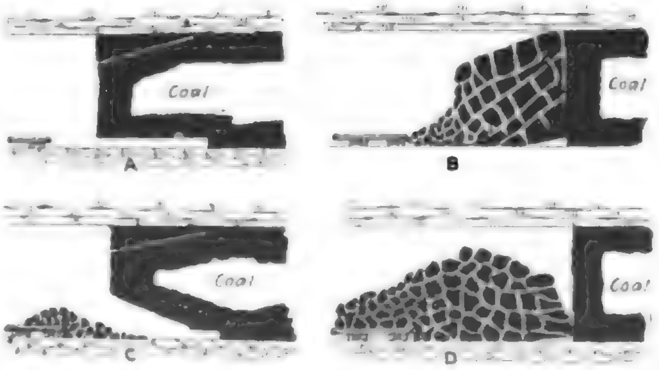

FIG. 3. MINING COAL SO AS TO AID IN PREPARATION

A and *B* show a shallow undercut and a light charge which gives an annoying "standing shot" which has to be pulled out from the face or popped, making as much fine coal as if shot properly in the first instance. The shovelling machine will load this shot with less breakage and more lump than will hand loading but the speed is less than with a well-tumbled shot as shown in *D*. Compare *B* and *D*, where, as a result of a "snubbed" undercut such as is shown in *C*, a greater percentage of lump is obtained, the coal breaking on the natural planes of cleavage without the formation of dust. The shot is easily and quickly loaded, but the snubbing of the coal involves some expense.

Each unit should have one butt entry and air course together with the crosscuts between them and the requisite number of rooms and room necks. Such a unit should drive its own development work on this entry at the same time that it is loading coal from the rooms. Assuming that entries are 10 ft. and rooms 32 ft. wide, turned on 60-ft. centers, with crosscuts between entry and air course every 80 ft., and that a 6-ft. cut is taken each day in both entry and rooms, there would be six rooms going or started and the total number of working places at any one time would be:

One airway	10 ft.
One haulway	10 ft.
One crosscut	10 ft.
One room neck	10 ft.
Five rooms	160 ft.
Total	200 ft.

Thus a total length of face amounting to 200 ft. must be undercut, shot and loaded out each day. About 220 tons of coal per day can be procured from this territory. Rooms would be driven up about 300 ft., so that the entries would advance at the same speed as the room work, one new room being developed as an old one was completed, thus keeping the development at the proper distance ahead of the room work. Rooms should be widened in such a way that the loader can reach all the coal, two tracks being used after full width has been attained. These will be spaced about 8 ft. from each rib. Breakthroughs should be at an angle of about 60 deg., in order to facilitate track work and loading. Fig. 4 illustrates two adjacent rooms of a unit of this kind operated as above described.

A unit of this type uses fewer cars than would normally be required for the tonnage obtained. Loading 220 tons per 8-hour shift in 3-ton cars means seventy-three carloads of coal, or about nine cars per hour. Assuming that the main haulage locomotive delivers cars in trips of nine each to this unit, a trip of loads is taken out each hour and a trip of empties returned. It may be considered also that a trip is continuously on the tipple or in transit. Thus the total number of cars per unit would be twenty-seven.

Hand loading of an equal tonnage would require about twelve working places, these consisting of ten rooms and two entries. Each room would contain two cars being loaded, and each of these two cars would require about 4 hours for filling—that is, each car would make not over two trips per day. With nine cars on the tipple track, the total number of cars required would be fifty-three. Machine loading, therefore, saves an investment of twenty-six cars per machine unit. These, at $175 each, represent the sum of $4,550.

A lessened investment in houses also is made possible. For machine loading each unit would employ in all ten men. To load an equal tonnage by hand at least twenty-two men would be needed. If we figure one house for every two men, only five houses are required per unit for machine loading, and eleven houses for hand loading, making a possible saving of six houses. Assuming that these dwellings cost $1,500 each, the saving in the investment for houses amounts to $9,000 per unit.

From the above analysis it would appear that the initial investment in a machine-equipped mine will not be as great as in a hand-loading operation. In fact the possible saving in houses and mine cars alone is greater than the investment in machines. Many other economies, however, may be effected by the use of machine loading. Some are so intangible that they cannot be estimated with accuracy, but all have their bearing upon the total cost of production. I enumerate below the cost elements susceptible of reduction by this means. The saving possible on each individual item the experienced mine operator will be able to judge for his own conditions.

Thus savings may be made in the cost and in the rapidity of development, in the reduced number of cars needed for any given tonnage, in trackage, haulage, and ventilation because of a reduced territory, in houses because fewer men are needed, in the division of the mine into districts with unit organizations in each, in the cost of loading coal into mine cars, amounting to approximately 50 per cent of the cost of hand loading. A better class of labor will be obtained and freedom enjoyed from labor troubles.

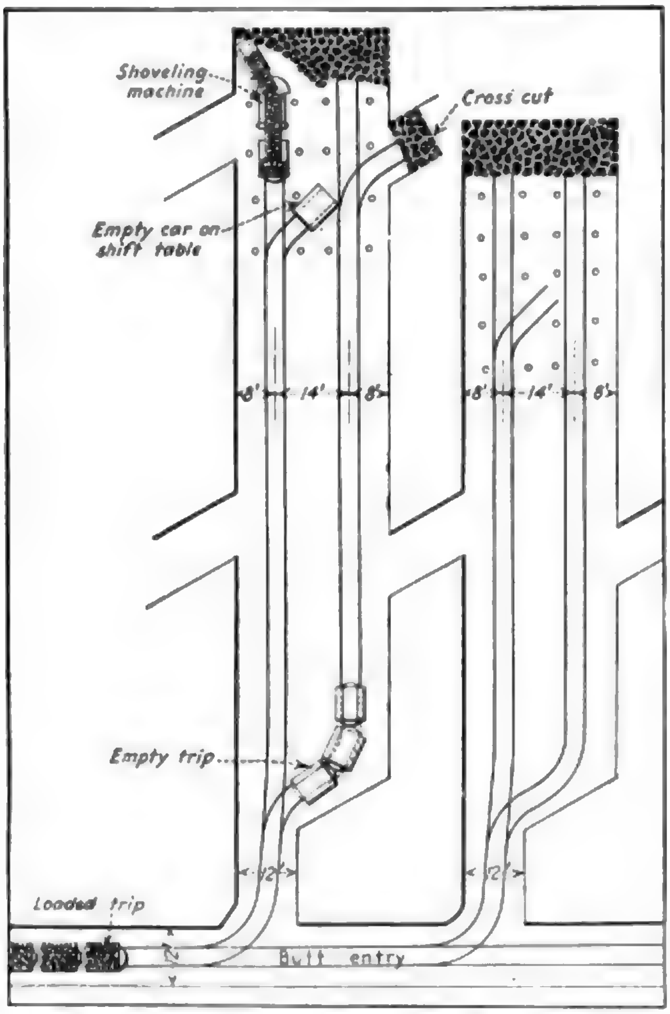

FIG. 4. METHOD OF HANDLING CARS AND TRACK

An empty car is kept on a climb-over switch just behind the shovel. It is placed either by a mule or a gathering locomotive. An empty trip of cars for the purpose is kept on the main track or on the side track of the room, depending upon whether the loading machine is working on the side or main track. The coal from the crosscuts is loaded out by machine as is the coal in the room face. When the coal is undercut the track is advanced to within 2 ft. of the face and the coal is shot down on it.

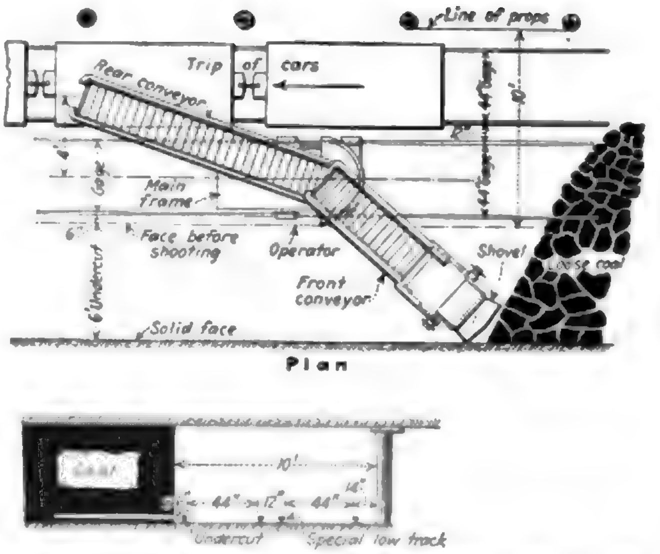

FIG. 5. SHOVEL CLEANING UP A LONGWALL COAL FACE

If the props are set 10 ft. clear of the line of the face before shooting and 16 ft. from the line of the face after shooting, there is room for both the shovel and a trip of cars, the gage of the shovel and of the cars alike being 44 in.

In addition to these advantages, mechanical loading secures to the operator that highly desirable factor in coal mining, namely, flexibility of production. It will be recognized that where a considerable and sudden increase or decrease in output is desired it will be a simple matter to regulate production by adding more machines or suspending the operation of some, as the situation may demand. On the other hand, the machine equipment may be double- or triple-shifted if an emergency so require. Where an unwieldy force of strictly hand labor is employed this flexibility of production is obtained only with great difficulty, and where possible at all, it is so slow or is obtained in such small degree that no adequate advantage can be taken of any sudden and fleeting opportunity to meet an unusual and advantageous market demand.

At the present time (1921), as previously stated, the type of machine here considered is being manufactured in two standard sizes. These possess the following salient characteristics:

The smaller size weighs about 13,000 lb., has a minimum height from rail to top of conveyor belt of 3 ft. 8 in., is about 22 ft. long, cleans up a space 16 ft. wide and can be used satisfactorily in beds of coal not less than 5 ft. thick. It has an average capacity of 50 to 60 tons per hour of actual shoveling time.

The larger size weighs about 18,500 lb., has a minimum height from rail to top of conveyor belt of 4 ft. 7 in., is about 26 ft. long, cleans up a space 20 ft. wide, and can be used satisfactorily in coal beds not less than 6 ft. 4 in. thick. It has an average capacity of 60 to 70 tons per hour of actual shoveling time.

These two machines are identical in general design and arrangement of parts, as well as in operation. Both are standardized and have interchangeable parts. The machines are built for heavy, continuous service, not only in coal but in handling iron and other heavy ores, as well as for use in rock and tunnel work. The coal machines thus can be used for cleaning up rock falls, lifting bottom, driving drifts and the like. This is particularly advantageous during development and mine opening.

Specification Systems Should Not Be Permitted to Eliminate Judgment in Coal Buying

Varying Factors of Many Buyers' Requirements Not Reducible to Mathematical Formulas — Ignorance of Coal Sellers as Well as of Buyers Responsible for Inaccurate Claims — Is a Universal Standard Possible?

By Gerald B. Gould*

WITH the return of competitive conditions in the coal market there naturally is a revival of interest in the matter of buying coal under specifications, which was slowly but steadily making headway up to about 1915. The greatest weakness in any such movement is the tendency to think too much of the form and too little of the substance of the matter, to expect a mechanism to act as an automatic substitute for judgment in selection and skill in negotiation.

There was a time, not so long ago, when efficiency was synonymous with some "system," when to many minds the "system" was more important than the results. System became a cult, and in many other fields besides business the followers of a cult have offered universal cures for all ills. The worship of a mechanism led us to many excesses of systemization. But out of it all has come much good—many improvements of great value to business. But also from it has ultimately come a higher respect for some of those old fundamental forces which our pioneer grandfathers understood, a better valuation of those qualities of judgment, skill, leadership, pride of accomplishment, and desire for self-expression—purely human qualities which, after all, furnish the backbone to successful enterprise.

Coal Buying an Art; Not a Science

And so it is with coal buying, which is and always will be an art rather than a science, although it involves several branches of science. The danger is that we may overvalue a *system* of coal buying, to the neglect of the art itself. The most successful coal buyer equips himself with all the facts, and then by the exercise of judgment, he reaches a decision involving the balancing of many varying factors the relation of which to his particular requirements cannot possibly be reduced to a mathematical process.

The vast majority of coal buyers have available to them several hundred different coals, offered by as many producers or dealers. Each of these coals differs from all the others in (1) its average heat value, (2) its volatile, (3) its sulphur, (4) its fusing point, (5) its price. In addition there are differences in physical characteristics, such as size and coking qualities, in uniformity of quality, as well as differences between dealers and producers in respect to their business standing and reliability, and ability to fulfill an agreement.

Then there are the peculiarities of one's own plant, which must be considered in relation to all these other variables; and these peculiarities are not all mechanical either. The successful coal buyer is one who knows how to get at these facts and how to balance them, giving the proper weight to each one for his own particular requirements. If a coal buyer is adequately informed and qualified to judge of the facts, the use of specifications is scarcely more than a detail of procedure. If he is not sufficiently informed, then, as we shall try to show later, he is not in a position to use specifications safely. The machine may produce some unexpected and unhappy results, just as an automobile in the hands of a novice may perform some very undesirable maneuvers.

It may seem superfluous to inquire into the purpose which coal specifications are intended to serve, but the more opportunity one has to observe the practical effect of specifications, the more closely he finds their success or lack of it is related to the present state of the art of coal buying.

Buyers Deficient in Coal Knowledge

There is plenty of evidence, which cannot be presented in an article of this length, to show that the majority of coal buyers are not anywhere near adequately informed as to actual coal values, and the majority of producers and dealers are either uninformed or misinformed as to the actual quality of the product they are selling. A careful study of the average delivered quality of some 2,000 bituminous coals produced in Pennsylvania, Maryland and northern West Virginia shows that the percentage of coal averaging under 10 per cent ash and 1¼ per cent sulphur in each of the three main divisions of this field are as follows: Low volatile, 25 per cent; medium volatile, 7 per cent; high volatile, 8 per cent.

If any coal buyer will take these figures, which have been derived from the actual tests on some 30,000 deliveries of coal from this field, and compare them with the claims to be found in his file of coal offers, he will find proof of the statement just made regarding the prevalence of misinformation or ignorance as to actual coal values in the coal trade. It is not so much a matter of conscious misrepresentation. One can be inaccurate without being untruthful.

Inexact Claims as to Coal Quality Persist

It should be remembered that the scientific measurement of coal values is really only in its infancy. It is characteristic of any such movement that traditional conceptions yield very slowly in men's minds to newly discovered facts, no matter how unfounded the traditional idea may be. Anyone who would see clearly the problem of coal buying in its broader aspects must take into consideration this state of mind, which is just as real and just as important a fact as are the facts about coal quality. The prevalence of inaccurate claims as to coal quality and the persistence of this condition in itself shows that the majority of coal buyers also are inadequately informed. An enlightened, intelligent and discriminating buying public will automatically bring home to the producer of any commodity the necessity of accurate branding of his goods.

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It is a significant fact that you can take any group of ten or twenty coal offers, and find upon careful analysis of the values offered that price bears no determinable relation to quality. Through fifteen years of experience, in the course of which thousands of such groups of bids have been analyzed, there has not been an exception to this general condition. It is, of course, true that some good coals are sold at higher prices than some poor ones, but the exact reverse is just about as likely to be found.

It must be remembered that a scientifically accurate determination of value is useless unless a sufficient number of people believe it. What coal buyers *think* about a coal is of more weight in determining its market value than are the facts, until the facts become accepted by a sufficient number of people. If an uninformed buyer *thinks* a coal has 6 per cent ash, when it actually has 14 per cent, he is certainly guided by what he thinks, and acts accordingly. This, of course, is obvious, but the importance of it is that the present lack of relationship between prices and values could not exist if the majority of coal buyers were actually guided by reliable information.

Bringing Price and Value in True Relation

This is not intended as an indictment or a criticism of either coal producers or coal buyers. It is merely a statement of a condition which does exist as a necessary step in the development from an utterly uninformed undiscriminating condition to an approximation, at least, of the condition which other basic commodity markets have already reached, where values and prices have become related as a result of better, more accurate and more generally distributed information. It is not a matter of morals, or ethics, or intelligence, but merely a stage in the evolution of an extremely intricate, far-flung basic market.

If *A* sells coal, which in a scale of 100, we will say, is worth 90, at $2.50, and his customers are satisfied, while *B* is selling a coal which we will rank at 98, for $2.25, certainly *A* is under no moral obligation to take less. He is under no obligation to hunt up for his customer some better proposition offered by a competitor. If a coal producer honestly but inaccurately tells a customer his coal will average 6 per cent. ash, when it really is nearer 10 per cent., and if the customer is satisfied to accept that as his only measure of value, there is no incentive to the coal dealer to spend time and money to carefully investigate the matter of his coal's value, especially when he believes he already knows it.

There is a further disadvantage in this situation to the consumer as a class, in that the producer of the best product often does not get as much as he should in proportion for it. It is discouraging to the man who already produces a superior product, and eliminates the incentive there should be for others to improve their quality. It is, of course, true that the minority, and it is very small, of the coal buyers who are adequately informed are able to take advantage individually of the illogical price relationships created by the uninformed majority. That, however, is a legitimate business opportunity which operators in every market who are better informed make out of conditions created by the less well informed majority. As the informed majority grows prices are stabilized and brought into truer relation with actual values.

But what, you are probably saying, has all this to do with coal specifications? First, we should understand the fundamental conditions before we attempt to modify or add to them by introducing a method which while not new has never been widely used. In the second place it is worth while to inquire as to whether the demand for specifications does not grow out of a gradual awakening among buyers of the very conditions already outlined, out of a feeling of growing dissatisfaction with the uncertainties inherent in coal buying as it is generally practiced. And third, if the foregoing is true, it may give us an indication of what specification buying is intended to accomplish, and whether or not specifications are really what is most needed at this stage in the development of the art of coal buying.

The question is not as to the validity of the theory of definite specifications for coal or for any other commodity. The principle of having a definite agreement between buyer and seller as to quality and quantity is absolutely sound. To get back to the simile of the automobile, there is no question about the desirability of having one, but the problem is to build one that actually runs and that you can drive without getting hurt or without hurting somebody else. And you might add that it is worth considering whether the roads at present available are good enough so that you can drive over them without too much discomfort, or without too many breakdowns.

Specifications Must Undergo Evolution

It is true, of course, that somebody had to first build a feeble, wheezy, "one-lung" automobile, before our great automobile industry could be built, but it is also true that it took fifteen or twenty years of costly development to produce the reliable, comfortable motor car of today. Coal specifications have been made to run, and to do so smoothly and to the mutual satisfaction of buyer and seller, *under certain circumstances*. Some form of specifications will without doubt eventually be in general use. But it is not going to come over night. Continued thought, discussion and experimentation is to be encouraged, but the problem should be approached with wholesome respect, and without any illusions about immediate results. Otherwise there will be unnecessary discouragement and unnecessary obstacles will be introduced by those who are trying hardest to solve the problem.

There is danger in experimenting with this mechanism called coal specifications, because it is made of only paper and ink and words. There are no wheels to go round. You don't know at times whether it is running or not unless you hit some bumps, and then the lack of springs and upholstery becomes painfully apparent. Perhaps the exact place specifications can properly occupy in coal buying can be made clear by inquiring into the most important single feature of them: the standard of quality.

The idea of coal specifications today implies a variable settlement price, which depends upon the actual quality of the coal delivered in relation to some "standard" which is agreed upon. How is that standard to be determined? Is it possible to establish a universal standard coal—an ideal coal—from which the relative value of all coals can be mathematically determined?

Whether the standard is to be an ideal coal or not, a universal standard is an impossibility in the United States and particularly in the Eastern states, which have available coals of more diverse characteristics than any large coal consuming area in the world. If it were only a matter of heat value, it would be simple to establish a mathematical relationship. And such a relationship can form the basis of determining relative values as between coals having in other respects substantially the same characteristics. To illustrate, assume two coals of equal heat value, but one of them having a fusing point of 2,400 deg. and the other 2,800 deg. Now a plant which could use the 2,400 deg. coal satisfactorily could not afford to pay more for the 2,800 deg. coal, although this latter coal has a higher intrinsic value and in a normal market would bring a higher price. On the other hand, if a plant needed a coal having a fusing point of 2,800 deg., it could not afford to take the 2,400 deg. coal at any price. Either a coal in this respect is satisfactory for the particular requirements of an individual buyer or it is not, and there is no adjusting the difference by any arbitrary scale or mathematical formula.

The same thing is true of volatile. Assume that the buyer operates a plant in a large city in which smoke ordinances are strictly enforced. And suppose that his equipment is such that it is difficult or impossible for this plant to avoid objectionable smoke with coal which has more than 20 per cent. of volatile matter. There is no way to establish any definite relationship between a 20 per cent. volatile coal and one having 30 per cent. as far as its value to this particular consumer is concerned.

In some plants, because of a combination of plant characteristics and load requirements, a certain minimum heat value is essential, while in other plants it is not so important. Sulphur has a certain but not very closely defined relation to the fusing point. It is supposed to have some relation to the likelihood of spontaneous combustion. It has some other deleterious effects, on which no one has yet succeeded in placing a money value. We do know that low sulphur coals are preferable but the difference in value between a 1 per cent. sulphur coal and one having 2½ per cent. will differ with individual consumers.

Then there are physical characteristics. In the case of screened coals there is the question of the percentage of fines. In one plant this may have a more important bearing than in another. There are other characteristics which must be considered at times, but it is unnecessary to go further to demonstrate the impossibility of establishing a universal standard on which relative values can be based.

National Mining Institute Will Present Twelve Papers on Coal-Mine Operation

HOWARD N. EAVENSON will preside at the mining session of Wednesday, Feb. 22, of the annual meeting of the American Institute of Mining & Metallurgical Engineers, at which the following papers will be presented: "Bituminous Coal Mining," by T. H. Clagett, chief engineer, Pocahontas Coal & Coke Co., Bluefield, W. Va., with carefully elaborated discussion by H. S. Gay, Jr., general superintendent, Mount Gay, W. Va., who has devised an interesting method of operation; Frank Haas, consulting engineer, Consolidation Coal Co., Fairmont, W. Va.; M. F. Peltier, vice president, Peabody Coal Co., Chicago, Ill.; Erskine Ramsay, consulting engineer, Birmingham, Ala.; Edward H. Coxe, general manager Snowden Coke Co., Pittsburgh, Pa., and Edward Newbaker, Philadelphia, Pa.

D. C. Ashmead will present his paper entitled "Can Anthracite Mines Be Operated Profitably on More Than One Shift?" and H. H. Stock one on "Considerations Affecting the Extraction of Bituminous Coal in American Mines."

Other interesting papers at that meeting will be one on the "Underground Fire Prevention of the Anaconda Copper Mining Co.," by E. M. Norris, and one on "Mine Fires and Hydraulic Filling," by H. J. Rahilly, mining engineer of the same company at Butte, Mont.

At the mining session of Tuesday the leading paper will be "Storage-Battery Locomotives as Applied to Mine Haulage," by Charles E. Stuart, an exceptionally interesting paper. At the joint session of the institute with the National Safety Council, presided over by B. F. Tillson and H. F. Lunt, Rudolf Kudlich, assistant to the chief mechanical engineer of the Bureau of Mines, Washington, D. C., will present an article entitled "Safety Devices in Mine Shafts," and R. M. Raymond, professor of mining engineering, Columbia University, a paper entitled "Safety Practice for Hoisting Ropes." There will be three other articles on hoisting.

J. J. Walsh in the Safety Session of Feb. 21, which will be on Ventilation, will discuss the coal-mining phase of that subject. Three other papers will be presented on the ventilating of mines.

Other sessions will be held on "Ground Movement and Subsidence," "Breakage and Heat Treatment of Drill Steel," "Foreign Oil Possibilities" (two sessions); "Petroleum and Gas" (two sessions); "Mining Methods" (Iron and Copper); "Industrial Relations," "Non Metallic Mining," "Waste in the Mining Industry" (in conjunction with the Mining & Metallurgical Society), "Metals" (three sessions), and "Iron and Steel" (two sessions).

A smoker will be held on Monday evening, theater parties on Tuesday, and a banquet on Wednesday will fill up the round of amusement. For Thursday several excursions are planned for different parties, one to the Crucible Steel Co.'s plant, another to the Bayway plant of the Standard Oil Co., and a third to the Chrome plant of the U. S. Metals Refining Co.

In the afternoon the Pardee Steel and the Pardee Tile Works will be visited by one party, either the Chesebrough Manufacturing Co. or the Barber Asphalt Co. will be viewed by another and either the Standard Underground Cable Co. or the Raritan Copper Works will be inspected by a third. An interesting four-day program has been prepared for the ladies attending the Institute.

THE UNIVERSAL GAS MASK has been fully developed for protecting the wearer against all poisonous gases not exceeding 2 or 3 per cent concentration in air where a safety lamp will burn, the flame showing that enough oxygen is present to support life. Universal gas masks weigh 8½ lb. and give a maximum time of protection. A fireman's gas mask also has been developed which has a smaller canister, weighs only 5½ lb., is less cumbersome than the universal mask, but has a shorter life. Tests of the universal mask are being made in actual use, after which complete specifications will be given. At the request of the Navy Department the Navy gas masks have been tested by the Bureau of Mines for protection afforded in fire fighting.

IN AN ARTICLE entitled "Is a Coal a Mineralized Peat Bog," etc., Jan. 5, p. 9, appear the words "It has also been observed that when the roof of a coal bed is composed of black slate the roof is thicker than when it is composed of sandstone." The words "the roof is thicker" in this sentence should have read "the coal is thicker." In the caption of the upper illustration on page 1010 of the issue of Dec. 22, "4-in. water gage" should be "1-in. water gage."

Telephone Circuits in Shafts Should Be Independent; Safety Precautions Taken at Pettebone Colliery

To Connect Telephones of Top and Bottom Cagers and Hoist Engineer to the Main Line Is Dangerous Practice—Keep These Instruments on an Isolated Circuit Until Necessity Demands Otherwise

By Dever C. Ashmead
Kingston, Pa.

FEW people, possibly, realize how dangerous it is to connect the telephones of the various shaft stations and that of the hoisting engineer directly to the mine circuit, as is the present custom. With this arrangement it is quite possible that orders will be misunderstood and a serious accident result.

Let us suppose a case. Assume that the mine has two hoisting shafts and that the hoistmen have the same first name—John, for instance. Suppose, also, that at one of the shafts men are being admitted to the cage, and on the other timber is being loaded. The shaft tender, we will say, at the cage in No. 2 shaft, where mine posts and crossbars are being piled, desires that the cage be placed in a certain position. Accordingly, he hurries to the telephone to give the engineer the necessary instructions.

Ringing the 'phone, he says: "Hello, John!—say, lower that cage about ten feet, will you?" By mistake the hoisting engineer at the other shaft receives the message and, as he has the same first name, he lowers his cage in accordance with the shaftman's request. This occurs just as men are stepping upon the cage. A serious accident may easily occur.

One Way to Avoid Mixing Messages

If, however, the top and bottom cagers of one shaft could not possibly talk to the hoisting engineer at the other and could talk to their own engineer only by first throwing a cutout switch and if the engineer of either shaft could get onto the main telephone line only by means of a special cutout switch, the danger of the footman, or shaft tender, calling the wrong engineer by mistake would be obviated. With an arrangement of this kind there would be no possibility of the wrong engineer getting the signal, and no accident such as that just delineated could occur.

Realizing the danger of present conditions, C. W. Watkins, a hoisting engineer of the Glen Alden Coal Co., has designed a simple switch that always keeps the hoist drivers' telephone connected directly to that of the footman and the shaft tender. No one else about the mine can get onto this line without his intentionally allowing them to do so. This device obviates all possibility of confusion and misunderstanding of directions given over the telephone or of such instructions being received by some person for whom they were not intended. Furthermore, with an arrangement of this kind the line is always kept clear for the hoisting engineer and the footman to talk without having other people "butt in." Such interventions make it difficult for the two people to misunderstand each other.

In the accompanying illustrations Fig. 2 is a diagram of the connections. This layout, however, goes further than has been described above, as the office of the superintendent is connected with the mine foreman's office in such a manner that the two may talk without anyone else being able to "butt in" or listen in on the line.

As the shaft stations are completely disconnected from the main line and form an independent circuit of their own, they are naturally disconnected from the superintendent's office and that of the mine foreman. Consequently some arrangement should be provided whereby both of these officials may connect with this line. This gives the further advantage that these officials may be connected with the private line down the shaft, so that in case of accident or trouble the superintendent and mine foreman can have a private line leading to the main points of entry to the mine.

The switches in the superintendent's and mine foreman's offices are so arranged that when the 'phones here installed are connected to the mine telephone line they are disconnected from the shaft line. When it is desired to get a connection to the shaft line, it is only necessary to push down the connecting lever at the 'phone. This immediately disconnects the instrument from the main line while connecting it to the shaft line. Furthermore, these officials can get connected to only one of the shaft lines at a time, so that there will be no danger of having the two shafts on the same line simultaneously. As a result, there can be no confusion of signals to the engineers, with the usual hazard incident thereto.

It is obvious that neither the foreman nor the superintendent nor anyone in their offices would undertake

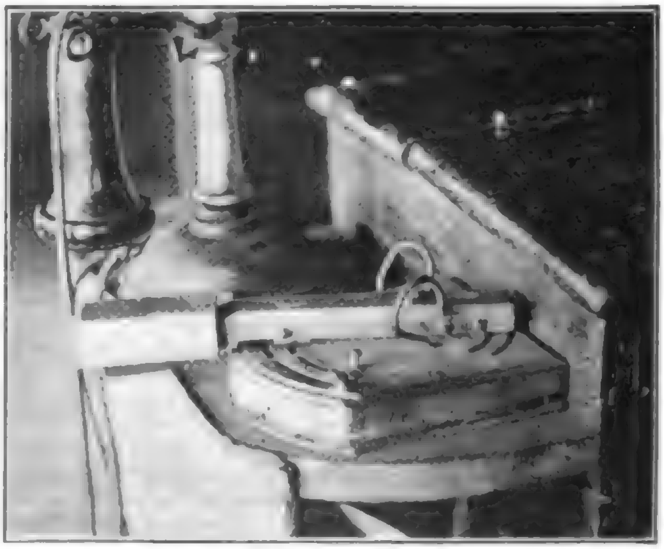

FIG. 1. SWITCH USED AT ONE OF THE PETTEBONE SHAFTS

Switch is so set that it is always connected to the shaft head and shaft stations. Should the engineer or someone else desire to talk on one of the mine lines the engineer must press down the lever to make the proper connections.

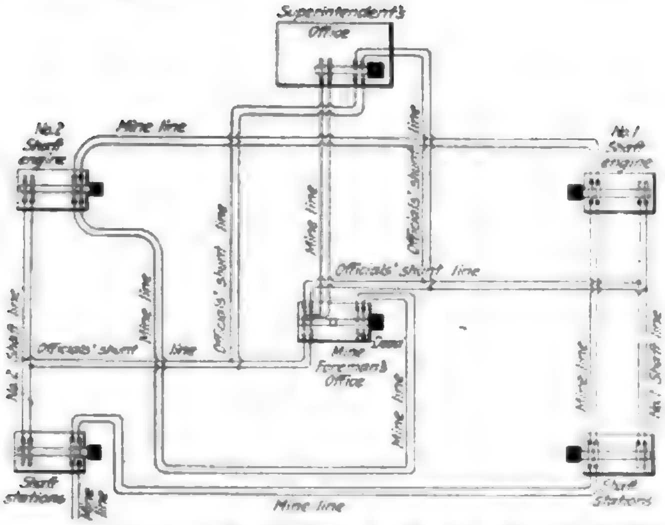

FIG. 2. SUGGESTED WIRING PLAN FOR PLANT WITH TWO HOISTING SHAFTS.

A direct line connects each engineer with the footmen and topmen of his shaft, but not with those of the other shaft. The mine line is connected only on the pressing of a lever by the engineer. By pressing levers the superintendent and mine foreman can talk to either of the shaft stations and to the hoist driver, but they cannot be connected to the mine line and shaft line at one and the same time. They cannot, moreover, connect themselves with both shafts simultaneously and consequently messages cannot go astray.

to direct the movement of the cage from any point save the landing. Consequently their ability to connect themselves with the shaft line is not fraught with any appreciable danger. But the Glen Alden Coal Co. management, while disposed to believe that the wiring plan shown is an improvement on current practice, feels that it would be still safer if each shaft line were wholly independent of all other lines whatsoever, though it would not object to a provision by which the engineer could connect himself with the mine line when he so desired.

In placing telephone wires in a mine great care should be taken to see that these conductors are kept as far apart as is conveniently possible; also that they are well insulated so that there may be no danger of their getting crossed. A good example of the danger resulting from crossed wires occurred at a certain anthracite colliery a few months ago. One Sunday the hoisting engineer was sitting in the doorway of his engine house when he received a signal to lower the cage. This, of course, he immediately obeyed. Hardly had the cage been lowered, however, when a man from the head of the shaft rushed over and demanded why the cage had been lowered when no signal had been given. Fortunately, two men had been talking with the engineer when the signal was received. They also heard it. Luckily no accident had occurred. It was discovered later that the difficulty arose from crossed wires.

Much responsibility always rests upon the hoisting engineer, as the life of every underground employee is in his hands usually at least twice each day. As a result, every possible precaution should be taken that errors in signals may be avoided, regardless of whether such errors result from misunderstandings of the signal code or from the receipt of instructions intended for some other person.

IN THE STATE OF TENNESSEE, through a co-operative agreement with the State Geological Survey, the sampling of coal mines has begun by an engineer of the Bureau of Mines.

Clean Vancouver Island Coals By Flotation Process*

Ten Pounds of Oil Usually Enough to Float a Ton—Only Gasoline Fails to Give Froth—Oil Chosen to Suit Coal

By P. E. PETERSON

THE writer has carried on some experimental work to test the suitability of the flotation process for the cleaning of Vancouver Island coals. For the most part, samples and washery products obtained from the Douglas seam were used in these tests. For the laboratory experiments a Janney flotation test machine was used. Larger tests were made with a Peterson cell 8 ft. 6 in. in diameter, having an approximate capacity of fifty tons per twenty-four hours. The results of the work show that on the material tested good recoveries of clean coal can be made by flotation.

The flotation process makes its separation by relying on the specific gravity of the substance to be floated, although in floating coal advantage is taken of the difference in specific gravity of coal and its impurities. The process depends rather on the formation in a watery pulp of an oily froth that has an affinity for the coal or carbonaceous substances. A flotation machine is an apparatus that by violent agitation or aëration produces a suitable froth from a proper mixture of oil, water and pulp, and by an arrangement of mechanical skimmers or launders removes the froth from the surface of the watery pulp and thus effects a separation of the mineral.

Almost any oil will give good results in flotation. Of all the oils tried, only gasoline failed to give a froth. In general the wood oils, such as wood creosote, pine oils, tars and turpentine, give good voluminous froths, and mineral oils, such as crude petroleum, coal tar, coal-tar creosote and kerosene, produce heavily loaded compact froths. Organic oils, such as castor oil, yield froths similar to those obtained with the mineral oils.

CHOICE OF OIL DEPENDENT ON COST

Which oil shall be selected greatly depends on its cost, on the size of the coal particles to be floated and on the type of flotation machine used. Some machines, as, for example, those of the mechanically agitated skimmer type, are perhaps best suited for operation with a heavily loaded compact froth. Machines of the subaërated type, such as the Callow cell, operate best when the froth is voluminous.

Froths of any character required can be obtained by the mixing of wood and mineral oils in various proportions. The selection of an oil mixture depends greatly on the nature of the coal to be treated. This is especially true of Vancouver Island coals, in which, apparently, the ash is inherently different in the several coal fields. The separation of low-ash products requires the application of selective flotation methods, such as a limited amount of oil and repeated recleaning of concentrates. The best results were obtained when using an oil mixture that produced a voluminous froth.

The amount of oil needed varies somewhat with the dilution of the pulp. A dilute pulp containing 95 per cent of water will require about one-third more oil to float a given quantity of coal than a pulp containing

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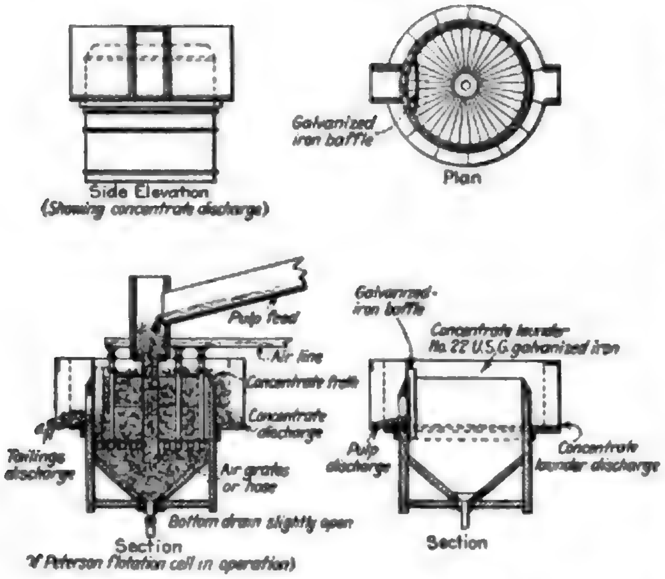
*Article entitled "Notes on Coal Flotation," prepared for presentation at the annual general meeting of the British Columbia Division, Canadian Mining Institute, February, 1922.



PETERSON FLOTATION CELL

The coal pulp is dropped into the bottom of the cell and air is added. A heavy oily froth, black with coal particles, is formed, which passes over a weir. With flotation the stiff froth lifts the coal above the slate so readily that the coal and tailings discharges can be made at levels further apart than with jig washing. Not only is coal lighter than slate but it is more readily carried by the froth and would still be so carried were it even heavier than the slate.

75 per cent of water. The actual weight used also varies with the kind of oil, but in general 10 lb. of oil is all that will be required to float a ton of coal, and in some cases 2 lb. of oil per ton of coal floated will be enough.

All sizes of coal and carbonaceous material passing through a ten-mesh screen are effectively lifted by the froths. In copper flotation, sizes coarser than 40-mesh will not very readily be lifted by the froths. This large difference in the size of the coal particles and the metalliferous minerals that will float is explained by their difference in specific gravity, that of coal being 1.4 as against about 4.3 for chalcopyrite.

Degree of Grinding Depends on Coal's Quality

The fineness to which the material must bt ground for flotation depends entirely on the nature of the coal to be treated. Material low in coal, such as washery refuse, requires fine grinding for the greatest recoveries. To insure a good recovery of clean coal from waste products containing 50 per cent ash or over it is necessary to grind the material sufficiently fine to pass through a 100-mesh screen.

Cleaner coals are recovered when working with dilute pulps. The ordinary dilution of 75 per cent water gives a dirty coal, but if from 90 to 98 per cent water is used clean coals are readily obtained. This is no doubt due to the clay, which forms a large proportion of the rock in coal. When ground with water it makes a colloid that is very slow in settling, and is thus carried in the float along with water in the froth.

Either fresh or salt water may be used without affecting the result. Economy in the use of oils is obtained by adding them to the pulp in a mixing cell before they go to the frothing cells. In fact, it is difficult to obtain uniform results in pneumatic cells unless the oils have been thoroughly mixed with the pulp prior to flotation. In all tests cold water was used, its temperature running from 7 deg. C. to 10 deg. C.

The above tests show the variation in recovery with the varying ash content of the cleaned coal. In making a coal having 13.16 per cent ash, 11.90 per cent of the jig rock is recovered, whereas when making a coal having 26 per cent ash there is a recovery of 29.2 per cent.

TABLE I. FLOTATION TEST ON JIG ROCK.

Product	Recovery Per Cent Total Weight	Per Cent Ash
Heads	100.00	50.00
Concentrate No. 1	44.60	29.00
Concentrate No. 2	29.20	26.00
Concentrate No. 3	23.20	22.40
Concentrate No. 4	19.20	19.88
Concentrate No. 5	14.15	14.34
Concentrate No. 6	11.90	13.16

TABLE II. FLOTATION TEST ON MINE SCREENINGS.

Product	Recovery Per Cent Total Weight	Per Cent Ash
Heads	100.00	24.15
Concentrate No. 1	96.60	22.50
Concentrate No. 2	90.50	20.80
Concentrate No. 3	87.10	19.40
Concentrate No. 4	86.40	19.07
Concentrate No. 5	83.00	18.20
Concentrate No. 6	78.50	17.00
Concentrate No. 7	74.80	16.00
Concentrate No. 8	72.10	15.10
Concentrate No. 9	69.40	14.70
Concentrate No. 10	66.20	14.20
Concentrate No. 11	54.70	11.80

Thus, if a coal of 17-per cent ash content is desired, Table II shows that 78.5-per cent recovery can be obtained. Table III is a summary of the results obtained when treating materials of varying ash content.

TABLE III. PER CENT WEIGHT OF COAL RECOVERED IN CONCENTRATE.

Material Tested	Per Cent Ash	Per Cent Total Weight 11% Ash	Per Cent Total Weight 12% Ash	Per Cent Total Weight 13% Ash	Per Cent Total Weight 14% Ash	Per Cent Total Weight 15% Ash	Per Cent Total Weight 16% Ash
Jig rock	50.00	10.4	12.0	13.0	14.1	15.0	16.5
Jig rock	40.00	22.5	24.5	27.0	29.5	32.0	34.5
Bone coal	32.90	37.0	40.0	43.1	47.1	51.1	55.0
Fines in sludge-tank overflow	29.35	43.0	47.0	51.0	55.0	60.2	65.1
Mine screenings	24.20	49.5	54.5	60.2	65.0	71.1	75.0

The principal features of this cell are its simplicity, low cost and ease of installation. It requires practically no attention. The water level can be varied at will and will remain at any set point until changed. The spigot discharge from the bottom of the cell effectively prevents banking. Per unit of cross-sectional area the capacity is as great as in any other cell.

Flotation is best suited to the recovery of coal from fine material. The cost of cleaning coal by the flotation process is greater than that of washing it in jigs or on tables; and naturally the latter method when applicable will continue to be employed in preference to the use of flotation. Coal-washing tables are an effective means of cleaning coal coarser than 60-mesh, and it is only with sizes finer than this that flotations will be useful.

Flotation Useful in Recovery of Fine Coal

The flotation process will not revolutionize the present practice of coal washing, but it will serve as a useful adjunct in recovering the very fine coal from slimes that are produced in the present practice. In the saving of coal from washery waste where it is necessary to grind the material, flotation in conjunction with coal tables will be the principal means of effecting the recovery.

On account of the extreme fineness of flotation coal, it is necessary to dewater it by means of Dorr thickeners and filters. The dewatered product from the filters is then mixed with other sizes and sold to the users of pulverized coal.

Using Proper Inspection and Repair Forms, No Detail Is Likely to Be Overlooked

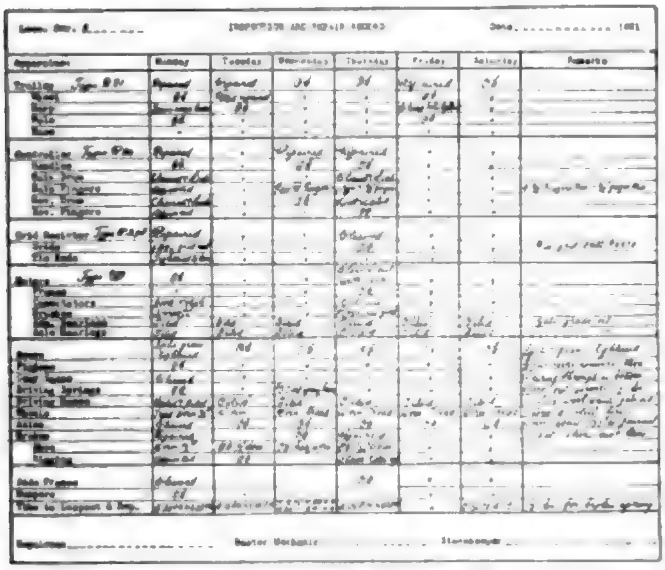
By H. H. Johnston*
East Pittsburgh, Pa.

THE forms employed for reporting the inspection of machines, particularly mine locomotives, are almost as numerous as the operations at which they are used. As a rule such forms are made up to suit the individual mine operator's ideas and no two are exactly identical. Some employ a blank on which the inspector or repairman merely makes check marks or fills in dates in the proper spaces to show when various pieces of apparatus were inspected or repaired. Others require not only this but also that specific written statements be made concerning the nature of the inspections, repairs and renewals performed.

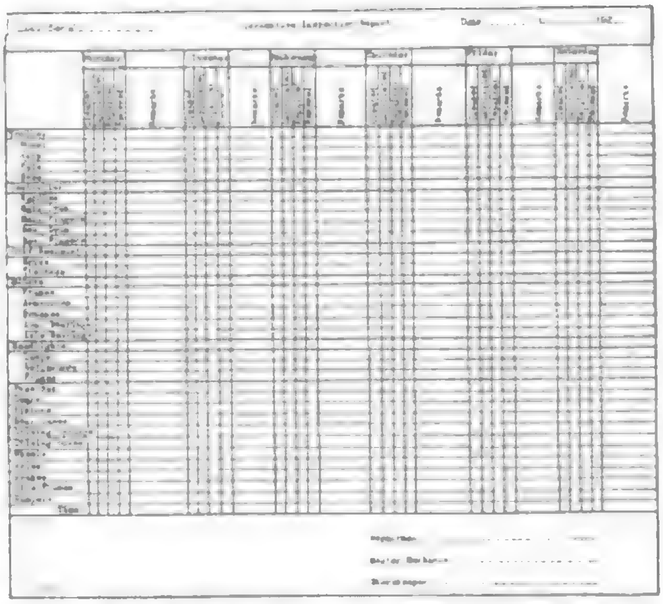
Two forms employed for recording the inspections of mine locomotives are presented herewith. These represent types that I have observed in most frequent use. The first of these tabulates in some detail the various elements composing a mine locomotive and the equipment mounted thereon. Inspections are given the machine at regular intervals. At such times not only the lubrication of the various parts is attended to but the condition of all other details must be examined and necessary repairs made thereto. In the report form mentioned it will be observed that on Mondays and Thursdays these notes are more full and complete than on other days, which indicates that more rigid inspections were made on those days.

Repairman Required to Do Little Writing

Another form employed in making inspection reports requires merely a check mark in the proper place under each heading, differentiation being made in the cleaning, lubrication, repair and renewal of the various parts. This blank requires but little writing on the part of the repairman. In preparing such a form it is well to leave space for remarks. It is of marked advantage to the store-keeper to have these reports properly kept, for if this is done he can estimate accurately in advance, from time to time, what material will be needed and what and how many parts should be carried in stock for making repairs to equipment.



RECORD OF INSPECTION AND REPAIR OF LOCOMOTIVE
This type of record requires more clerical ability than that which follows, but when properly kept gives information of great value.



INSPECTION REPORT INVOLVING LITTLE WRITING
A man with dirty hands and much to do and a short time to do it in is likely to prefer the opportunity here given to use checkmarks instead of words. With these he can say more than in the previous table, though less space will be used.

Though it is far preferable to have such forms as these printed and each pad provided with the necessary carbons for making the desired number of copies, blanks may be made up for temporary use by blueprinting. In fact if the number of machines to be inspected is small, blueprinted forms may sometimes be used to advantage as a regular practice. As each form shown above covers a week's inspection and repair to a locomotive, preparation of such blanks would hardly overtax the average mine blueprinting apparatus.

IF——

(From the Miner's Safety and Health Almanac, issued by U. S. Bureau of Mines, Washington, D. C.)

IF he had worn goggles and protected his eyes, he would not be blind.

If he had obeyed the safety-first rules posted up all over the mine, he would not have lost his hand.

If he had not lighted the match in gas, the mine explosion would not have occurred.

If he had only left alcohol alone, he would not have disgraced himself and ruined his health.

If he had not tried horseplay on the cage, he would not have been hurt.

If he had tested his roof, he would not have been killed by the fall of rock.

If he had watched his step, he would not have fallen down the ladder.

If he had used common sense, he would not have opened a can of powder with a pick.

If he had not lost his temper, he would not have lost his job.

If he had only been careful, neither he nor his fellow workers would have been injured.

If he had known first-aid work, he could have saved an injured comrade's life.

If he had consulted a doctor in time, his health might have been saved.

Of course, some risks are necessary, but how much loss and remorse a habit of caution and a pair of wide-open eyes would save miners?—Adapted from "If——," by Dr. Frank Crane.

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*Westinghouse Electric & Manufacturing Co.

Growing Need for the Preservation of Mine Timbers*

Coal Mines Use Underground Two and Half Billion Board Feet of Timber Annually — Timber Cost Per Foot in Anthracite Region Is Four Times That in 1905 — Use Timber Three to Four times as Fast as It Grows

By R. R. Horner†

IN 1905 the U. S. Forest Service,[1] in co-operation with the U. S. Geological Survey, collected from a large number of coal and metal mines in the United States statistics on timber consumption, which was the first systematic attempt in that direction. Though these statistics were by no means complete, so many representative mines were covered that on the data obtained a fairly accurate estimate of the total timber used by the mining industry could be made.

Following is a summary of the quantity of timber, both round and sawed, used in the production of various kinds of minerals in 1905:

	Cu.Ft.
Bituminous coal	103,042,200
Anthracite coal	62,110,166
Precious metal ores	29,028,833
Iron ores	14,644,750
Miscellaneous ores	3,038,616
Total Cu.Ft.	201,864,565

Of the total timber consumption 82.2 per cent was round timber and 17.8 per cent sawed timber. The percentage of the various kinds of timber was: Soft wood, 30.3 per cent; hardwood, 47.7 per cent, and not specified, 21.9 per cent.

Since 1905 no systematic attempt has been made to collect mine-timber statistics; however, a number of unofficial estimates, based upon the above-mentioned data, have appeared from time to time in the technical press showing the mine-timber consumption in the coal and metal mines. Perhaps the most reliable of these estimates and the one most nearly approaching the truth was made by F. K. R. Moll in 1915 in an article entitled "Preservation of Timber in Mining."[2]

Moll bases his estimate upon the production of coal, iron and other minerals for that year and the average amount of timber used per ton in their production. His figures show a timber consumption of 260,000,000 cu.ft., which is 28.8 per cent more than the consumption in 1905.

In the absence of any authentic mine-timber statistics and in order to show relatively the quantity now being used annually by the mining industry, an estimate will be made based upon the mineral production for 1919 and the average quantity of timber used per ton of coal and ore mined. The figures representing the quantity of timber used per ton of the various minerals mined have been obtained from various sources and are thought to be fairly representative.

However, it should be remembered that timber consumption varies greatly, depending upon the kind of mineral being mined, the nature of the deposits, the methods of mining, etc., and may vary widely even in mines in the same locality producing the same kind of minerals.

The mineral production for 1919 is given in round figures in the preliminary reports of the U. S. Geological Survey as 458,000,000[3] tons of bituminous coal, 88,000,000 tons of anthracite, 68,300,000 tons iron ore, and is estimated at approximately 65,500,000 tons for other ores. Of the 68,300,000 tons of iron ore, approximately 35,000,000 tons, or 51.4 per cent, was mined from underground workings requiring timber and the remainder from open pits in which little or no timber is used.

The average quantities of timber used per ton of mineral mined, taken from the most reliable sources available, are 0.33 cu.ft. per ton for bituminous coal, 0.70 cu.ft. for anthracite, 0.90 cu.ft. for iron ore (underground mining), 0.75 cu.ft. for other ores—gold, copper, lead, zinc, etc.

Based upon the above-mentioned figures of production and timber used per ton, the consumption of mine timber in 1919 is as follows:

	Tons (2,000 Lb.)		Cu.Ft. Timber per Ton		Total Cu.Ft.
Bituminous coal	458,000,000	x	0.33	=	151,140,000
Anthracite coal	88,000,000	x	0.70	=	61,600,000
Iron ore (shaft)	35,000,000	x	0.90	=	31,500,000
Other ores (est.)	65,500,000	x	0.75	=	49,125,000
Total					293,365,000 cu.ft.

This shows an increased timber consumption over 1905 of about 92,000,000 cu.ft., or nearly 46 per cent.

One of the serious problems that now confronts the mine operator in the important coal- and metal-mining regions in both the East and West is the noticeable decrease in the adequacy of the supply and in the quality of the timber of many mining regions, coupled with marked increase in cost.

In 1905, according to government statistics,[4] of the 43,676,000 cu.ft. of round timber used in the anthracite mines, the hardwoods rank first, with 14,238,000 cu.ft., or 32.6 per cent, of which more than 5,000,000 cu.ft. was oak, the remainder being mixed hardwood—chestnut, beech, maple, etc.

Of the 9,828,000 cu.ft., or 22.5 per cent, of soft wood reported, 8,349,000 cu.ft. was yellow pine, the remainder being hemlock and spruce in the order named. It should be stated, however, that the kind of round timber reported was not specified for nearly 20,000,000 cu.ft., or 45 per cent of the whole quantity used.

Much of the yellow pine was shipped from the South, but most of the other timbers used were obtained in Pennsylvania. During the same period the average cost of round timber was 6.6c. per cubic foot and sawed timber $15.17 per M board feet. Assuming the consumption of 0.7 cu.ft., the cost per ton of coal was 4.6c.

At the present time perhaps 75 per cent or more of the timber used in the anthracite region is soft wood—loblolly and second-growth yellow pine—most all of which is shipped from the South. No general cost of this timber is available, but figures obtained from one of the large operators show a cost approximately 27.5c. per cubic foot delivered, of which 42.7 per cent represents the cost of the timber and 57.3 per cent the cost of freight. The cost of timber per ton of coal mined is 19.2c. It may thus be seen that during the period of fifteen years from 1905 to 1920 the cost of round mine timber delivered in the anthracite region has increased from 6.6 to 27.5c., or more than four times.

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*Paper presented on Jan. 25 at the annual meeting of the American Wood-Preservers' Association, Chicago, Ill.

†Mining Engineer, Bureau of Mines.

[1] Forest Service Circular 49, U. S. Department of Agriculture.

[2] Mining and Scientific Press, vol. 110, p. 68, 1915.

[3] All figures are in short tons of 2,000 lb.

[4] Forest Service circular 49.

No recent figures indicating the quantity and cost of timber used in the bituminous coal regions of the East and Middle West are available, but it is reasonable to assume that the same relative increase will obtain as shown in the anthracite region.

From the foregoing discussion of the mine-timber consumption and cost in some of the principal mining districts in the United States it is plainly obvious that one of the rapidly increasing items of expense in mining operations is the cost of timber, to say nothing of the labor cost of installation. Therefore any practical means that may be employed to prolong the life of mine timber will greatly reduce mining costs and effect important economies in operation.

The rapid depletion of our forests and the far-reaching effect it may have on our industries as well as our national welfare have been repeatedly pointed out by those who have made an intimate study of the problem.

According to statistics published in the *American Forestry*[1] the consumption of timber for all purposes in the United States in 1919 was approximately 7,600,000,000 cu.ft., requiring in its production 23,600,000,000 cu.ft.

At the present rate of consumption it is estimated that three to four times as much timber is being consumed per annum in this country as is being produced by forest growth, and unless some measures are taken to arrest it the exhaustion of the better grades of structural timber may be expected in the not distant future.

DECAY AND INSECTS LEAD IN DESTRUCTION

Moreover, the cost is mounting from year to year, as a result of the rapid depletion of the better grades. Naturally, the use of the better woods is being curtailed wherever possible, and the inferior and less durable woods substituted, which have only cheapness and availability to recommend them. The consumer, therefore, is confronted by the serious problem of having effectively and cheaply to prolong the life of the inferior woods and thus conserve the timber supply.

Mine timbers are destroyed by four principal agents—decay, insects, fire and mechanical abrasion. Of these, decay and insect attack are by far the most important. The amount of mine timber destroyed by these different agencies varies greatly with the conditions in the mines, and depends largely upon the character of the deposit and method employed in mining it.

In general more than 50 per cent of the timber used in the mines is destroyed by decay and insect attack, but perhaps not to exceed 15 per cent of the total is subject to replacement, that is, where the working place will be kept open longer than the natural life of the timber.

Timber conservation may be accomplished in part by the better selection, preparation and storage of timber intended for mine consumption, but the most effective means is by treating the timber, to prevent decay, with some standard preservative before it is placed in the mine.

It is needless to point out that only those timbers should be treated that will be used in working places which are to be maintained for a period of years sufficiently in excess of the natural life of the timber to warrant the use of treated timber. Neither should treated timber be used in places where it would be subjected to destruction by crushing rather than by decay.

It is estimated that on an average possibly 85 per cent of all the timber employed annually in the mines in this country is used in working places of only temporary nature, such as rooms in coal mines and stopes in metal mines that will soon be worked out and abandoned. Much of this timber is destroyed by crushing or covered up by waste rock and is of no further service.

NEW OR MODIFIED MINING SYSTEM SUGGESTED

Even where subjected to decay its natural life usually is greater than its mechanical life, therefore preservative treatment would not be justified. The only practical means of reducing the quantity of timber used in this manner would be either to modify the existing system of mining or adopt an entirely different system, wherein less timber is required.

Of the enormous total of approximately 293,000,000 cu.ft. of timber consumed annually in the mines it may be safely estimated that an average of 15 per cent, or 43,950,000 cu.ft., is used in underground haulageways, airways and other openings of a more or less permanent character where the timber is largely destroyed by decay.

Experience has shown that the average life of mine timber in permanent openings, where it is not subject to crushing, is about three years, but often under conditions unusually favorable to decay the life will not exceed one year. Assuming that the average mine shaft, tunnel drift and gangway will be in service for a period of twelve years, it may be seen that the timber supports will be renewed at least three times, and under some conditions five to ten times.

INCENTIVE TO THE USE OF PRESERVATIVES

If the minimum figure is taken the quantity of timber consumed during the 12-year period is 175,800,000 cu.ft., of which 131,850,000 cu.ft. might have been saved had the original timbers been given a preservative treatment. If the average cost of the timber be taken at 25c. per cubic foot the saving in timber alone would be $32,962,500. The labor cost in replacing would be equal to and in many instances much more than the cost of the timber. It is obvious, therefore, that by treating timber to prolong its life the annual saving in cost of labor and timber will be large.

In the foregoing estimate of the annual consumption and value of mine timber no account was taken of the relatively large quantity of timber used in surface construction. Unfortunately, no data are available upon which to base even an approximate estimate of the quantity of timber thus used. Obviously, however, the quantity is large, as may be appreciated by citing some of its many uses.

The principal surface structures built wholly or in part of wood are headframes, shaft houses, breakers, tipples, tramways, ore bins, coal bunkers, trestles, flumes, concentrating mills, stamp mills and mine buildings—comprising timber-framing and carpenter shops, blacksmith shops, machine shops, power houses, change houses, supply houses, etc.

In addition, an important amount of lumber and dimension timber is used in miscellaneous mine and mill equipment such as mine cars and trucks, tanks, launders, conduits, concentrating tables, jigs, flotation machines, classifiers, battery blocks, foundation timbers, etc.

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[1] *American Forestry*, March, 1920, p. 143.

These structures and equipment require constant repairs and replacements, of which perhaps 80 per cent or more is caused by decay and could be largely avoided if the original timber were given a preservative treatment.

The average life of untreated wooden surface structures is placed at ten to twelve years; however, the average life of timber entering into mine and mill equipment subjected to replacement from decay probably is not over six to eight years. Assuming the average period of usefulness of all kinds of mine construction is twenty years, then the timber subjected to decay will require replacement at least once during its period of service in the case of surface structures, and twice in case of mine and mill equipment.

With proper preservative treatment of the original timber entering into this construction it could be made to last throughout the entire period of service, thus effecting an important saving in the cost of material and labor.

To determine the advisability and economy of treating underground timber, also timber used in surface structures and equipment Barth[4] formulated the rule which is substantially as follows: Timber that is permanent in character—that is, which is not exposed to destruction by mechanical wear or crushing before the expiration of its natural life or the usefulness of which does not cease before the advantages of chemical preservation can be realized—should be treated.

Timber Treatment Much Used in Germany

In Europe, particularly Germany, treated timber has been extensively used in the mines for many years, and in 1915, according to Moll,[5] no less than 100 large and small timber treating plants for mines had been erected. In 1904 there were in the mining district of Dortmund, Germany, sixteen mines which treated timber and twenty-five others that had tried out preservatives.

About 1903 a commercial timber-treating company had entered the mining field and up to 1915 had erected over thirty plants in Silesia alone. However, in this country the mining industry has been slow to adopt the use of treated timber, notwithstanding that the replacement of timber caused by decay often constitutes one of the principal items of mining expense.

The explanation of this is that mining timber in most localities, until the last few years, has been plentiful and comparatively cheap. As a result no inducement was offered to practice economy in its use. Furthermore, mine operators in general have not been well informed concerning preservatives, treatment methods and costs, and the benefits to be derived from the use of treated timber, but as they come more and more to realize these benefits, its use, no doubt, will be rapidly extended.

In 1906 the Forest Service in co-operation with the Philadelphia & Reading Coal & Iron Co., undertook a series of experiments to test the practical value of treated mine timber, the efficiency of various preservatives, and the cheapest and most effective method of application for the purpose intended. Later this service was extended to include other coal-mining companies in the East and a few metal-mining companies in the West.

Although these experiments proved conclusively the practical value and economy resulting from the use of treated timber, yet the co-operating companies have not increased its use to the extent that was anticipated, and the quantity used by them at present as compared to their total requirements is insignificant. Neither has timber preservation been generally adopted by the mining industry to the extent that the results of the experimentation had given reason to hope.

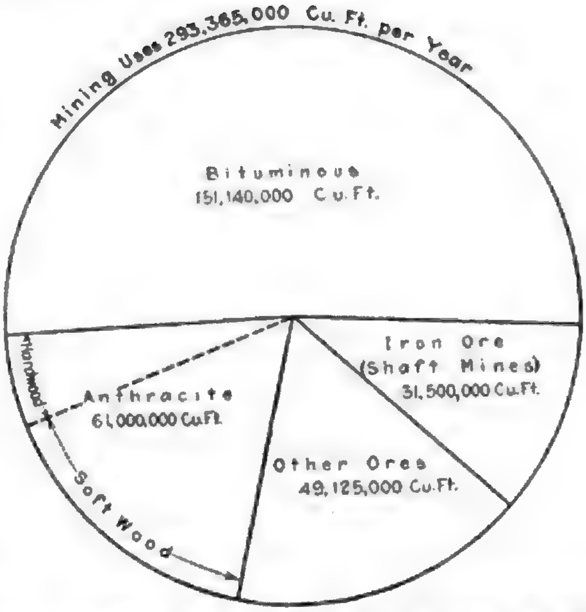

CHART SHOWING RELATIVE USE OF TIMBER IN MINES

About 72 per cent of all the timber used in mining is taken by coal mines, the bituminous regions using two-thirds of that percentage and the anthracite region the other third.

The reason for the lack of interest in timber preservation at that time was that the timber situation throughout most of the mining regions of the country was not sufficiently acute to cause the operators to consider seriously the benefits to be derived from its adoption. In brief the introduction of timber preservation into the mining industry was premature, consequently it languished for lack of support.

Mounting Costs Enhance Importance of Economy

However, in recent times, with mounting cost of production and the low price and lack of markets for the materials produced, the situation has entirely changed and mine operators are now ready to give serious consideration to any practical suggestion by which economies in operation may be effected.

The Bureau of Mines has only recently undertaken a systematic investigation of the decay of mine timbers and its causes and prevention. The bureau's observations to date have led to the conclusion not only that important savings in the cost of operation may be realized by the use of treated timber but also that preventing mine timber decay will remove one of the principal sources of heat and vitiation of mine air, which in turn has an important bearing on the problem of mine ventilation.

The mine operator is interested in timber preservation because the preservative treatment of mine timber to prolong its life will reduce operating costs, conserve the timber supply and make possible the utilization of inferior and less durable woods, which are practically useless unless treated to prevent rapid decay. In addition the use of treated timber to arrest decay promotes safety, health and efficiency of the men employed in the mines.

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[4] Kurt C. Barth, *Engineering and Mining Journal*, vol. 104, 1917, p. 985.

[5] F. K. R. Moll, *Mining and Scientific Press*, vol. 110, 1915, p. 69.

Problems of Operating Men

Edited by
James T. Beard

Miners Now and Forty Years Ago

Former Apprenticeship of Miners — Change in Conditions and Equipment Work Radical Changes in Qualifications of Miners—Pick Mining Gives Place to Machine Mining—Miner, Today, a Coal Loader

IN his letter, entitled "Miner in Twenty-Seven Days," *Coal Age*, Sept. 29, p. 495, "Mac." says: "In Canada, a man is not permitted to have charge of a place or work as a miner, until he has been employed as a mine laborer underground for at least a year."

Reading that statement made me think of old times back in the early eighties, when I went to the mines to make a miner of myself. It took twenty months to bring about the transformation. In the mine where I began to work, most of the men had to work as laborers for at least two years, before they were given places to work themselves.

THE MINER AS AN APPRENTICE

I was placed in charge of a good miner and performed all kinds of work pertaining to the mining of coal. At the end of twenty months, I succeeded in getting a place of my own. When the boss told me, one night, to get some tools, that he had a place for me, I felt like shaking hands with myself over the good news.

When taking his first place as a miner, there is a wide difference in the qualifications of a man who has worked several months with an experienced miner, and one who starts with an experience of only twenty-seven days underground.

When I first began to dig coal by myself I knew reasonably well how to use the pick, set a boring machine, stand timbers and arrange and charge shots. It was some time, however, before I learned to have full confidence in my own judgment in doing these things. For many months I felt the need of the old miner's oversight and approval.

MINING COAL FORTY YEARS AGO

That was forty years ago and we are living, today, so to speak, in a faster age. In those days speed in mining coal did not count for as much as it does now. Even the farmer hitched his horse to a vehicle and considered himself going some, if he drove forty miles in a day. With his high-powered car and improved roads, today, he covers that distance in less than an hour. Soon the speed of the automobile will be too slow and it will be exchanged for an airplane that can make a hundred miles an hour.

Neither the methods of making miners, nor the ways of mining coal and equipping the mines, practiced forty years ago, fit in with modern mining, today, and it would be useless to make the attempt to compare them. Coal mining, like every other enterprise, to be successful, must employ up-to-date scientific and improved methods of operation.

We need, today, modern trained men and officials who have kept apace with all the improved mining appliances, and have the ability to handle successfully the new type of miners. Those of us who are inclined to hold to the ways and methods of coal mining as we first learned them must recognize and accept these changes.

The present miner is not required to serve an apprenticeship of one or two years, as we did, in order to become efficient. He is not a pick miner but, instead, is skilled in the handling of mining machinery that the old miner knew nothing of. Mining machines, locomotives, and drilling and loading machines are being operated, today, by young men trained in their use.

TODAY, THE PICK IS LAID ASIDE AND MINERS ARE COAL LOADERS

The present-day miner, in many instances, is nothing more than a coal loader. The coal is cut with a machine and broken down by shotfirers, while the timbering is done by timbermen. Nothing is left for the miner to do but to load the coal. The pick is not used to the same extent as formerly. Where the coal is not mined by machines it is shot from the solid without being mined with the pick.

Going back to the efficiency of the miner, there are two classes of men coming from the farm, the shop and other places to work in the mines. One of these classes is slow to learn and the men never acquire a working knowledge of mining, while those of the other class learn more quickly and make good miners.

The efficiency of a miner cannot always be gaged by the length of time he has worked underground. After all, it is the qualifications of a miner that count and some acquire these in a much shorter time than others.

Speaking in reference to miners keeping their working places tidy, some people are built that way naturally, while others are the reverse. Some miners take more care and pride in keeping up their places than others, and such places are safer and more convenient for work. There is a class of miners who never wash their faces clean, though they consume as much time in the operation as others who always appear clean and tidy.

CHARACTER OF A MINER SHOWN BY HIS WORKING PLACE

During years of service as fireboss, in making my morning rounds, I have found miner's places with most of the timbers shot out, and the coal scattered back along the roadway and in the gob. The place would look like it had been struck by a cyclone. Go back to such a place at 10 o'clock, and you would find the miner moving slate and trying to get his coal out of the gob.

In other places where the natural conditions were the same, the timbers would all be standing and the shots would have just heaved out their burdens a few feet from the face. Of these two places that I have mentioned, the former was not always the young miner's place; it was as frequently the older miner's place. Tidiness belongs no more to the older miner than to a younger one.

In his letter, *Coal Age*, Nov. 10, p. 768, George Edwards makes this statement, "Years of experience do not make safe mine workers. Men who have mined coal all their lives are frequently less capable of safeguarding themselves than the man new on the job." I concur in the first part of this statement, but not in the latter. Surely, experience, in any calling, will not make men less capable of taking care of themselves than those without.

THE WISE AND SAFE WORKER

Experience ought to make men capable; but neglect and carelessness will make them unsafe workers. The miner, old or new, who can ascertain unsafe conditions as they occur and who proceeds at once to make himself safe is the wise and safe worker. The old miner knows but may not heed, while the new miner would heed if he knew.

As our friend "Mac." says, if these new miners chance to get a place where the top is good and the coal will almost work itself they make things move. At such times, it is certainly amusing to listen to their talk, at the gathering places, after workhours, when they tell of the number of cars they have loaded during the day; or if the cars run short hear them complain.

Such miners will often labor harder at these places than in the mines. Let a stranger be present who is not familiar with mine work, and will listen to anything told him about the mines, it is astonishing how much information these miners volunteer to give.

The Boss a "Fine Fellow"

As long as this class of miner holds a good place, the boss is most generally a "fine fellow." But, let the place go to the bad so as to require hard work and skill to drive it, and you will hear the man complain how the boss is not treating him right; and soon the fellow quits and is gone, while another miner with nerve and judgment takes the place and does well.

In conclusion, let me say, the old miner who has gone through underground scenes and experiences, and fought and won many great battles there, with his pick and shovel, saw and timber, realizes there are still other battles to be fought and won in the mine. The old student miner is not very sure, today, that he knows much about mining. He realizes that there is much to learn and the necessary knowledge can only be acquired through technical training and study.

Dayton, Tenn. **John Rose,**
Former District Mine Inspector.

Loose End and Solid Shooting

Opposition to installing coal cutters hard to overcome—Law requiring employment of shotfirers wrought a change—Average miner not to be trusted in solid shooting.

At the time the Pennsylvania Law was written there was considerable feeling against shooting coal off the solid, as such practice was recognized as one of the most probable causes of mine disasters. However the law makers were face to face with a most difficult problem in attempting to pass a law that would compel the largest coal-producing districts in the state to install mechanical coal-cutting equipment in their mines.

The practice of open-end shooting off the solid had proven highly satisfactory for the preparation of coal for coke making. Furthermore, it was considered doubtful, at this time, as to whether the installation of electrical machinery would increase the safety of mining operations in a district that was both gaseous and dusty.

Passage of the Shotfirers' Law

After much discussion a law was finally passed that has brought about the most modern methods of mining and recognized safe practice. Operators realized that if the blasting of coal was placed in charge of competent and reliable shotfirers who would follow recognized safe methods of shooting the greatest danger in blasting the coal would be overcome.

Solid-shooting districts were subjected to frequent rigid inspections. Operators were compelled to comply strictly with the requirements of the law relative to the employment of trained men for charging and blasting all holes drilled by the miners. The rules required using permissible explosives, clay for stemming, electric detonation, wooden tamping bars, etc.

After electric installations in the mines were made reasonably safe, practically every operation in the solid-shooting fields installed coal-cutting machinery. The result is that, today, in those districts, are to be found the most modern operations in the world. Since entering so largely on the campaign for mine safety, we frown on any practices that appear to encourage disaster and sooner or later, it would seem proper to insist on laws that permit the least possibility of human failure.

Shear or Sidecut Same in Effect as Loose End

I believe it is generally recognized that a shear or sidecut is the same as a loose end, in the blasting of coal. Also, we consider that a shot that has a chance to work is ordinarily safe. It follows that a miner who has a due regard for safety can maintain a free end in driving rooms or drawing pillars, without always making a shear.

But, while we understand these things, let us not forget that the average miner of today has not reached a condition where he can be considered reliable in things involving his own personal safety and that of others. For this reason alone, it would be a dangerous law that would permit the average miner to be his own judge as to what constituted a "free end," in blasting; or expect him to follow safe practices where the opportunity is so great to take chances.

Taking every thing into consideration, my opinion is that the inspector who will not permit the ordinary miner to shoot coal from the solid is within the law.

To insure the greatest safety in mining coal that is not undercut, topcut or centercut, only competent shotfirers should be permitted to charge and blast the holes, in all places.

Pikeville, Ky. **George Edwards.**

Shooting Coal Off the Solid

Conclusions often based on local conditions—Districts where solid shooting is unsafe—Cracker shooting—Windy and blownout shorts—Electric firing—Conditions that require solid shooting.

In THE consideration of solid shooting and other questions pertaining to the operation of coal mines, safety of life should have the first place, and protection of property and production a second place. As one writer puts it (*Coal Age*, Aug. 25, p. 302), "The life of one miner is of more value than all the coal mined."

In another letter, Nov. 17, p. 806. William Crooks expresses a truth when he says, "Most all men, in expressing their views on different subjects, are largely guided by their observance of local conditions and results." We see the danger, or at least we think we do, of certain acts performed under conditions familiar to us in other places. In other words, we are governed by the local conditions with which we are previously acquainted and which we have known to bring results. Again, I agree with the same writer when he says, "Where a proper regard is had for all rules, solid shooting is safe."

Solid Shooting Practiced Under Dangerous Conditions

With interest I note what Oscar H. Jones says in his letter, Nov. 3, p. 724, regarding solid shooting being permitted in a number of mines in his district. My own acquaintance with some of these mines leads me to say that I know of no other operations where solid shooting is practiced and the danger as great.

A few years ago cracker shooting was practiced in the same mines. Excessive charges of black powder were used and fine coal for tamping purposes. I had understood that the use of black powder had been abandoned in that district and a permissible explosive adopted, until I read Mr. Jones' letter. I agree with him in condemning the practice of using two grades of powder in the same charge, which should not be permitted in any mine.

Poor Judgment in Placing Shots Causes Many Disasters

In the same letter Mr. Jones very truthfully remarks, "Many mine disasters are caused by miners exercising poor judgment in placing shots and charging their holes." Let me add that the need of care and judgment, by miners, is not confined to mines where solid shooting is practiced, although in solid shooting a miner must use good judgment if he is to keep his place in proper shape.

Speaking of cracker shots takes me back, in memory, thirty years ago when miners driving narrow headings would cut out a "cracker" that had crushed the coal pretty well. Then, taking a long auger, they would bore two cracker shots, six or seven feet deep, in the face of the cut-out cracker, one shot near the bottom and the other toward the top. The shot it was desired to fire first was given the most powder. One or two sticks of dynamite were placed in the bottom of the charge.

There would be at least two heavy sideshots, which were planned to fire before the crackers. Think, for a moment, of the amount of explosives burnt in this narrow heading, in the space of about one minute, and the heat and gases produced. The miners fired twice a day, and the coal was rather dry and gave off some gas. Today, I would not stay in such a mine longer than it would take to get out.

Cracker shots should never be used in rooms, unless the coal is either mined or sheared. There is more excuse for the use of cracker shots in narrow headings where the coal is too hard to be sheared or mined, and black powder or mixed charges should never be permitted. Nothing but a permissible explosive should be used, tamping the shot with clay.

DANGER IN POOR ARRANGEMENT OF SHOTS MORE THAN IN HEAVY CHARGES

Heavy coal shots when well arranged, and properly charged, are less dangerous than smaller ones that are improperly arranged and excessively charged, although more powder may be burned in the former than in the latter. In my experience, "windies" are not always produced by heavy shots; neither do blownout shots always cause "windies."

Some of the hardest "windies" I have ever felt were caused by small shots. I recall one instance where pillars were being drawn in coal that was about five feet thick with a divide about eighteen inches from the top. This upper coal would sometimes adhere to the top and have to be shot down. A miner, on the third pillar from where I was working, bored a hole about three feet deep in this topcoal and charged it with three or four inches of powder. The shot pulled down the coal nicely, but came near blowing us all out of the mine.

I have also observed that some well arranged and properly charged shots would pull their burdens even and nicely, but at times make "windies." It seems to me that atmospheric conditions may have much to do with causing windy shots.

EMPLOYMENT OF SHOTFIRERS

Writing on this subject, Oct. 20, p. 646, R. W. Lightburn thinks all shots where solid shooting is practiced should be fired by an electric battery, in the hands of a competent person, and after all the men have left the mine. Where shots are prepared by miners and left for shotfirers, there is a tendency on the part of the careless miner to overcharge a hole and use more powder than he would when doing his own firing.

In the employment of shotfirers, it is true, there is greater protection of life, but not always of property. In large mines the firing of all the shots at one time by a battery might become troublesome, though in my opinion there would be few, if any, blownout or windy shots.

SEVERAL SHOTS IN ONE PLACE SHOULD ALL BE FIRED AT ONCE

Take, as an illustration, a room giving off a little gas and rather dry and suppose there are four shots to be fired. If one of these shots is a tamping blower, the danger would not be as great when all the shots are fired at once, as it would be if this shot was fired immediately after the other three.

When a blownout shot projects its flame into a room, filled with cool air holding but little dust in suspension, the flame is cooled before it can raise the temperature of the room to the point of distillation. On the other hand, if other shots fire first, in quick succession, the blownout shot projects its flame into a room filled with dust and gases and with a temperature already raised to a high point and an explosion is initiated.

But, getting back to the question of solid shooting, permit me to say that it makes but little difference how the term may be defined; the practice, in many mines, is here to stay. The size and nature of the coal, the irregular formation in many places, the expense of equipping for machine mining, the disuse of the pick, on the part of miners, for mining and shearing shots, as formerly, these together with the prospect of the mine not being more than a small and short-lived one, are sufficient in themselves to warrant the conclusion that solid shooting, in many places, will be continued, whatever may be said against it. That being the case, the only thing to be done in this respect is for local mine officials and inspectors to adopt and rigidly put in force, in such mines, rules and regulations concerning shooting that will insure the greatest safety.

KIND OF SOLID SHOOTING THAT IS SAFE AS SHOOTING A LOOSE END

What is generally defined as "solid shooting" if in charge of a practical miner is no more dangerous, in many respects, than shooting from the loose end of a pillar. The practical miner drives a room twenty or twenty-five feet wide in such shape as to have what miners call shoulders to shoot from. The shoulder gives a shot a good chance to work and, in a true sense, the practice cannot be called solid shooting any more than shooting from the loose end of a pillar without mining the shot.

One writer remarks, Oct. 20, p. 645, "Several years ago nobody ever thought of shooting coal off the solid or dared to make the attempt." In the mine where I first began to work no coal was shot from the solid. Every miner was required to keep a cutting near the center of his place. The boss came around often to see that each miner had this cutting and what kind it was. I worked in that mine five years, and a new boss came who gave no attention to the cuttings, so that when I left the mine, as the boys would say, the coal was being "pulled out by the hair of the head."

In his letter previously mentioned, William Crooks refers to eight explosions, costing five or more lives, during the past ten years, all having occurred in machine-cut mines, in Alabama. For the same period he states there had been none in mines practicing solid shooting. I do not know the proportion of solid-shooting mines to machine-cut mines in that state, but this statement ought to be convincing proof that solid shooting when properly supervised by state and mine officials, as in Alabama, is not as dangerous as many would make it appear. What is true of Alabama, in this respect, will apply to other states. To say that all coal shall be mined before shooting would be to close down many mines throughout the country.

Dayton, Tenn. JOHN ROSE.

Inquiries Of General Interest

Horsepower of Steam Boilers

Horsepower in Steam-Boiler Practice Based on Evaporative Power of Boiler—Power Developed Depends on Rate of Generating Steam Rather Than on Heating Surface of Boiler

KINDLY explain the method of computing the horsepower of a steam boiler. My experience in a boilershop has led me to understand that the horsepower of a boiler is calculated from the amount of its heating surface, including both the shell and the tubes, or the entire surface exposed to the heat of the flame and gases of the furnace. Lately, however, I have been studying the subject and find that this is not the method employed by engineers in estimating boiler horsepower. I am anxious to get a clear understanding on this matter.

La Salle, Ill. STUDENT.

It is common practice among boilermakers to rate the power of their boilers according to the extent of heating surface, as this correspondent has stated. For plain cylindrical boilers, an allowance of from six to ten square feet of heating surface, per horsepower, is customary. In flue boilers, the allowance is from 8 to 12 sq.ft. of heating surface, per horsepower. Again, in return-tubular boilers, the allowance is from 14 to 18 sq.ft. of heating surface, per horsepower.

A little thought makes it clearly evident that this method of computation is far from accurate. It is found that, for the same type of boiler and the same heating surface, the actual power developed varies considerably, in practice. Moreover, the length of time a boiler has been in use, the care that has been given to it and the method of firing, all affect its evaporative power.

The accumulation of scale on the inside of the boiler and the coating of rust and dirt in the tubes also reduce the capacity of a steam boiler to produce power.

For these reasons, engineering practice has adopted a standard method of computing the horsepower of boilers. This method is based on the capacity of a boiler for generating steam. The standard boiler horsepower adopted is the evaporation of 30 lb. of water, per hour, from a feed-water temperature of 100 deg. F., into steam at 70 lb. gage, at sea level. This is equivalent to the evaporation of 34.5 lb. of water, from and at 212 deg. F.

It is readily seen that this method of determining the horsepower of a boiler depends on an actual test in practice; and, as previously stated, the same type of boiler, having the same amount of heating surface, is often found to have a greater or less evaporative power and its horsepower should be rated accordingly.

For example, assuming a feed-water temperature of 100 deg. F., and generating steam at 70 lb. gage, at sea level, a 50-hp. boiler will consume 50 x 30 = 1,500 lb. or, say 180 gal. of water, per hour.

In this connection, it must be remembered that both the water consumption of a boiler and the steam generated, per unit of time, will depend much on the heat supplied by the furnace, as determined by the quality of the coal burned, the kind of draft and other factors that affect the efficiency.

Examination Questions Answered

Indiana Mine Firebosses' Examination Indianapolis, Oct. 1, 1921

(Selected Questions)

Question—*Describe in full a fuel safety lamp, giving the function of each component part.*

Answer—All safety lamps are fuel lamps. The term "fuel" has been occasionally applied to safety lamps to avoid a supposed confusion with electric lamps. The latter, however, are not safety lamps. A safety lamp is one in which the flame of the lamp is isolated from the outside atmosphere by a wire gauze. In the same manner, the expression "flame safety lamps" is sometimes used and for the same reason. But, all safety lamps are flame lamps. No form of electric lamp designed for use in mines can be properly termed a "safety lamp," which is a lamp burning some kind of fuel, either oil or gas, and whose flame is isolated from the outside air by means of wire gauze.

The safety lamp consists essentially of an oil vessel or a tube containing the gas used as fuel for the lamp. Surrounding the flame of the lamp is a gauze chimney, or a glass cylinder surmounted by a gauze and forming the chimney of the lamp. This chimney is fitted to the lamp to which it is firmly secured in a manner to exclude all air from the lamp, except what passes through the mesh of the gauze.

As stated, the purpose of the oil vessel, or gas container, is to supply the needed fuel to the lamp to maintain the flame within the combustion chamber. The purpose of the gauze is to permit the entrance of the air supporting the flame and, at the same time, prevent the flame from passing out and igniting any gas on the outside of the lamp. The purpose of the glass cylinder is to improve the illuminating power of the lamp. Asbestos washers are used to form a tight joint between the oil vessel and the chimney surmounting it.

Question—*What precautions would you take in assembling and using a safety lamp, to insure the greatest factor of efficiency and safety?*

Answer—Each separate part of the lamp should be carefully cleaned and examined. The wick should be well trimmed and, if gummed, should be replaced with a new wick. In putting the lamp together, care must be taken to see that the parts are closely fitted and no part omitted. It is particularly important to see that the gauze is perfect and clean.

Question—*Explain the danger that may result from each error in assembling a safety lamp.*

Answer—Any defect in the gauze of a lamp or failure to properly put the parts together or omitting a washer or other part may cause the failure of the lamp when exposed to gas and result in an explosion.

Question — *What elements compose atmospheric air and what is the percentage of each, by volume?*

Answer—The principal constituents of atmospheric air are oxygen and nitrogen. The percentage of each, by volume, is: oxygen, 20.9 per cent; nitrogen, 79.1 per cent. Besides these chief components, air contains 0.04 per cent of carbon dioxide and still smaller amounts of ammonia and water vapor. Small percentages of other constituents sometimes given are not important.

Question—*What elements may be added through the circulation of the air in the mine and what elements may be taken from the air in its passage through a mine? Explain fully.*

Answer—The air current passing through a mine may absorb large quantities of methane or marsh gas and carbon dioxide, where these gases are generated in the workings. The same current may either absorb or deposit water vapor in its passage through the mine, depending on the conditions in respect to the relative humidity and temperature of the mine air and outside atmosphere. The current may also absorb, in less quantity, carbon monoxide when this is present in the workings.

Question—*What are the causes of mine fires?*

Answer—The principal causes of mine fires are the careless use of open lights in proximity to combustible matter; spontaneous combustion of fine coal and slack in the gob; the ignition of gas feeders by the flame of a shot in blasting; improper installation of electric wires and machinery; the blowing out of a fuse or the sparking of wires igniting gas; the careless use of matches where men are permitted to smoke in the mine, etc.

Question — *Under what conditions would you seal off a section of a mine to extinguish a fire?*

Answer—For the purpose of extinguishing a fire in a section of a mine, recourse should be had to sealing off the section, only when every other possible means has been employed to put out the fire, and the latter has gained such headway as to menace adjoining portions of the mine.

Question—*(a) What are the purposes of sealing off fire areas in a mine? (b) How would you determine when those purposes are accomplished?*

Answer—(a) The object of sealing off a fire area in a mine is, primarily, the extinction of the fire by preventing the access of fresh air, which is necessary to maintain the combustion. Another purpose is to prevent the contamination of the mine air with the gases produced by the fire. A third purpose is to prevent the spread of the fire to adjoining workings.

(b) The progress of the fire or the effect of building the seal is carefully watched by testing the nature of the gases given off through the pipes built into the seals. The character of these gases and their temperature will eventually determine when the sealing off has accomplished its purpose.

Question—*A chemical analysis of mine air showed the following: Nitrogen, 80 parts; oxygen, 12 parts; marsh gas, 3 parts; stinkdamp, 1 part; blackdamp, 3 parts; whitedamp, 1 part. Is this an explosive mixture? Give reasons for your answer.*

Answer—This mixture is highly explosive, containing as it does 5 per cent of explosive gases, viz., methane, 3 per cent, hydrogen sulphide (stinkdamp), 1 per cent, carbon monoxide (whitedamp), 1 per cent.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THERE is comparatively little change to be noted in the last month in the industrial situation other than that incident to the general accounting which usually takes place at this season of the year, according to the *Guaranty Survey*, just issued. "The holiday trade is over," the *Survey* continues, "and business men have been occupied in making up balance sheets and reconsidering their positions in the light of these figures. Under such circumstances it is natural that orders should be light and collectors more pressing in their demands.

"On the other hand, the drastic changes which took place last year and which have left the business community in a much sounder position than it held at this time a year ago, give ground for more than mere hopefulness in the future outlook. Many of the weaker members have fallen by the wayside. The general level of wholesale commodity prices has remained almost unchanged for the last six months in spite of considerable changes among individual commodities. The cost of money has been greatly reduced, which should permit borrowing for productive purposes. Liquidation has in several industries almost run its course, while production has been severely limited for a considerable period, with the result that stocks of many commodities are no longer to be classed as excessive. Moreover, the demand on the part of the ultimate consumer of goods does not appear to be diminishing, although the public is buying with more discrimination than formerly.

"With the present low money rates, with the credit situation well on the road to clearing up, with production costs better adjusted to the new price level and lower transportation costs, with commodity prices relatively stable, and the continuance of the public demand for consumption goods, the attitude of business men may well be one of confidence. Improvement in general business, though moderate, should characterize the year 1922, unless the numerous adverse factors which have been repeatedly discussed in the *Survey* become more menacing than they are at the moment.

"A continuance of the decline in interest rates and of the rise in investment values, as well as the appearance of a degree of stabilization in commodity prices, are generally looked upon as factors contributing to the laying of a firm foundation for the revival of business."

Factories Show Better Business

Improved business conditions as well as seasonable activity were seen in the increase of 59c. in the average weekly earnings of New York State factory workers from November to December, State Industrial Commissioner Henry D. Sayer announced Jan. 30. In compiling the average, reports from 1,648 representative manufacturing plants were taken. The average weekly earnings of factory workers in the state in December last were $24.01, or 12 per cent less than the average of the preceding December. The U. S. Bureau of Labor Statistics reported, it was said, that the cost of living in both Buffalo and New York City from December, 1920, to December, 1921, declined 12 per cent.

Large Car Orders to Be Placed

Predictions that 1922 would be one of great activity for car manufacturers have been made by Max Epstein, president of the General American Tank Car Co. That plant, he said, was operating about 75 per cent of capacity with an early increase in sight. "Orders for at least 15,000 freight cars now pending will be placed within the next three or four weeks," he said. The largest inquiries are from the Burlington, Great Northern and Northern Pacific.

Freight Loadings Gain 17,398 Cars

Cars loaded with revenue freight during the week ended Jan. 21, totaled 738,275, compared with 720,877 during the previous week, or an increase of 17,398, according to the American Railway Association. This was 29,617 cars more than were loaded during the corresponding week in 1921 but 66,591 less than during the corresponding week in 1920. Coal loadings totaled 164,091 cars, a gain over the preceding week of 4,846 but 4,088 below the total for the corresponding week last year.

Record Tire Order Filled

A record shipment just made by the Goodyear Tire & Rubber Co. is cited in some quarters as substantiation of the belief that better times in the export market are at hand. That company has just shipped twenty-three carloads of tires from Akron, consigned to a single customer in Continental Europe. This is said to be the largest single export shipment of tires ever made to an individual consignee.

Railroad Lays Off 1,500 Men

The Chicago, Milwaukee & St. Paul Railroad shops at Milwaukee, laid off 1,500 men Feb. 1. The employees have demanded a return of the seniority rule. Heretofore all employees have been on half-time work. Under the new ruling old employees will work full time and young employees will be laid off.

Cities Keep Up Employment

Reports from various localities indicate that the recent falling off in employment has been less than anticipated, Cononel Arthur Woods, chairman of the Standing Committee of the National Conference on Unemployment announces. Efforts of the cities throughout the country, he declared, have done much to mitigate the situation. "Many cities," he said, "report that they are appropriating funds, in addition to the regular budget, to relieve distress by furnishing employment. Work that otherwise would be delayed until spring or early summer has been started at once."

Harvester Plant Reopens

Encouraged by new orders and improved prospects for future business, the International Harvester Co. has resumed operation of its plant at Milwaukee, Wis., which specializes in the manufacture of tractors, farm engines and cream separators.

Pittsburgh Expects Building Boom

With the building trades strike settled after several months of negotiations, operations are expected to be started soon on construction projects estimated at $85,000,000.

Penna Would Cut Indiana Wages 30 Per Cent Now, and More Later, If Necessary

SERIOUS wage disputes between miners and operators in the Central Competitive Field are forecast by a statement issued by Phil H. Penna, of Terre Haute, secretary of the Indiana Bituminous Coal Operators' Association, in which he asserts that the miners will receive a reduction of 30 per cent after the expiration of present two-year contracts, March 31. Mr. Penna expects the reduction to be brought about by an agreement between the miners and the operators or by government intervention.

The wage scale, Mr. Penna asserts, should be made subject to modifications at given intervals within the life of the contract, depending on labor prices in the non-union fields. The fields which would be affected by the reduction are in Indiana, Ohio, Illinois and western Pennsylvania.

William Mitch, secretary-treasurer of district No. 11, United Mine Workers of America, in answering the statement of Mr. Penna, asserted that a 30-per cent reduction in the wage schedule and a short-period contract subject to numerous changes would make the operators secure as dictators.

Other points to be sought by the operators are contained in Mr. Penna's statement as follows:

"The production of bituminous coal in the United States for the year 1921 was the smallest since 1911, amounting to 407,000,000 tons, the next lowest being 423,000,000 tons in 1914 and the highest production during those years was 579,000,000 in the year 1918.

"The consumers of coal have been amply supplied and all their demands met for both domestic consumption and export trade and the only reason that there has been no more coal mined is that the people did not want it. How much more coal would have been consumed if the cost of production and the freight rates were materially less cannot be estimated with any degree of satisfaction, but it is fair to presume that it would have been practically negligible.

"We cannot agree, as I see it, to a wage contract which ties our hands for two years and leaves other large coal-producing sections free to make wage schedules below ours. To do so would show a woeful lack of business acumen. This is especially true in view of the fact that the United Mine Workers, not hesitating to ignore contract provisions when increases were obtainable, have stolidly refused to permit or even consider modifications when the tendency was downward, alleging that because our present contract was made in obedience to the orders of the United States Government it was not subject to any modification.

"Again, any new contract must provide that the coal operators be permitted to manage their own properties without unwarranted interference of the union with the management. One large item of expense of producing coal is union interference in every detail of operation and in most instances without benefit to themselves. This is a glaring economic waste.

"Furthermore, any contract made must carry with it collective obligations and the union must be made responsible for the observation of its provisions. No organization should be permitted to participate in making contracts without being responsible to the men with whom they contract and to the public for the discharge of the obligations imposed. In this way we can come nearer equalizing most of production as between districts and so place each section of the country on a fair competitive basis. Competition for business is keen and with a producing capacity of 700,000,000 tons of bituminous coal annually and with a demand under normal conditions of 550,000,000 tons, that competition will be more and more intensified.

"The coal industry in Indiana is suffering in its natural markets because of coal from sections where a lower wage scale obtains and, added to this, high freight rates to our market. For instance, since 1916 our freight rate to Chicago has increased from 77c. per ton to $1.78 per ton, or about 126 per cent, while during this same period the rate from West Virginia and eastern Kentucky has increased only 75 per cent."

Wadleigh Proclaims Gospel of Helpfulness

F. R. WADLEIGH, of the Coal and Coke Section of the Department of Commerce, has authorized the following statement:

"The Coal and Coke Section of the Fuel Division of the Bureau of Foreign and Domestic Commerce has been organized and is in existence for the purpose of assisting every branch of the coal and coke industries in promoting and increasing their business, both foreign and domestic.

"The Bureau of Mines is co-operating in this work and in the selection of subjects and problems that call for both technical and commercial consideration and investigation—commercial engineering—coal storage, purchase and selection of coal—sampling and preparation, inspection, methods of use, both industrial and domestic, new fuels and processes, etc.

"Closely associated with all of these activities and vital to their success is the problem of education of all interested in the industries, but mainly of the great coal-buying and using public. The necessity of educating the coal-purchasing public, both industrial and domestic, in the problems of the coal industry is of paramount importance today. We believe that a clear comprehension of the outstanding facts of the coal industry by the business men of the country will do much to clarify the present confused state of the public mind and be instrumental in creating an understanding and attitude of fairness, which will be of distinct benefit to the coal industry and the country at large.

"To make our work of the greatest possible value we want your assistance and co-operation. Let us know how we can help you, how we can best obtain concrete and definite results. Give us your advice, give us your problems, put us in a position to assist you, but understand that there is no question of regulation or obligation involved.

"We want to give service and ask only that you work with us and help us in our efforts."

Now They Admit They Did It Themselves, Though They Blamed It on the Deputies

A SURPRISE was sprung in connection with the trial of about fifty persons charged with complicity in the frequent attacks on Willis Branch in the New River field covering a period of a year, when Tom Lewis, alias Tom Canady, and George Lafferty entered a plea of guilty in the Circuit Court of Fayette County to the charge of attempting to murder D. E. Grady and C. E. Branscome, the lone defenders of the Willis Branch property, on the night of Feb. 18, 1921. Each of the prisoners was sentenced to a year and a day in the state penitentiary. Four men convicted last summer of dynamiting the property of the Willis Branch Coal Co. and serving sentences in the West Virginia penitentiary are in Fayette County ready to testify as state's witnesses against some of those accused of other overt acts in connection with the Willis Branch trouble.

When this disturbance was at its height the charge was frequently made by union miners that the shooting was being done by members of the Baldwin-Felts detective organization, although it was known at the time that there were no members on guard at this property. Confessions and indictments have served to disprove such charges.

A STUDY OF the unsaturated hydrocarbons in industrial gases is being made by the Bureau of Mines with a view to developing economic methods for the manufacture of alcohols from them. Ethyl and propyl alcohols in particular are being sought. Gas distilled from a mixture of oil and coal is at present being studied in co-operation with the Trent Process Corporation, of Washington, D. C.

Smokeless Output Declines 2,565,855 Tons; High Percentage on Navy List

FIGURES covering the production of smokeless coals in West Virginia for the past year, in comparison with the year 1920, as prepared by the Winding Gulf Association, make interesting revelations. It will be recalled that the largest tonnage ever produced by the smokeless fields of West Virginia was in the year 1916, when approximately 36,000,000 tons were produced. The data for last year and the preceding year follow:

PRODUCTION WEST VIRGINIA SMOKELESS COAL, 1921 AND 1920

District	Tonnage 1921	Tonnage 1920	Decrease	Increase
Pocahontas	13,206,480	15,421,288	2,214,808	......
New River	6,814,082	7,065,225	251,143	......
Winding Gulf	5,714,046	5,813,950	99,904	......
Tug River	4,130,714	4,073,665	....	57,049
Totals	29,865,322	32,374,128	2,565,855	57,049

The large decrease in production of smokeless coal in the Pocahontas district is due to curtailment of shipments of the U. S. Coal & Coke Co., this one shipper decreasing output more than one million tons in 1921.

It is estimated that 25 per cent of all West Virginia smokeless coals is consumed by the byproduct plants. The Winding Gulf Operators Association office has prepared figures showing just what tonnage of smokeless coals was consumed by the same producers. Of course, in addition to this tonnage, large purchases of slack smokeless coals are bought in the market to furnish those byproduct plants that have no mines of their own.

WEST VIRGINIA SMOKELESS SHIPPERS CONSUMING THEIR OWN PRODUCT

	Tonnage 1921	Tonnage 1920	Decrease	Increase
Pocahontas District:				
U. S. Coal & Coke Co.	2,229,800	3,310,050	1,080,250	......
Algonquin Steel Co.	241,100	250,450	9,350	......
By-Products Pocahontas	91,250	42,350	....	48,900
Tug River District:				
Solvay Collieries	225,900	429,150	203,250	......
New River District:				
Milwaukee Coke & Gas	78,470	286,160	207,690	......
Winding Gulf District:				
Richmond Ry. & Power	149,282	106,826	....	42,456
	3,015,802	4,424,986	1,500,540	91,356

Further figures furnished from the office of the Winding Gulf Operators Association show that the following tonnage of West Virginia coals was used by the U. S. Government during 1921:

	Net Tons
U. S. Navy Yards and vessels	695,000
Government Fuel Yard at Washington	58,000
Bunkers at Panama	625,000
Operating Panama Canal and railroad	300,000
Total	1,678,000

Compilations by the Winding Gulf Operators Association on West Virginia smokeless coals show that 89 per cent of New River Coal is on the navy acceptable list; Pocahontas, 68; Winding Gulf, 57.5; Tug River, 26.

Kanawha Field Will Post Wage Scale About March 1, to Be Effective from April 1

THE new scale for the Kanawha field of West Virginia, to become effective April 1, will not be posted until about March 1. At a recent meeting the board of directors of the Kanawha Coal Operators Association determined to defer any action on a new wage scale until late in February, having in view the conditions in the Central Competitive Field and also the coming convention of the United Mine Workers. At the meeting of the directors, who also act as a scale committee, there was a discussion of conditions both from a humanitarian and a business standpoint.

Although no effort was made late in January to fix a scale, D. C. Kennedy, secretary of the association, has announced that he has been given authority to call another meeting of the board of directors before the regular meeting on Feb. 24 for the purpose of fixing a scale, if that shall be considered advisable. The board was advised by Mr. Kennedy that in his endeavor to negotiate a new contract he had communicated with the miners' officials through personal interviews and otherwise, but had been unable to obtain a conference with the representatives of the United Mine Workers. In every instance he had met with the reply that it was not possible to negotiate any wage scale until after an agreement had been negotiated in the Central Competitive Field. The directors of the Kanawha association take the position that to await the action of that field would postpone matters too long, for the representatives of large companies already have been notified by some of their large contract customers that orders will be transferred to the non-union fields after April 1, lower prices being given as one of the reasons for the change. Some of these makers of contracts, however, are transferring to the non-union fields in order that their contracts may be filled without fail during the strike that seems likely to occur on April 1.

Engineers of Northeastern Pennsylvania Hold Annual Meeting at Scranton

ON THE evening of Jan. 26 the Engineers Society of Northeastern Pennsylvania held its annual banquet at the Jermyn Hotel, in Scranton, about 450 members and guests being present. This banquet was one of the most successful held in recent years, C. E. Tobey, of Binghamton, acting as toastmaster.

Floyd L. Smith, past president, was the first speaker, and his theme was the financial condition of the society. He was followed by George E. Stevenson, the new president, who spoke on the new law licensing engineers. Mr. Stevenson intends to fight this measure and to show that it is unconstitutional. A petition was circulated with the request that the engineers present sign it, thus showing their disapproval of the law. Subscriptions also were asked, the proceeds to be used in carrying the case through the courts.

William Griffith, consulting engineer, then spoke on the progress of mining during the past twenty-five years. He pointed out that a quarter of a century ago there were 407 collieries in the anthracite field with an output of about 50,000,000 tons per year, whereas at the present time there are only 260 collieries yet they have an output of 80,000,000 tons. The decrease in number of mines is due mainly to the use of electricity. Twenty-five years ago only the thick beds of coal were being operated, while now thin beds—in some cases only 24 in. thick—are being worked.

W. S. Murray, consulting engineer, followed Mr. Griffith. He spoke on the proposed super-power system, the basic idea of which is the generation of electric energy at great central stations in the mining regions and near tidewater and the distribution of current by high-tension line at about 110,000 volts to the large manufacturing centers. The units in the power stations will be of 30,000-kw. capacity each, while individual plants will be able to generate from 300,000 to 400,000 kw. It is proposed to install three plants in the anthracite region, one at Pittston, one at Nescopeck and one at Sunbury. Mr. Murray said that the plant at Pittston would take the full flow of the Susquehanna River for condenser water when it was low. Such a system will show large savings in the consumption of coal and will largely reduce the amount of fuel that must be transported by the railroads.

Standardization Bureau of Mining Congress Issues Bulletin on Mining Equipment

MINE operators and engineers interested in standardization of mining equipment, or in improving the methods and practices in mining, will be interested in the second standardization bulletin, just published by the Standardization Division of the American Mining Congress, Washington, D. C. It contains the recommendations of the committees from the coal and metal branches. These committees are composed of mining operators, engineers and manufacturers. The bulletin also contains the discussions of the reports which were presented at the Second National Standardization Conference held in Chicago, Oct. 17 to 22, 1921.

The bulletin contains reports and recommendations of the following committees of the coal mining branch: Underground Transportation, C. E. Watts, chairman; Mine Drainage, E. D. Knight, chairman; Mine Ventilation, W. J. Montgomery, chairman; Outside Coal-Handling Equipment, Henry M. Payne, chairman; joint report by the Underground Power Transmission, A. B. Kiser, chairman, and Power Equipment, H. A. Pauly, chairman.

Illinois Miners' Earnings, Nov. 15-Dec. 15

EARNINGS during the two-weeks' period Nov. 15-30, 1921, of workers in 99 Illinois mines employing 38,597 men, who produced a tonnage of 1,183,901, are shown in the subjoined tables. This is approximately 27 per cent of the mines, 45 per cent of the miners and 48 per cent of the total tonnage of the state for the period here shown. Total disbursement was $2,365,403.79. The mines included in this showing are located in all parts of the state and operate in coal seams ranging in thickness from 36 in. to 9 ft. The data, provided by members of the Illinois Coal Operators' Association, were compiled by F. C. Honnold.

There are three coal operators' associations in Illinois, whose members operate a total of 373 shipping mines. The Illinois Coal Operators Association is the largest, having 179 mines, located in all parts of the state and producing normally about 58 per cent of the total tonnage of the state. The Coal Operators Association of the 5th and 9th Districts has 158 mines, all located within an average distance of 30-35 miles of East St. Louis, and producers about 31 per cent of the tonnage. The Central Illinois Coal Operators Association has 36 mines and produces about 11 per cent of the tonnage.

EARNINGS FOR TWO-WEEKS PERIOD, NOV. 15-30, COMPARED WITH THOSE OF DEC. 1-15, 1921

							—Southern	Illinois	Counties—		
	Northern Illinois	Danville	Fulton-Peoria	Springfield	Centralia	Duquoin	Franklin	Williamson	Saline	State Totals and Averages	State Totals and Averages Dec. 1-15
1. Number of Mines	8	6	14	12	4	5	22	17	11	99	109
2. Av. work time (days)	4.5	7.8	7.7	6.6	8.3	5.2	5.3	7.4	6.7	6.5	6.7
3. Tonnage	43,942	32,770	94,797	121,533	73,736	46,055	392,158	230,254	148,656	1,183,901	*
4. Total employees	2,825	624	2,985	4,083	1,910	1,750	13,866	5,849	4,705	38,597	42,193
5. Av. daily number all employees working at these mines	2,535	588	2,686	3,905	1,737	1,622	12,201	5,366	3,900	34,540	37,788
6. Number earning $50 or more in two-week pay period	390	517	1,941	2,293	1,472	823	7,316	4,232	2,263	21,247	22,469
7. Av. earnings group 6 2-week period	$73.45	$79.64	$80.12	$77.09	$82.45	$76.19	$80.07	$89.73	$81.52	$79.51	$82.46
8. Percentage (group 6) to av. number working daily (group 5)	15.4	88	72.3	58.7	84.8	51	60	78.9	58	61.5	59.5
9. Percentage of total payroll paid to those making $50 or over	30.4	91.5	81.8	73.4	86.7	68.9	74.2	88.2	68.9	73.8	74.9
10. Number of men on payroll in excess daily average working (excluding mine office)	290	36	299	178	173	128	1,665	483	805	4,057	4,405
11. Percent absenteeism	10.3	5.8	10	4.6	9.1	7.5	12	8.3	17	11.7	10.4
12. Occupational deduction	$410.71	$982.54	$9,847.52	$4,863.36	$4,496.18	$2,390.73	$16,512.05	$15,547.81	$3,912.14	$58,963.04	†
Per capita	.148	1.577	3.34	1.22	2.38	1.39	1.215	2.726	.852	1.629	1.555
13. Check-off for miners' union dues and assessments	$4,238.64	$1,151.86	$7,972.61	$8,333.15	$5,246.68	$4,066.87	$4,168.29	$15,010.75	$15,826.01	$103,527.85	‡
Per capita	1.524	1.85	2.70	2.90	2.78	2.363	3.07	2.632	3.45	2.86	3.336
14. Av. deductions per ton:											
Occupational	.0093	.03	.104	.04	.061	.052	.042	.068	.026	.05	.05
Union dues	.095	.035	.084	.068	.071	.088	.106	.065	.107	.087	.108
Total	.1043	.065	.184	.108	.132	.14	.148	.133	.133	.137	.158

*Tonnage, 1,277,325. † Occupational deduction, $64,349.65. ‡ Check-off, $138,047.29.

AVERAGE DAILY EARNINGS BY CLASSIFICATIONS

							—Southern	Illinois	Counties—		
	Northern Illinois	Danville	Fulton-Peoria	Springfield	Centralia	Duquoin	Franklin	Williamson	Saline	State Totals and Averages	State Totals and Averages Dec. 1-15
Machine Runners:											
Number of men	......	18	136	151	82	55	553	183	193	1,371	1,397
Av. earnings for the pay-period	......	$93.55	$94.52	$79.04	$95.85	$67.10	$80.78	$98.86	$84.91	$85.48	$87.11
Av. for days mines hoisted coal	......	11.99	12.28	11.98	11.55	12.90	15.24	13.36	12.67	13.15	13.00
Av. based on every working day in 2 week period (12 days)	......	7.80	7.88	6.59	7.99	5.59	6.73	8.24	7.08	7.12	6.70
Loaders:											
Number of men	66	179	1,095	1,157	760	307	3,287	2,389	1,163	10,403	11,173
Av. earnings for the pay period	$57.40	$68.57	$74.99	$70.54	$83.73	$71.90	$75.58	$85.24	$75.08	$71.87	$77.82
Av. for days mines hoisted coal	12.76	8.79	9.74	10.69	10.09	13.83	14.26	11.52	11.21	11.05	11.62
Av. based on every working day in 2 week period (12 days)	4.78	5.71	6.25	5.88	6.98	5.99	6.30	7.10	6.26	5.99	5.98
Av. tonnage of loaders for days mine worked	5.5	7.4	7.5	8.6	9.5	10.1	12.1	9.8	10	9.36	9.1
Day Men:											
Number of men	324	320	710	985	630	461	3,476	1,660	906	9,051	9,899
Av. earnings for the pay-period	$76.71	$85.05	$85.27	$81.70	$79.17	$80.14	$84.20	$95.17	$89.41	$88.91	$86.99
Av. for days mines hoisted coal	17.05	10.90	11.07	12.38	9.54	15.41	15.89	12.86	13.35	13.68	12.98
Av. based on every working day in 2 week period (12 days)	6.39	7.09	7.10	6.81	6.60	6.68	7.02	7.93	7.45	7.41	6.69
Total (all classifications):											
Number of men	390	517	1,941	2,293	1,472	823	7,316	4,232	2,263	21,247	22,469
Number of mines	8	6	14	12	4	5	22	17	11	99	109
Av. days mines worked	4.5	7.8	7.7	6.6	8.3	5.2	5.3	7.4	6.7	6.5	6.7
Av. earnings for the pay-period	$73.45	$79.64	$80.12	$77.09	$82.45	$76.19	$80.07	$89.73	$81.62	$79.51	$82.46
Av. for days mines hoisted coal	16.33	10.21	10.41	11.68	9.93	14.65	15.11	12.13	12.18	12.23	12.30
Av. based on every working day in 2 week period (12 days)	6.12	6.63	6.68	6.42	6.87	6.35	6.68	7.47	6.80	6.63	6.34

Believing Coal Strike Unavoidable, Attorney General Formulates Plan; Observers Predict Failure

By Paul Wooton
Washington Correspondent of *Coal Age*

The action taken by the operators in the Pittsburgh and southern Ohio districts leads coal specialists in and out of the government service in Washington to the belief that there now is little chance of avoiding a strike. The Attorney General has made it clear that he regards the situation as being sufficiently serious to justify the formulation of complete plans for the part he expects to play in case a strike is called. It is assumed in Washington that eastern Ohio and northern West Virginia will follow the precedent established by the other operators and announce equivalent reductions. As it is assumed that the United Mine Workers will not accept a 40-per cent reduction without a struggle, the various agencies in the national capital are trimming their sails for what they believe to be an inevitable industrial squall.

The action of John L. Lewis, president of the United Mine Workers, in making a special effort to interest the switchmen and shopmen in the strike, came as no surprise, but significance is attached to the fact that he made the letter public. This is taken to indicate that the negotiations already are well advanced, if not concluded. This action on the part of the United Mine Workers is an obvious development. Despite large expenditure and great effort, the non-union fields were not organized. The next best thing from the standpoint of that organization would be to interfere as much as possible with the distribution of coal from non-union mines. An indication that Mr. Lewis has no serious hope of interesting the four brotherhoods is the fact that the names of these organizations appear at the end of his list. It is fully realized that he can bring about serious dislocation if he can persuade the switchmen and the shop crafts to enter the fight with the United Mine Workers.

There is much speculation as to whether or not central Pennsylvania operators will follow the lead taken in the Pittsburgh and southern Ohio districts. That move is regarded as having been good tactics from the operators' point of view, but it dissipated the hope that the strike could be avoided.

There has been increased evidence during the last week that the anthracite miners are willing to cast their fortune with the bituminous workers. If they are not already pledged, it is apparent that such a step is highly probable. Organized labor as a whole recognizes the possibilities of the situation and there are evidences of solidarity among labor which insures material assistance for the United Mine Workers. On the other hand disinterested observers are of the opinion that such a strike has little chance for success.

With the domestic demand practically out of the way by April 1, the non-union fields are in a position to supply practically all the coal that the country will use. Stocks sufficient for six weeks or more will have been built up by the railroads, public utilities and most of the industrial consumers. There would be no deep-seated regret on the part of many industrial plants if they were forced to close down for a month or so this spring. Conditions hardly could be more adverse, from the standpoint of the United Mine Workers, but on the other hand it is realized that the Mine Workers have unusual leadership. Under such generalship as that possessed by John L. Lewis, it is a generally held opinion that the Mine Workers are going to capture some of their objectives, despite the fact that the economic situation is against them and a large percentage of the operators are more than willing to grapple in a finish fight on some of the points involved.

Wadleigh to Collect Data on Coal Storage

Data with regard to operating and maintenance costs of coal storage is to be collected jointly by the Bureau of Mines and the Department of Commerce under the immediate direction of F. R. Wadleigh, of the Fuel Division of the Bureau of Foreign and Domestic Commerce. Information also will be collected as to methods of storage. No effort will be made to gather information from all who store coal, but some 300 names have been selected as those most likely to have had typical experience and whose costs would be representative. As a result of this inquiry, it is expected that the latest experience in coal storage matters will be assembled.

League of Industrial Democracy Protests Increase of Coal Prices with Wages

An attack on the anthracite coal operators' move to increase the price of coal in accordance with proposed wage increases was made Feb. 2 by the League for Industrial Democracy, a new organization of self-termed engineers, economists and technicians with headquarters at 70 Fifth Avenue, New York City.

The organization was recently launched as a successor to the Intercollegiate Socialist Society, and announces that it has "graduated from the colleges into the larger field of industrial conflict," where its program calls for "production for use, not for profit." At the head of the league are Robert Morss Lovett, president; Charles P. Steinmetz, Arthur Gleason, Florence Kelly, Evans Clark, Normal Thomas, Roger Baldwin, Stuart Chase and Harry W. Laidler.

A committee of experts is being formed to investigate the relation of the price of coal to labor and the organization of the industry. The preliminary statement, issued by Harry W. Laidler, research director, is based on information already procured. Among the claims are: (1) A strike of anthracite coal miners will result on April 1 unless the present controversy is adjusted. (2) The margin of profit made by the anthracite mine owners in the last few years indicates that it is not necessary to pass a miners' wage increase on to the consumer. (3) The claim that $3.92 of a gross cost of $5.55 for a ton of hard coal is labor cost is open to question.

Additional investigations in other industries are to be made by the new organization according to Mr. Laidler.

Board Reports on Nova Scotia Wage Cut

The Board of Conciliation appointed to investigate the wage dispute between the British Empire Steel Corporation and the mine workers in their employ has made its report. The majority, comprising U. E. Gillen, chairman, and Colonel W. E. Thompson, the company representative, recommend for adoption the schedule fixed by the McKinnon award, except that the wages of the daymen, who received $3.25 or under per day under that award, be reduced 12½ per cent and the wages of all others be reduced 20 per cent. The McKinnon award was made early in 1920 and the rates then fixed were afterward considerably increased. The minority report, by Mayor Ling, of Waterford, N. S., the miners' representative on the board, recommends that contract rates prevailing Dec. 31, 1921, be reduced 14 per cent and that a minimum rate of $3.50 per day be established for detail workers, other than boys.

Progress is being made by the interdepartmental committee on co-ordination of coal purchases. The committee is completing its tabulation of data in regard to government coal purchases. It is believed that this is the first time that complete information as to the methods of all government bureaus have been tabulated.

Dauphin County Court Upholds State Anthracite Tax

Unanimous Opinion Declares Impost Constitutional—Finds Difference Between Anthracite and Bituminous Coal Permits Tax Without Discrimination

A SUIT in equity recently was brought in the Court of Common Pleas of Dauphin County, Pennsylvania, to determine the constitutionality of the anthracite tax law approved May 11, 1921, the defendants being the Thomas Colliery Co., Herbert Suender, its superintendent; the several directors of the company, S. S. Lewis, Auditor of Pennsylvania, and C. A. Snyder, State Treasurer. As a result on Feb. 2 the judges of the court unanimously rendered a decision requiring the payment of the tax.

The court ruled that the decision regarding the act of June 27, 1913, whereby a similar tax, but of 2½ per cent instead of 1½ per cent, was imposed, was not binding in this case though rendered by a superior tribunal, the State Supreme Court. In that case the court did not find that there was any difference between anthracite and bituminous coal, being guided by the findings of the judge in the lower court. The court in the present case found that there was a difference between the two kinds of coal such as would permit the imposition of a tax on either one without any charge of discrimination under Section I, Article IX, of the Constitution, providing that all taxes "shall be uniform upon the same class of subjects within the territorial limits of the authority levying the tax."

Judge Frazer, who filed a dissenting opinion in the previous case, refused to be bound by the decision of the lower court, that there was no classifiable difference between anthracite and bituminous, because it was well known that there was such a difference and because their coming under a common classification could not be established by the evidence that 40 per cent of the anthracite produced came in direct competition with bituminous. Judge Frazer was overruled by the other judges in that case, but the judges in the present case believed there would be no "judicial effrontery" in coming to a different conclusion if the two coals were proved by evidence to be capable of being placed in a separate legal category. The court trying the present case made many findings all to the effect that there really was such a difference and held that even though anthracite and bituminous coal did not compete they were essentially different in their appearance, nature, characteristics and uses. The court refused to find that "anthracite is used for the same purposes as bituminous, semi-bituminous and semi-anthracite coal."

Quoting Justice Clark's decision (Commonwealth vs. Delaware Division Canal Co.) as follows: "Nor is classification necessarily based upon any essential differences in the nature, or indeed, the condition of the various subjects; it may be based as well . . . upon well-grounded considerations of public policy," the court found that the legislative body, finding anthracite approaching exhaustion, might want, for purposes of public policy, to conserve it for future use by taxation.

Showing that the United States had placed coal in separate classes in eight separate acts of Congress, that Canada in levying import taxes had placed anthracite and bituminous coal in separate groups and that the railroads had separated them into different classifications, the court found that the classification is "one which actually exists in the business world."

The tax being uniform on all anthracite coal, the court found it constitutional, even though no notice regarding it had been published in the anthracite region. It was not, the court said, a local or special law. A certain contradiction in its terms did not render it unconstitutional because of its being unenforceable. It is time enough, said the court, to raise that question when a penalty is imposed under the statute.

THE COST OF LIVING is still about the same—all a fellow has.—*Toledo Blade.*

Three Fatal Explosions Occur in Mines in Pennsylvania, Kentucky and Alabama

TWENTY-FIVE men, composing the night force of mine workers in the Ross Section (Butt. No. 19) of the Gates mine of the H. C. Frick Coke Co., south of Brownsville, Pa., were killed as the result of an explosion which occurred at 1.30 a. m., Feb. 2. Apparently most of the men thus killed were either poisoned or asphyxiated by the fumes and gases developed by the explosion.

Many of the men were buried under falls of slate and coal but the positions of their bodies and the means they had taken to protect themselves from the fumes are held to have shown that they were dead when the rock fell on them. It is said that some had taken their handkerchiefs from their pockets, others had already stuffed them in their mouths, some had clogged their nostrils with their kerchiefs and others had dipped them in the coffee of their dinner pails before placing them in position as fume filters.

Four men working in another part of the mine came out safely, though two working a mile and a half from the seat of the explosion were knocked down and stunned. Some believe the explosion was due to the ignition of a gas pocket and others to an explosion of coal dust following a shot of dynamite. This latter theory is believed to be the more correct, as Peter Malik, a shotfirer, was found badly mangled and burned under a fall of slate.

The Gates mine connects with the Edenborn and Lambert workings, coal being hauled from them through the Gates mine to the waterfront. Some of the rescue work was done from the Edenborn shaft. The shaft at Gates is 685 ft. deep. The plant was opened by the American Wire & Sheet Co. about twenty years ago. Before the Frick company took it over there was an explosion that killed five men. Since then there have been no disasters of any kind at the Gates mine. The Gates disaster is the first big mine accident of the H. C. Frick Coke Co. since Jan. 27, 1891, when 109 persons were killed at the Mammoth plant by an explosion of coal dust.

Ordinarily about 1,000 are engaged at the plant. Fortunately the day of the disaster was to have been an idle one because barges had failed to arrive. The rescue work was conducted by the well-equipped rescue teams of the H. C. Frick Coke Co., the operations lasting forty hours. A train under steam was kept on a siding all day long ready to rush any injured but still living persons to the hospital. None, however, was found.

Six men were killed and two severely burned in an explosion at the mines of the Layman-Calloway Coal Co., Luce, Bell County, Kentucky, at 8:30 p. m. Jan. 30. According to John Stewart, the superintendent, the explosion was caused by an overcharge of black powder in a hole drilled into the solid, and possibly tamped by coal dust.

On Feb. 2 nine convicts were killed in an explosion of the Belle Ellen mine of the Bessemer Coal, Iron & Land Co., in Bibb County, Alabama, the explosion being due in all probability to the ignition of a gas pocket. All the bodies were recovered.

Organize to Cut New York Anthracite Price

THE Anthracite Coal Consumers' Association, Inc., having for its principal objects the lowering of freight rates on anthracite and the improvement of the quality of hard coal, was organized last week in New York City. The organization plans to cut New York's coal bill $30,000,000 per year and that of the anthracite consuming area of New York, New Jersey, Pennsylvania and New England about $100,000,000.

Dr. Henry Mace Payne is president of the association; Charles C. Haffley, vice-president; Charles S. Allen, secretary, and George Gordon Battle, general counsel. The Advisory Committee includes Charles G. Edwards, John H. Towne, and Lawrence B. Elliman.

An announcement of the association says that a reduction of New York's freight rate on anthracite to $1.31 instead of $2.61, the present rate, would leave the railroads a profit as large as, if not larger than, is made on other similar commodities.

Coal Stocks Recede a Million Tons in Two Months

Consumers Had 47,000,000 Tons on Hand Jan. 1—Would Last 32 Days if Evenly Divided and Business Active—Dealers' Yards Contained Less Anthracite, While Producers Increased Storage Reserves

BY F. G. TRYON AND W. F. MCKENNEY*

IT IS one thing to know how fast coal is being produced; another to know how adequate the production may be. Stocks in the hands of consumers measure the adequacy of production. The Bureau of Census and the Geological Survey have just completed a survey of stocks of coal of Jan. 1, 1922, following their investigation in the last quarter of 1921. The following analysis presents in somewhat greater detail than the formal report the condition of the country's reserves at this time.

At the beginning of 1922 American consumers had on hand approximately 47,000,000 tons of soft coal. This was about a million tons less than the revised figure of stocks on Nov. 1. While much above the low mark of June, 1920, it was still 16,000,000 tons, or 25 per cent, below the maximum of 63,000,000 tons reached on the day of the Armistice.

In terms of days' supply the present stock appears larger than it would in times of normal business. At the rate of consumption prevailing during December, the reserve was sufficient to last 41 days, if evenly distributed. On Nov. 1 a reserve of 43 days was at hand.

Were business active, the present stocks would last not more than 32 days, if evenly divided. But, of course, stocks are never evenly divided. No American city is without its share of consumers who through absence of necessary space, or sheer neglect, are without protection against interruption to supply. For this reason, as the country has learned by bitter experience, symptoms of a shortage of coal may develop in a few days if deliveries are completely stopped.

Moreover, stocks cannot be allowed to fall to zero; a certain tonnage—perhaps in the neighborhood of 20,000,000—is an indispensable minimum for steady operation of business.

Retail coal dealers' stocks of hard coal on Jan. 1 were smaller than on Nov. 1, but still much above those at any time of record in 1919 or 1920. Incomplete reports on producers' storage indicate that there has been slight increase since last November, at which time yards held 1,768,000 tons of domestic sizes and 2,719,000 tons of steam sizes.

From Fig. 2 the history of the coal trade for the past five years may be read at a glance. Present stocks, it will be seen, are midway between the reserves in late 1916 and 1917, and early 1920, all periods of shortage, and those at the close of the war, when all users of coal who could find the requisite storage space were heavily supplied.

On Nov. 1 the total stock was 48,000,000 tons. The subnormal production of November and December had led some observers to suppose that stocks at the end of the year would show a sharp decrease. That the decline was no greater than a million tons is to be explained by the fact that there is a lag of a week or two between production and delivery.

At this writing (Feb. 4, 1922) the trend of production is once more upward. For the first time in two months the week ended Jan. 28 saw a production sufficient to meet current consumption and at the same time add materially to stocks.

The common denominator available for comparing stocks in different localities and over different periods of time is the number of days the tonnage on hand would last at the current rate of consumption. Figures of days' supply may be misleading, however, when the rate of consumption is subnormal.

The figure of days' supply has the further weakness of all averages that the items going into it may vary greatly. Because industrial consumers as a group had 51 days' supply as of Jan. 1 it does not follow that all industrials were provided with even a week's protection against emergencies. Subject to these qualifications, the record of days' supply, by types of consumers, shown in the table, is illuminating.

DAYS' SUPPLY OF BITUMINOUS COAL IN HANDS OF VARIOUS CLASSES OF CONSUMERS IN THE UNITED STATES, JULY 15, 1918 TO JAN. 1, 1922

(Figures represent number of days supply would last at current rate of consumption at time of stock-taking.)

	July 15 1918	Nov. 11 1918	Jan. 1 1919	Apr. 1 1919	Mar. 1 1920	June 1 1920	Jan. 1 1921	Apr. 1 1921	Aug. 1 1921	Nov. 1 1921	Jan. 1 1922
Byproduct coke plants	28	35	32	23	15a	8a	29	28	31	38	42
Steel plants	27	45	42	35	9a	11a	42	38	46	46	48
Other industrials	48	71	65	47	27	24	64	47	56	67	51
Artificial gas plants	72	85	81	58	31	22	55	66	79	87	89
Electric utilities	39	49	49	48	21	22	44	48	44	54	51
Coal dealers, bituminous	15	37	39	25	13	10	30	26	42	46	33
Railroads	25	31	32	(b)	11a	10a	23a	24a	(b)	31a	35a
Total bituminous	31	45	42	31	18	15	39a	36a	39a	43a	41a

(a) Estimated from incomplete data. Subject to important revision. (b) No data.

Study of the table and of Fig. 1, in particular, will show that a sharply different policy has been followed by the public utilities, railroads and the steel industry on the one hand, and by the retail coal trade and the general industrial consumers on the other, during the past two months. The utilities, and particularly the gas works, have generally added to their reserves since last August. The railroads have accumulated what is for them a very large supply, sufficient to last 35 days. The steel and byproduct coke plants have increased their stocks, both in tonnage and in days' supply, since Nov. 1. But both the retail dealers and the general industrial consumers show decreases in coal on hand from Nov. 1 to Jan. 1.

The best guide to the geographical distribution of stocks is furnished by the industrial consumers, excluding the special group of byproduct coke and steel plants. The group as a whole reported stocks on Jan. 1 sufficient for 51 days' operations. How that average was distributed by states is shown in the map in Fig. 3. Of course what is normal for one state is not normal for another. Long-haul destinations remote from the mines regularly carry heavier stocks than do those in close proximity to mining regions. Furthermore, the quality of the coal available for storage is the factor that largely controls the size of the normal reserve.

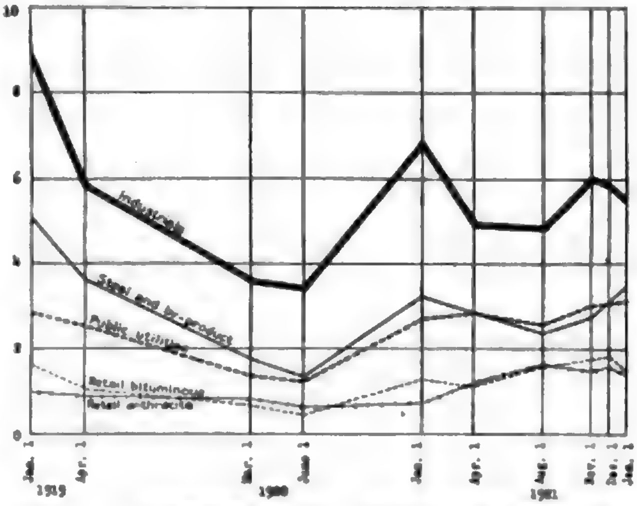

FIG. 1. FLUCTUATIONS IN TONNAGE OF COAL IN STORAGE, JAN. 1, 1919, TO JAN. 1, 1922

Lines in diagram show tons on hand at selected lists of establishments on dates mentioned. The lists are incomplete but as the same establishments are included for the several dates the figures are comparable.

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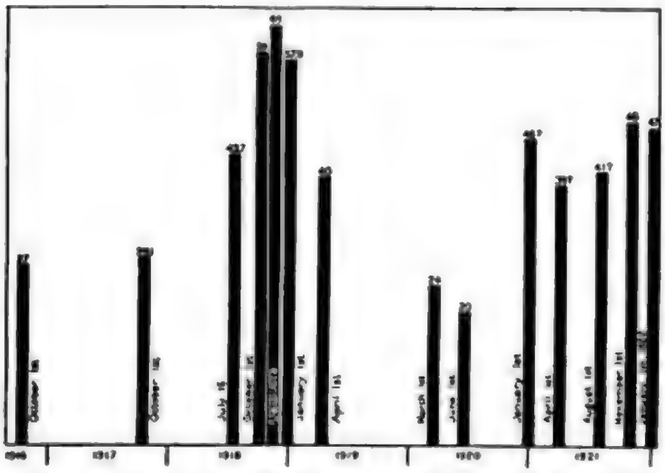


FIG. 2. TOTAL COMMERCIAL STOCKS OF BITUMINOUS COAL, OCT. 1, 1916, TO JAN. 1, 1922

Figures represent million net tons and include coal in hands of railroads, industrial consumers, public utilities and retailers. Coal for steamship fuel, on Lake docks, and in transit is not included. Figures for 1921 and 1922 are subject to revision.

Much interest attaches to the size of present stocks, in comparison with those of, say, a year ago, when reserves were comfortably large. From the map in Fig. 4 it will be seen that there was an almost universal decrease during the year 1921. Only three of the 48 states reported stocks at industrial plants larger at the end of the year than at its beginning.

Like the industrial consumers, retail coal merchants reported smaller stocks on Jan. 1 than on Nov. 1, two months before. In spite of the decrease the yards of the retailers are still well stocked.

The steel industry is a good example of the way the current rate of consumption influences the apparent size of the reserve. The actual tonnage in storage at byproduct coke plants and steel works increased from Nov. 1 to Jan. 1 by 38 per cent. But a revival of activity in the steel business so increased the current requirements that the stock in terms of days' supply increased by only 7 per cent.

As already noted, the gas and electric utilities continued to build up their stocks during the months of November and December.

According to reports received from the American Railway Association the carriers had about 35 days' supply on hand at the beginning of the year, allowing for the present reduced rate of consumption.

Coal carried in storage on the Lake docks is treated by the Geological Survey as in transit. This is necessary because it fluctuates so greatly from season to season.

The Northwestern Coal Dock Operators' Association has courteously furnished the following data showing the total bituminous tonnage on hand at commercial distributing docks on Lake Superior and Michigan: Aug. 1, 1921, 8,188,639 net tons; Nov. 1, 1921, 8,824,297 tons; Jan. 1, 1922, 7,150,654 tons. These figures are exclusive of coal on private docks of industrial concerns, such as the copper- and iron-mining companies of northern Michigan and Minnesota. The stocks of these latter companies, however, are included in the commercial storage.

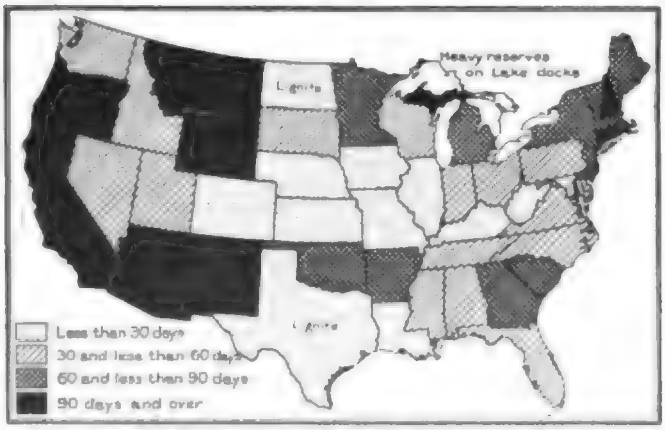


FIG. 3. DAYS' SUPPLY OF SOFT COAL ON HAND AT INDUSTRIAL PLANTS ON JAN. 1, 1922

At the rate of consumption prevailing in December, stocks at industrial plants other than steel and byproduct coke would last on the average 51 days. How the supply varied from state to state is shown in the diagram. The darker the shading, the heavier are the stocks. If business should revive and consumption increase, the stocks expressed in days' supply would be smaller. Based on reports from 2,383 plants.

From Nov. 1 to Dec. 1 the retailers continued to fill up their stocks of anthracite, and on the latter date average 50 days' supply. In December deliveries exceeded receipts, and the supply declined to 44 days. It was, however, considerably larger than at any time of record during 1919 or 1920.

On Nov. 1, 1921, the producers of anthracite had in storage at Eastern points a total of 4,487,671 gross tons, of which 1,768,091 tons were domestic sizes (including pea coal) and 2,719,580 tons were steam sizes. Complete statistics of the quantity in storage on Jan. 1 are not available, but returns so far received indicate a slight increase in the tonnage of domestic sizes and a slight decrease in the tonnage of steam sizes. The total tonnage appears to be a little larger than on Nov. 1.

The quantity of anthracite on the Upper Lake Docks as of Jan. 1 was practically the same as on Nov. 1. The Northwestern Dock Operators' Association is the authority for the following statement: Aug. 1, 1921, 1,090,258 net tons; Nov. 1, 1921, 1,316,070 tons; Jan. 1, 1922, 1,331,507 tons. The quantity of anthracite in cars at Tidewater and at the rail gateways to New England as of Jan. 1 was not unusual.

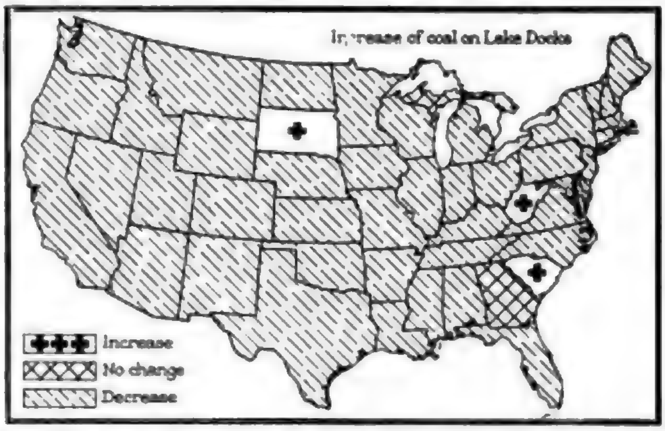


FIG. 4. HOW PRESENT STOCKS AT INDUSTRIAL PLANTS COMPARE WITH THOSE OF A YEAR AGO

Changes are shown in tonnage on hand at 1,983 industrial plants other than steel and byproduct coke from Jan. 1, 1921, to Jan. 1, 1922. In all but four states the quantity on hand at the beginning of 1922 is less than the year before.

To Introduce Range Coal, a New Size

"RANGE COAL," a combination of nut and pea, will shortly get its trial from the public, as the Lehigh Coal & Navigation Co. is changing its screens in the Tamaqua breaker to produce four sizes—egg, stove, range and buckwheat. Sizes will be screened as follows: Egg, $2\frac{7}{16}$ to $3\frac{1}{4}$ in.; stove, $1\frac{5}{8}$ to $2\frac{7}{16}$ in.; range, $\frac{9}{16}$ to $1\frac{5}{8}$ in.; buckwheat, $\frac{5}{16}$ to $\frac{9}{16}$ in.

Limits of tolerance will be: Egg, 2 per cent slate; 3 per cent bone; 5 per cent oversize; 15 per cent undersize. Stove, 3.5 per cent slate; 4 per cent bone; 5 per cent oversize; 15 per cent undersize. Range, 5 per cent slate; 5 per cent bone; 5 per cent oversize; 12 per cent undersize.

The new range size can be described as comprising virtually all the present chestnut coal and 75 per cent of the present pea coal, the remainder of the pea coal going into buckwheat. While the slate and bone percentages in the new range coal show no change from the present standard for chestnut, they are lower than in the case of the present pea coal.

Buckwheat, under the new arrangement, will have a maximum ash content of 17 per cent, to be determined by the flotation method, instead of 19 per cent, as at present.

The above program has been arranged at the request of the National Retail Coal Merchants' Association, which will distribute the new size as a test of its desirability.

Indiana Operators Throw Down Gauntlet to Miners

Follow Pennsylvania and Southern Ohio Associations by Deciding To Cut Wages Radically and Abolish Check-Off—Pending Federal Litigation Influences Them to Drastic and Determined Action

INDIANA mine owners now have thrown down the gauntlet. Following the action of both the southern Ohio and the Pittsburgh operators they have decided to post in a few days a reduced schedule of wages effective April 1. They were influenced by the litigation pending the federal courts not only to cut wages to a point only a little above pre-war basis but to abolish the check-off system without making any effort to reach an agreement with the miners. This is intended to counteract the impression once general among federal officials that there was collusion between operators and miners on wages and the check-off.

Operators in Indianapolis indicate that this is a logical step to follow from the action taken in Chicago by the Indiana Bituminous Coal Operators' Association, in adopting a resolution asserting that there is a necessity for "radical and sweeping" reductions in miners' wages.

The Indiana operators undoubtedly will announce some changes in working conditions, for in their resolution they said "the welfare of the industry" demands a change in "certain terms and conditions which have been imposed on its conduct through contracts and awards heretofore made." Chief among the changes, it is expected, will be the abolishing of the "check-off" system, by which the operators have checked the amount of union dues from each miner's pay and turned the money over to the union, acting as a collector of dues for the union. Other minor working conditions also may be changed.

It is not expected that an actual announcement of the wage reduction will be made for several days, as considerable time will have to be spent in working out the technical details of the new schedule.

The amount of the reductions is not yet apparent. However, the two associations which have acted thus far have announced reductions ranging from 30 to 40 per cent. Pick miners now are paid $1.08 a ton and day men $7.50 a day. Ohio operators are reducing day men to $4.50 and pick miners to about 70c. a ton.

Mine workers have received three increases since the war. The reductions announced thus far would take off about two-thirds of the increases hitherto granted.

Still Doubtful Whether Rail Unions Will Ally with Miners for Wage War

THE response of the sixteen railroad labor brotherhoods to an invitation to pool interests with the miners against wage reductions is still undetermined. John L. Lewis, president of the United Mine Workers, sent his letter Feb. 1 to the brotherhoods urging them to act quickly so that a conference might be held between the two great labor groups. On Monday Mr. Lewis would neither deny nor affirm a report that one brotherhood had accepted the invitation to a conference. Mr. Lewis declined to say how many replies he may have received. It is supposed that the joint conference will be in Chicago, if it is held.

On Sunday the plan for alliance was approved by the New York District Council of the United Brotherhood of Maintenance of Way Employees and Railroad Shop Laborers and the New York Council of the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees. These two New York organizations represent about 120,000 men in the metropolitan district. These councils adopted resolutions "demanding" that the international officers of the sixteen brotherhoods accept the miners' invitation and go into joint conference quickly. Of course, this action does not indicate positively the position any or all of the brotherhoods may take.

In a statement discussing his letter to the sixteen brotherhoods Mr. Lewis said the letter is an invitation for the railroad workers to "join in an economic alliance which will operate for the protection and improvement of their standard of living." He pointed out that rail workers have received reductions in wages, and said that efforts are under way to bring about further reductions, and then urges an alliance to oppose this "frenzied hysteria."

The letter was signed by W. D. Van Horn, A. R. Watkins, and N. J. Ferry, as a committee of the executive board, and Mr. Lewis. It is as follows:

> The twenty-seventh convention of the United Mines Workers of America, meeting at Cleveland, Ohio, during the year 1919, directed the international executive board to take steps toward the promotion of a closer understanding and a more harmonious relationship between the organizations representing the men employed in the railroad and mining industries.
>
> In harmony with this action, the undersigned committee of members of the international executive board held conferences with representatives of several organizations of railroad workers. Some progress was made and a report rendered to the recent convention of the United Mine Workers of America held in September, 1921. The convention by unanimous vote approved the report and the efforts made and instructed the officers of the organization to renew their efforts to bring about a satisfactory working alliance with the various organizations of railroad employees.
>
> Pursuant to this action, the committee is now addressing an identical communication to the officers of each of the sixteen major organizations of railroad workers and ventures to suggest that the time is now opportune for the holding of a meeting of accredited, representatives of each organization for the above-mentioned purpose. We would respectfully request that, as representing your organization, you give immediate consideration to the suggestions contained herein.
>
> The undersigned will be pleased to have an expression from you at the earliest possible date as to the wisdom of this policy and, if a sufficient number of favorable replies are received, steps will be taken to arrange at some mutually convenient place and time for the holding of an initial meeting of representatives of the several organizations.

Stephens Opposes Federal Distribution of Coal to Government Departments

ALTHOUGH it had previously favorably reported to the House a bill for government acquisition of the site of the present leased ground for the Government Fuel Yard in the District of Columbia, the House Committee on Mines and Mining has again taken up the subject in committee consideration. On Wednesday, Feb. 1, Roderick Stephens, president of the National Retail Coal Merchants Association, appeared before the committee in opposition to government acquisition of the property and also opposing the distribution of fuel to government deartments in Washington by the government itself. He pointed out that the large quantity of fuel handled by the fuel yard—probably 300,000 tons of bituminous and anthracite yearly—deprived the local retail coal men in Washington of considerable business. Mr. Stephens will give further testimony before the committee on Feb. 15.

Lonaconing Men Shrink from Inevitable

MINERS employed by the Maryland Coal Co. at Lonaconing, in the Georges Creek field, have spurned the proposed agreement with the company under the terms of which a rate of 85c. a ton was fixed for pick mining and 65c. a ton for machine mining. The present rates under the union scale are $1.31 a ton for pick mining and $1.10 a ton for machine mining. The Maryland Coal Co. has normally about 300 men on its payroll. It suggested the reduction in order to get wages and the cost of mining down to a point where it could obtain orders and afford employment to its miners.

Production and the Market

Weekly Review

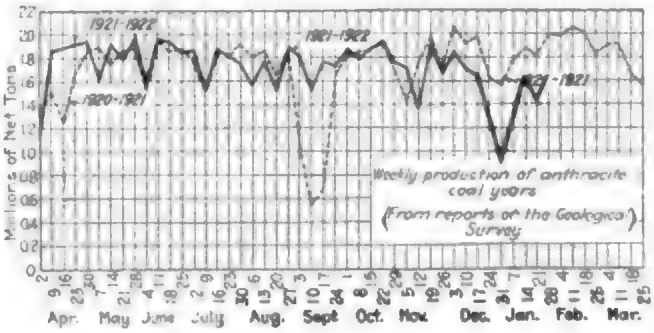
INVITATION to the railroad labor unions to join the United Mine Workers in a collective effort to prevent nation-wide wage reductions and the apparent willingness of some of the railroad workers unions to participate on this basis gives a more serious aspect to the anticipated coal strike next April. The point that the coal consumers are keeping in mind is that should the railroads be tied up or even but a certain few of them be affected the production from non-union fields, which is expected to save the day for the country, would be seriously interfered with. In other words, if John Lewis cannot call out the non-union miners on this strike he will gain the same result if the railroads employees go on strike. Whether or not this dual strike transpires, and on this there is a variety of opinion at the moment, the situation thus created is one to which buyers of coal must give serious thought. The question that must be decided is whether, in the event of a strike, they will operate on coal purchased and stored between now and March 31 or take a chance on obtaining non-union coal after April 1.

CONSUMERS AGAIN BUYING COAL FOR STORAGE

Stocks of bituminous coal on Jan. 1, 1922, according to estimates just published by the government, show approximately 47,000,000 tons in the hands of consumers, which was about 1,000,000 tons less than on Nov. 1, 1921. It is reported that the coal on hand on Jan. 1, 1922, was sufficient for 41 days' operation at the rate of consumption prevailing during December, but were business active, stocks would last not more than 32 days. Indications are that, beginning about ten days ago, coal is again being turned into storage, and that the movement in preparation for a shutdown next spring has begun to make slow headway.

Production of bituminous coal has climbed back from the low point in December and if the present rate of production is maintained will soon reach the level of October, the high point in 1921. So far prices have not been affected by this incipient buying movement. *Coal Age* Index for Feb. 6 is unchanged at 182.

So far there has been little concern manifested over the possibility of a strike in the anthracite region.

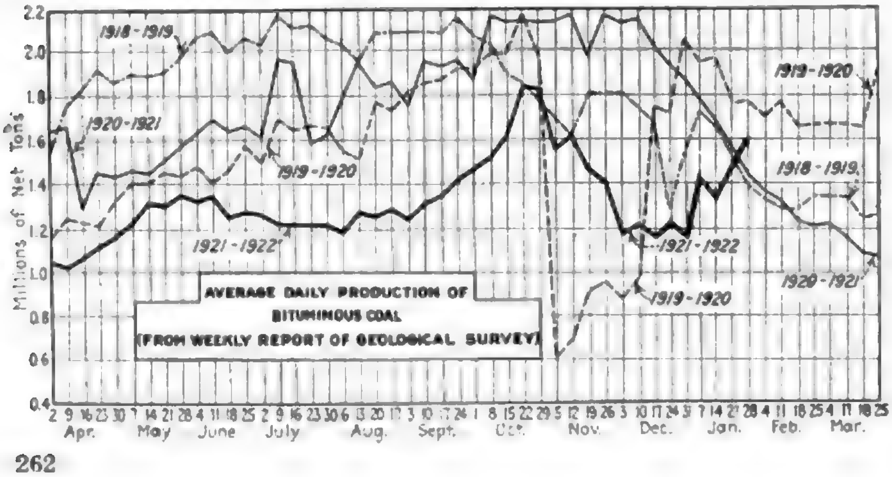


Stocks of anthracite in the hands of 648 representative dealers, according to the Bureau of Census, averaged 50 days' supply on Dec. 1, 1921, but declined to 44 days' supply on Jan. 1, 1922. Forty-four days' supply in the middle of winter is several months' supply in the summer time. Therefore, if production of anthracite is maintained equal to consumption until April 1 there need be no apprehension over a shortage of hard coal. Stocks of prepared sizes in the hands of producers is a little short of 2,000,000 tons, which reserve is, of course, in addition to that in the hands of retailers and household consumers.

BITUMINOUS

Production rose to 9,626,000 net tons during the week ended Jan. 28, according to the Geological Survey, an increase of 835,000 tons from the output of the preceding week. That production continues to gain is shown by reports of loadings for the first two days of last week—65,000 cars—which were 5,000 cars in excess of the corresponding days of the week preceding.

The number of idle freight cars declined to 555,353 on Jan. 23, compared with a total of 593,298 on Jan. 15. Of the total, 396,192 cars were in good repair. Surplus coal



Estimates of Production

(Net Tons)

BITUMINOUS COAL

Week Ended:	1921–1922	1920–1921
Jan. 14 (*b*)	8,302,000	9,936,000
Jan. 21 (*b*)	8,791,000	9,184,000
Jan. 28 (*a*)	9,626,000	8,570,000
Daily average	1,604,000	1,428,000
Coal year	340,747,000	458,449,000
Daily aver. coal year	1,344,000	1,800,000

ANTHRACITE

	1922	1921
Jan. 14	1,643,000	1,895,000
Jan. 21	1,443,000	1,819,000
Jan. 28 (*a*)	1,607,000	1,999,000

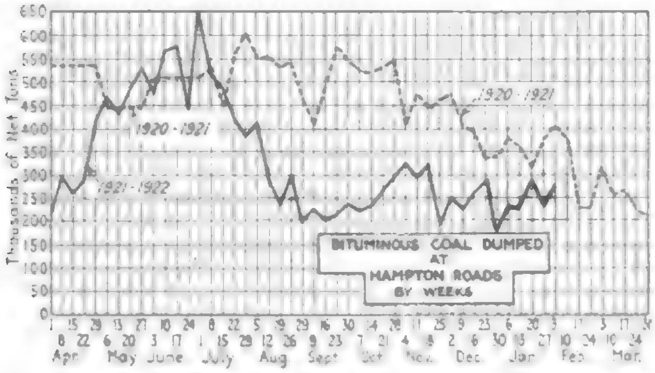
COKE

Jan. 21 (*b*)	115,000	258,000
Jan. 28 (*a*)	113,000	248,000
Calendar year	456,000	1,043,000

(*a*) Subject to revision. (*b*) Revised from last report.

cars amounted to 183,999, a reduction within the same period of 11,285.

All-rail movement to New England was 2,810 cars during the week ended Jan. 28, only 160 cars less than in the preceding week. Later reports indicate a better movement, as railroads and utilities are taking an increased tonnage for stocking purposes.



Dumpings at Hampton Roads during the week ended Feb. 2 were 271,000 net tons, as compared with 235,800 in the previous week, when severe weather hindered the movement. Coastwise freights have risen as a result of a temporary scarcity of bottoms and the fact that many vessels cleared for New England simultaneously with the lifting of the inclement weather, thereby increasing the possiblility of demurrage. Coal is not arriving at the piers in quantities heavy enough to embarrass shippers and prices are firm, despite the deplorable export situation and the fact that New England industries are not yet taking much coal in anticipation of a strike. The trouble in the textile mills in that section also tends to lower the tonnage required. Relatively good movement to New England for the last few weeks has placed that territory in very comfortable supply and only moderate buying will be necessary as a safeguard aginst any April 1 operating disturbances.

Directors of the Sewalls Point Coal Exchange will meet in Washington Feb. 11 to decide whether or not they will continue the exchange. The Virginia Ry. will ask, it is understood, that the exchange be continued until the threatened coal strike is settled. The Lamberts Point Coal Exchange will go out of operation Feb. 15, and the Chesapeake & Ohio Coal Exchange, at Newport News, will continue.

Other markets, especially in the Midwest, are experiencing a better demand. Domestic producers are actively shipping the heavy orders gathered during the recent cold spell. Fear of a strike has finally become apparent and the stocking movement is gathering momentum. Prices on all grades of coal have firmed up, in some cases premium figures

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Jan. 9, 1922	Jan. 23, 1922	Jan. 30, 1922	Feb. 6, 1922†
Pocahontas lump	Columbus	$3.40	$3.30	$3.30	*$3.20@$3.35*
Pocahontas mine run	Columbus	2.15	2.15	2.15	2.00@2.30
Pocahontas screenings	Columbus	1.50	1.50	1.55	*1.20@1.45*
Pocahontas lump	Chicago	3.10	2.85	2.85	**2.80@3.50**
Pocahontas mine run	Chicago	2.50	2.15	2.15	*1.75@2.25*
Pocahontas lump	Cincinnati	3.00	2.85	3.15	3.00@3.25
Pocahontas mine run	Cincinnati	1.90	1.90	2.05	*1.75@2.00*
Pocahontas screenings	Cincinnati	1.25	1.40	1.40	*1.00@1.40*
*Smokeless mine run	Boston	4.70	4.70	4.70	4.65@4.80
Clearfield mine run	Boston	2.05	1.95	1.95	1.65@2.25
Cambria mine run	Boston	2.50	2.45	2.45	2.25@2.70
Somerset mine run	Boston	1.80	1.80	1.90	1.75@2.00
Pool 1 (Navy Standard)	New York	3.15	3.20	2.85	2.75@3.00
Pool 1 (Navy Standard)	Philadelphia	3.00	3.00	3.00	**2.85@3.25**
Pool 1 (Navy Standard)	Baltimore	2.50	2.40	2.70	*2.50@2.60*
Pool 9 (Super. Low Vol.)	New York	2.15	2.25	2.20	**2.20@2.50**
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	2.30	2.40	**2.50@2.65**
Pool 9 (Super. Low Vol.)	Baltimore	2.10	2.10	2.45	*2.15@2.30*
Pool 10 (H. Gr. Low Vol.)	New York	1.90	2.10	2.05	1.85@2.25
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.00	2.00	2.00	**1.95@2.20**
Pool 10 (H. Gr. Low Vol.)	Baltimore	1.75	1.95	2.05	*2.00*
Pool 11 (Low Vol.)	New York	1.70	1.70	1.65	**1.65@1.85**
Pool 11 (Low Vol.)	Philadelphia	1.70	1.70	1.70	**1.65@1.85**
Pool 11 (Low Vol.)	Baltimore	1.75	1.70	1.95	*1.80@1.90*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.50	1.45	1.40	**1.40@1.60**
Pool 54-64 (Gas and St.)	Philadelphia	1.55	1.50	1.50	1.40@1.60
Pool 54-64 (Gas and St.)	Baltimore	1.40	1.40	1.65	*1.40@1.50*
Pittsburgh Sc'd. gas	Pittsburgh	2.65	2.65	2.65	2.60@2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@2.20
Pittsburgh slack (Gas)	Pittsburgh	1.80	1.75	1.75	*1.60@1.70*
Kanawha lump	Columbus	2.80	2.60	2.50	**2.50@2.75**
Kanawha mine run	Columbus	1.75	1.65	1.65	1.50@1.80
Kanawha screenings	Columbus	1.25	1.15	1.15	**1.20@1.35**
W. Va. Gas lump	Cincinnati	2.40	2.10	2.45	*2.00@2.60*
W. Va. splint lump	Cincinnati	.....	.....	.....	2.35@2.75
W. Va. mine run	Cincinnati	1.30	1.40	1.35	**1.25@1.60**
W. Va. screenings	Cincinnati	1.25	1.10	1.05	**1.00@1.15**
Hocking lump	Columbus	2.85	2.60	2.50	**2.50@2.75**
Hocking mine run	Columbus	1.75	1.90	1.90	*1.65@1.90*
Hocking screenings	Columbus	$1.45	$1.20	$1.25	**$1.25@$1.40**
Pitts. No. 8 lump	Cleveland	2.85	3.00	3.05	*2.85@3.15*
Pitts. No. 8 mine run	Cleveland	2.00	1.90	2.00	2.00
Pitts. No. 8 screenings	Cleveland	1.90	1.65	1.55	**1.60@1.75**
Midwest					
Franklin, Ill. lump	Chicago	3.80	3.65	3.65	3.25@4.05
Franklin, Ill. mine run	Chicago	2.90	2.35	2.35	2.25@2.50
Franklin, Ill. screenings	Chicago	2.00	2.05	1.90	**1.75@2.25**
Central, Ill. lump	Chicago	3.10	3.00	3.00	2.75@3.25
Central, Ill. mine run	Chicago	2.50	2.35	2.35	2.25@2.50
Central, Ill. screenings	Chicago	1.80	1.70	1.50	**1.50@1.75**
Ind. 4th Vein lump	Chicago	3.35	3.35	3.25	3.00@3.50
Ind. 4th Vein mine run	Chicago	2.55	2.55	2.40	**2.35@2.65**
Ind. 4th Vein screenings	Chicago	2.10	1.85	1.60	**1.65@2.00**
Ind. 5th Vein lump	Chicago	2.95	2.95	2.95	2.60@3.25
Ind. 5th Vein mine run	Chicago	2.25	2.20	2.20	**2.10@2.40**
Ind. 5th Vein screenings	Chicago	1.65	1.65	1.45	**1.40@1.65**
Standard lump	St. Louis	2.60	2.75	2.90	2.75@3.00
Standard mine run	St. Louis	1.85	1.95	2.00	*1.85@2.00*
Standard screenings	St. Louis	1.45	1.35	1.00	1.00
West. Ky. lump	Louisville	2.85	2.55	2.60	2.50@2.75
West. Ky. mine run	Louisville	1.90	1.80	1.90	1.60@2.25
West Ky. screenings	Louisville	1.25	1.05	0.95	**0.80@1.45**
South and Southwest					
Big Seam lump	Birmingham	3.35	2.75	2.90	2.75@3.00
Big Seam mine run	Birmingham	2.10	2.10	1.85	1.75@2.00
Big Seam (washed)	Birmingham	2.15	2.15	2.10	2.00@2.25
S. E. Ky. lump	Louisville	3.10	2.70	2.75	**2.75@3.00**
S. E. Ky. mine run	Louisville	1.65	1.55	1.55	*1.35@1.65*
S. E. Ky. screenings	Louisville	1.35	1.25	1.10	**1.05@1.25**
S. E. Ky. lump	Cincinnati	2.85	2.65	2.75	**2.75@3.00**
S. E. Ky. mine run	Cincinnati	1.40	1.45	1.45	1.35@1.50
S. E. Ky. screenings	Cincinnati	1.25	1.05	0.95	*0.75@1.00*
Kansas lump	Kansas City	5.00	4.75	5.00	5.00
Kansas mine run	Kansas City	4.10	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

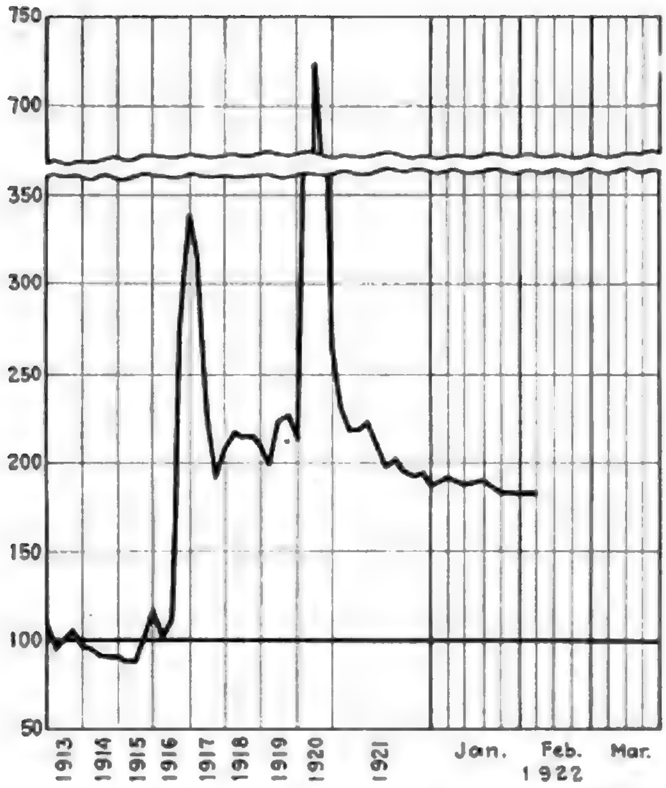
*Gross tons, f.o.b. vessel, Hampton Roads.

†Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Jan. 23, 1922		Jan. 30, 1922		Feb. 6, 1922†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	$2.61	.....	$7.60@$7.75	.....	$7.60@$7.75	.....	$7.60@$7.75
Broken	Philadelphia	2.66	$6.75@$7.50	7.75@7.85	$7.00@$7.50	7.75@7.85	$7.00@$7.50	7.75@7.85
Egg	New York	2.61	7.00@7.75	7.60@7.75	7.25@7.75	7.60@7.75	**7.50@7.75**	7.60@7.75
Egg	Philadelphia	2.66	7.00@7.75	7.75	7.15@7.75	7.75	7.15@7.75	7.75
Egg	Chicago	5.63	7.40*	6.95*	7.50*	6.95*	7.50*	6.95*
Stove	New York	2.61	7.75@8.10	7.90@8.10	7.85@8.10	7.90@8.10	7.85@8.10	7.90@8.10
Stove	Philadelphia	2.66	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Stove	Chicago	5.63	7.60*	7.20*	7.75*	7.20*	7.75*	7.20*
Chestnut	New York	2.61	7.50@8.10	7.90@8.10	7.85@8.10	7.90@8.10	7.85@8.10	7.90@8.10
Chestnut	Philadelphia	2.66	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Chestnut	Chicago	5.63	7.60*	7.20*	7.75*	7.20*	7.75*	7.20*
Pea	New York	2.47	4.75@5.50	6.05@6.45	4.75@5.50	6.05@6.45	**5.00@5.75**	6.05@6.45
Pea	Philadelphia	2.38	4.50@5.00	6.15@6.25	4.75@5.00	6.15@6.25	4.75@5.00	6.15@6.25
Pea	Chicago	5.63	6.10*	5.60*	6.10*	5.60*	6.10*	5.60*
Buckwheat No. 1	New York	2.47	2.75@3.25	3.50	2.85@3.50	3.50	**3.00@3.50**	3.50
Buckwheat No. 1	Philadelphia	2.38	2.00@3.00	3.50	2.75@3.25	3.50	*2.50@3.25*	3.50
Rice	New York	2.47	2.00@2.25	2.50	2.00@2.50	2.50	2.00@2.50	2.50
Rice	Philadelphia	2.38	1.75@2.00	2.50	2.00@2.25	2.50	*1.75@2.25*	2.50
Barley	New York	2.47	1.35@1.50	1.50	1.35@1.75	1.50	**1.50@1.75**	1.50
Barley	Philadelphia	2.38	1.00@1.25	1.50	1.25@1.50	1.50	*1.00@1.50*	1.50
Birdseye	New York	2.47	.....	2.50	.....	2.50	.....	2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type, declines in italics



Coal Age Index, 182, Week of Feb. 6, 1922. Average spot price for same period, $2.21. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram and shown in the table on the preceding page.

being given for cars in transit. The Northwestern docks are busily shipping rush domestic orders, but the steam trade is unimproved, as consumers feel that dock supplies will be there when needed.

The Navy Department has awarded a contract for 4,000 tons of bituminous coal for the Great Lakes Training Station, Ill., to the Peabody Coal Co., Chicago, at $2.80 a ton f.o.b. mines.

Inquiries for future tonnage are increasing daily. Operators, however, feel that the strike talk has a definite relation to market conditions, and as a rule are not quoting on anything but current business. It is quite evident, therefore, that prices will not be lower before April 1.

Another union producing section has come out flat-footed for a reduction of wages and the abolition of the check-off. The coal operators of Indiana held an interesting meeting in Chicago Feb. 2. These producers are confidently expecting a shut-down that will last for some time, as it is felt that the present is no time for a compromise. Wages must be reduced and the check-off must be abolished.

ANTHRACITE

Production of hard coal was 1,607,000 net tons in the week ended Jan. 28, an increase of 164,000 tons as compared with the week previous. Retail business has been greatly stimulated by the coal spell and yard supplies moved well for a short time. Retailers are ordering for replenishment only and not for reserve. Independent prices moved up a peg on both domestic and steam sizes, the latter also being in improved demand.

The decision upholding the anthracite tax law has caused some discussion among producers, some of whom advocate adding the tax directly to the price of coal as a separate item. Some operators are reported to feel that the law will pass the other courts to which it may be appealed, as the last court had all the assistance of former opinions to guide it and the present law was drawn so as to overcome former objections.

COKE

Beehive coke output was 113,000 net tons during the last week in January, practically continuing the recent rate of production. There is no regular contract market. All first-quarter contracts apparently are covered and it is too early for second-quarter negotiations. The spot market is quiet and Connellsville producers are turning their attention to the coal market in the meantime.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

Germany — Production in the Ruhr region during the week ended Jan. 21 was 1,929,000 metric tons, according to a cable to *Coal Age*. The preceding week's output was 1,885,000 tons.

Italy—Cardiff steam first, as cabled to *Coal Age*, is quoted at 37s. 3d. on the Genoa market. This has been the ruling figure since late in January.

South Africa—A conference of the Colliery Section of the Chamber of Mines has withdrawn the offer recently made to the coal miners on the ground that sufficient time has elapsed for an answer to be returned. This has resulted in notices being posted at the collieries discharging all strikers.

Belgium — The improvement in the coal market in the demand for industrial fuel shows no accentuation, but orders are more numerous. The coke market is better owing to great demand from France and Luxemburg. The domestic coal market is more active owing to the cold weather. Production of coal in December amounted to 1,965,350 metric tons. Stocks of coal on Jan. 1 amounted to 946,540 metric tons.

Poland—Coal and coke imports for the 10 months ended October, 1921, as reported by *Commerce Reports*, were as follows: Coal, from Upper Silesia, 1,936,711 tons, from Czechoslovakia, 115,934 tons; coke, from Upper Silesia, 125,366 tons, from Czechoslovakia, 82,648 tons.

Denmark—During the period January-September, 1921, there were imported into Denmark 1,308,800 tons of coal, as compared with 1,646,998 tons during the same period in 1920. The largest quantity came from Northumberland and Scotland—this is, 582,482 and 377,768 tons, respectively. Coal imports from the United States amounted to 183,099 tons, which is 460,000 tons less than in 1920. Only 218 tons were imported from Germany, as against 1,224 in 1920.

Spain—The Department of Commerce has been advised that Spain has authorized the purchase of coal from other countries, and the Department advises American firms to establish connections in Spain to obtain some of this trade.

New South Wales—The exports of coal from Newcastle (N.S.W.) during 1921 were 4,589,000 tons.

Sweden — The application made by the Spitzbergen Coal Co. requesting the State to subscribe 750,000 kr. in preference shares was granted recently. This sum has been placed at the company's disposal.

Hampton Roads Pier Situation

	Week Ended Jan. 26	Week Ended Feb. 2
N. & W. Piers, Lamberts Point:		
Cars on hand	1,788	2,021
Tons on hand	99,519	114,341
Tons dumped	119,968	112,820
Tonnage waiting	15,400	6,700
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,276	899
Tons on hand	77,000	44,960
Tons dumped	44,568	80,061
Tonnage waiting	22,787	9,989
C. & O. Piers, Newport News:		
Cars on hand	1,119	1,058
Tons on hand	55,950	52,900
Tons dumped	46,006	49,112
Tonnage waiting	.....	5,090

December Bunker Coal for Steamers

(IN THE FOREIGN TRADE)

Customs Districts:	Tons
New York	203,760
Philadelphia	22,125
Maryland	20,023
Virginia	126,266

British Seek to Reduce Cost of Export Coals; French Miners Accept Wage Cuts

British production for the week ended Jan. 21 was 4,561,000 gross tons, according to a cable to *Coal Age*. This is a slight decrease as compared with 4,719,000 tons the previous week.

Inquiries from abroad are more numerous, and if the export trade continues to indicate the improvement shown during the past few weeks the present rate of production will prove inadequate.

South Wales exports are slowly expanding, demand being chiefly in the Far East and South America. Stocks of best Admiralty large are heavier than usual. Best bunker smalls and cargo bunker smalls are scarce, with prices firm. The improvement in the British industry is mostly discernible in Scotland, where the majority of the pits are operating full time. Many of the owners also report better output per man and a greater willingness to cooperate with the management than has been apparent for some years. Scottish coal shipments for the week ended Jan. 14 were 200,139 tons, an increase of 121,595 tons over the previous week. This is approximately 100,000 tons greater than for the same week a year ago.

The fact that wages in Wales have touched rock-bottom has encouraged the men to better effort and a better spirit is manifest.

There is more trouble in the Durham areas. The miners complain that the Government has left them to stand alone to face the greatest depression in forty years. Cheaper coal by reduced dock charges, reduced transport rates and lower charges by the middleman are sought by the miners as an alternative of any further readjustment of miners' working arrangements. Ascertainments made by the accountants representing owners and workmen under the wage agreement show that the owners are suffering heavy losses. The miner's suggestion indicates the policy of despair and is an argument which the owners may equally apply to their own condition.

French Strike Is Averted

The threatened strike of coal miners in France has been averted. After a new parley in which tact and a spirit of co-operation on both sides was shown, the mine owners agreed that the two wage cuts, the first to take effect immediately and the second on April 1, would be 2fr. and 1fr.25c., instead of the two cuts of 2fr.50c. each. This means the total daily reduction for miners will be 3fr.25c., instead of 5fr. Family allowances remain unchanged. The men, who first heard of the 5fr. cut right in the midst of negotiations for higher wages, had declared they would pull a general mine strike. Today that danger is past.

The economic condition of mine labor is such that a 5fr. cut would have been a galling thing. The operators finally agreed they could manage to reduce the cost of coal to the consumer 6fr.50c. per ton without reducing wages so drastically. Various reductions in operating expenses are to be made principally by the introduction of labor-saving electrical machinery and by cutting dividends.

Export Clearances, Week Ended, Jan. 26, 1922

FROM HAMPTON ROADS:

	Tons
For Africa:	
Am. Bk. John C. Myer, for Georgetown, Br. Giana	1,348
For Atlantic Islands:	
Am. S.S. Amelia, for Port Antonio	858
Am. Schr. Robt. P. Murphy, for Santo Domingo	500
Am. S.S. Glendola, for Curacao	2,926
For Canada:	
Nor. S.S. Erholm, for St. Johns, N. B.	1,697
For Cuba:	
Am. S.S. Callabasas, for Manopla	492
Am. S.S. Montosa, for San Juan	4,023
Grk. S.S. Philaron, for Santiago	471

FROM PHILADELPHIA.

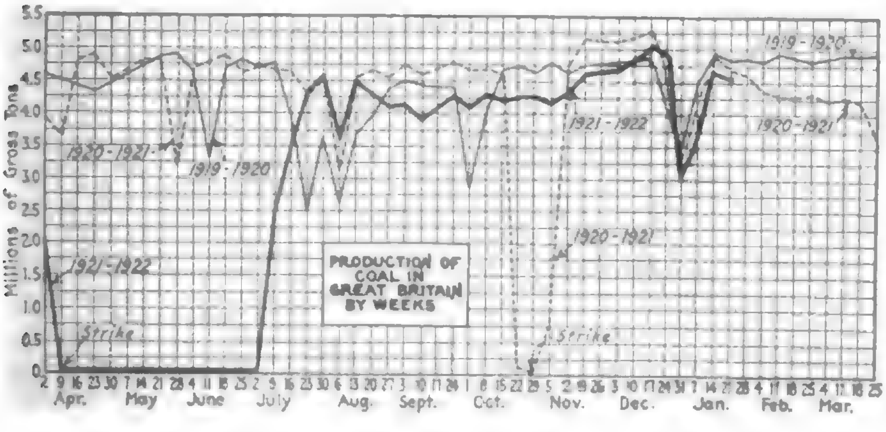
For Cuba:	
Br. S.S. South America, for Havana	...

Outlook Improves at Hampton Roads

Export volume was unchanged from previous weeks. A number of vessels last week took part coal cargoes for points in the West Indies and nearby. Conditions in South America, as a result of the business depression, were held responsible for a marked decrease in coal shipments to that section.

New England business during the week was fair, with indications of a steady revival of trade. Bunkers continued to hold their own, with a slight increase apparent during the latter part of January and first of February.

January dumpings were only 937,664 tons, as compared with 955,091 tons in December. The comparison with January, 1921, is not favorable, for during that month 1,425,209 tons passed over the piers.



However, the trend of the market last year was distinctly downward while at the present time it is stationary, if not rising. The threatened strike promises to expand the coal business, although no evidence of it is apparent at this time.

Prices are stable, but in certain specific instances under-the-market figures have been freely offered, governed by the fluctuating supplies on hand.

Pier and Bunker Prices, Gross Tons

Foreign Bunker Quotations by Cable to Coal Age

PIERS

	Jan. 28	Feb. 4†
Pool 9 New York	$5.45@$5.65	**$5.60@$5.80**
Pool 10, New York	5.15@ 5.30	**5.25@ 5.50**
Pool 9, Philadelphia	5.50	**5.50@ 5.70**
Pool 10, Philadelphia	5.10@ 5.30	**5.15@ 5.35**
Pool 71, Philadelphia	5.50@ 5.60	**5.65@ 5.80**
Pool 1, Hamp. Rds	4.65@ 4.80	*4.65@ 4.75*
Pools 5-6-7 Hamp. Rds	4.25@ 4.40	*4.30*
Pool 2, Hamp. Rds	4.50	*4.45*

BUNKERS

	Jan. 28	Feb. 4†
Pool 9, New York	5.80@ 5.95	**5.95@ 6.15**
Pool 10, New York	5.45@ 5.60	**5.60@ 5.85**
Pool 9, Philadelphia	5.60@ 5.85	**5.75@ 6.00**
Pool 10, Philadelphia	5.40@ 5.50	**5.55@ 5.65**
Pool 1, Hamp. Rds	4.80@ 4.90	*4.75*
Pool 2, Hamp. Rds	4.65	*4.60*
Welsh, Gibraltar	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Marseilles	120 fr. f.o.b.	120 fr. f.o.b.
Welsh, Genoa	40s. t.i.b.	40s. t.i.b.
Welsh, Messina	....	37s. t.i.b.
Welsh, Algiers	35s. f.o.b.	35s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	40s. f.a.s.	40s. f.a.s.
Welsh, Teneriffe	40s. f.a.s.	40s. f.a.s.
Welsh, Malta	40s. f.o.b.	40s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Port Said	49s. f.o.b.	49s. f.o.b.
Belgian, Antwerp	30s.	30s.
Alexandria	46s.	*45s.*
Bombay	38 rupees	38 rupees
Capetown	42s.	42s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Cardiff:	Jan. 28	Feb.†
Admiralty, Large	24s. 9d.	*24s. 6d. @ 25s.*
Steam, Smalls	18s.	**18s. @ 19s.**
Newcastle:		
Best Steams	25s.	*24s. @ 25s.*
Best Gas	21s. 6d.	**21s. 6d. @ 22s.**
Best Bunkers	21s.	**21s. @ 22s.**

† Advances over previous week shown in heavy type declines in italics.

Port of New York 1921 Exports Fall Short of 1920

Exports of coal and coke through the Port of New York last year fell considerably short of those during the previous year. There were 131,875 tons of anthracite sent to foreign countries as compared with 209,527 tons in 1920, a decrease of 77,652 tons; 61,641 tons of bituminous as against 208,840 tons, a decrease of 147,199 tons and 6,884 tons of coke as compared with 32,355 tons in 1920, a decrease of 25,471 tons.

Of the bituminous shipped Canada is credited with receiving 2,294 tons; Newfoundland, 1,713; San Domingo, 974 tons; France, 25,868 tons; Egypt, 1,000 tons; Norway, 500 tons; Turkey, Europe, 4,500 tons; England, 147 tons and Italy, 6,188 tons.

Northern West Virginia Coal Operators' Association

The annual meeting of the association will be held in Fairmont, W. Va., on Tuesday, Feb. 14, 1922. George S. Brackett, secretary.

North Atlantic

Seek Low Prices For Pre-Strike Deliveries

Buyers Shaken Up By Union Activity And Industrial Program—Little Contracting Going On Now—Wage Question Up Feb. 10.

Consumers in the North Atlantic section are busily engaged in seeking price protection on deliveries prior to the strike. Better buying has been induced by union developments but a stronger manufacturing program is also taking a little extra tonnage. There is not much talk of contract making at this time. In fact, operators are inclined to keep their commitments down to a strictly current basis.

The Central Pennsylvania Coal Association will meet about Feb. 10 to consider the wage question. Conditions in the unionized operations are unchanged and the low cost mines continue to secure the majority of the business offered.

NEW YORK

While there is a little more firmness in the market and spot quotations indicate a trifle more strength, demand has not increased much. The recent snow storm caused some congestion and has resulted in a shortage of the better grades of coal at the New York docks. However, toward the end of the week there were about 1,400 cars on hand. practically the same number as at the corresponding time of the week previous.

Buyers have not yet shown any disposition to place orders but are busily engaged in many inquiries. Talk of contract making has practically ended for the time being.

Some local houses report better business and February is expected to show greater improvement as the expected strike is too near at hand to keep buyers out of the market for any length of time.

Call for grades of Pool 9 is said to be somewhat stronger in some local houses. A slight improvement is reported in the bunker business.

BALTIMORE

The export situation continues most unsatisfactory. Including two shipments to Porto Rico, two to Egypt and one to Argentina, the total January movement was 19,488 tons cargo and 800 tons bunker. This was probably the poorest month's showing since before the war. Industrial demand continues fair, however.

Steam coals are 15c.@25c. higher at the mines per net ton than they were two or three weeks ago. Gas coals after a brief spurt are again on a remarkably low basis, and the best Pennsylvania lump has been offering in this market in the past few days as low as $2.15@$2.25 a net ton f.o.b. mines. West Virginia gas is weaker still. Run of mine has been offering around $1.40, while both slack and three-quarter are ranging $1.40@$1.50 a net ton f.o.b. mines.

CENTRAL PENNSYLVANIA

The executive board of the Central Coal Association met last week to consider the wage question. Operators contend that they can no longer mine and sell coal in competition with the other big fields that have decreed a reduction.

The entire situation was discussed but no action was taken affecting the central Pennsylvania field and another meeting will be held on about Feb. 10. It is probable that a meeting of all the members of the association will be held at that time.

Production is keeping pace with the first two weeks of the month of January, the unsettled conditions tending to stimulate buying owing to the possibility of a strike after March 31.

PHILADELPHIA

The bituminous market is better, but not busy. There has been heavier spot buying, although prices have advanced only slightly. There is, however, an unlimited supply of coal to be had at prices as low as any quoted in the last three months.

There has also been an increase in consumption due to the weather, and some lines of business are buying again. The best buyers are certain branches of the iron trade, most of whom while running lightly for the past six months, have cut heavily into accumulated stocks, and are now replacing some of it.

Inquiries from the consumer have doubled, and buyers are asking about contract prices, though few, if any, producers will give a definite quotation. It looks as if discussion of contracts will be postponed until April. Customers of long standing are assured that they will receive, in the event of mine trouble, preferential treatment.

FAIRMONT

Only a limited number of mines are in operation. Some concerns report an increasing number of inquiries but little additional business and about the only companies able to secure any spot orders are those having non-union mines and where the cost is low.

Even contract shipments are limited. Commercial business is extremely scarce and about all that keeps mines in operation anywhere is railroad fuel.

UPPER POTOMAC

Conditions are unimproved. Until there is a wage adjustment additional business will be unobtainable. Some companies have offered their employees work at a reduced scale but such offers recently made have been rejected. There are some railroad fuel contracts to be filled but where companies are without good sized contracts they are not operating. Prices are showing a softening tendency.

Anthracite

Production Rises but Retail Trade Wavers

Steam Coals Hard to Get — Much Idle Time At Mines In Spite of Independent Activity — Yards Reorder Only for Replenishment.

Production has increased with the cold spell. The retail business is sporadic depending on the weather. Steam coals are still scarce. Independent operations are heavier but there is still much idle time.

Retailers are reordering for replenishment only and not for reserves. At the present rate of consumption there need be no increase in production to meet all requirements through the balance of the coal year. Both retailers and householders are hopeful that costs will be lower after April 1 and are confining their purchases to the barest needs in the meantime.

NEW YORK

A growing demand is reflected in reports from the mining fields that more operations are on a full-time basis and that numerous smaller mines that have been idle because of the slump have resumed operations. Locally, retail dealers report considerable increased business. There are some consumers, however, who intend to withhold orders until after the new wage agreement between the operators and workers is entered into, believing there will be a wage reduction as well as a cut in freight rates.

Retail yards are well filled, and their owners are not willing to take any more coal than they believe they really need. Complaint of poor collections is frequently heard.

All steam coals are active. Buckwheat No. 1 is tighter but has not yet reached the point where there is any difficulty to obtain it. In some instances, the better grades of independent rice are being quoted above the company circular. Barley is growing scarcer.

BUFFALO

Despite colder weather the anthracite trade did not come up to former standards in January. Some say that, as the early buying did not provide for a full winter's supply the later buying will need to be heavy, but all predictions have come to nothing so far. The consumer has somehow managed to get along with a very light supply and he bids fair to go on in the same way.

Reports from the mining districts are discouraging. A dealer in independent anthracite says he has been offered some already on cars, at prices below circular, in order to save it from demurrage, but he can find no market for it.

PHILADELPHIA

The big snow early in the week gave the retailers plenty of business, but deliveries were difficult because of drifts. Ordering fell off rapidly at the end of the week with warm weather.

The retailer continues to order sparingly, even of the most wanted sizes, stove and nut. Pea coal is in better demand. Retail prices are firmer, but only because of the storm.

The outlook for good business during the present month is promising. Buyers who bought only part of their winter supply are coming into the market steadily now.

The steam situation strengthens considerably, and the change is shown best by the independents, who are getting better prices now for all sizes, some even claiming full company circular, although it is still a fact that fair shipments of all sizes can still be had off-price, particularly rice. The demand for barley increases and most independents are able to command $1.25 for their output. However, should the strike agitation fall they figure that following April 1 all steam sizes will be a drug on the market, with most of the manufacturing plants well stocked.

ANTHRACITE FIELDS

Although a general cold spell has been felt all over the eastern part of the United States it has not to any large extent affected the demand. Most of the companies are operating on part time and the work is so divided that at all of the collieries of a company the men will have equal opportunity to work.

The Jermyn Coal Co. which has been shut down for a number of months has resumed work. The men went back at their old rates of pay. This is the company that tried to get their men to accept lower wages.

There has been some stiffening of independent prices due to the cold spell.

BOSTON

Domestic sizes are in somewhat better demand as a result of the recent cold weather. Retail business slumped promptly, however, when the cold spell was over, but there is beginning to be enough concern over possible labor trouble to induce a little more buying. All sizes are in plentiful supply and for the present no extra demand is looked for.

CHICAGO

There is no great activity in the anthracite market. Prices are holding reasonably firm, with the demand fairly good. Anthracite, however, is receiving a great deal of competition from smokeless West Virginia coal, principally on account of the vast difference in price.

BALTIMORE

Ater ten days or so of real activity due to the heavy snowstorm a let-down in buying has come in the trade. Deliveries were difficult and expensive. Snow drifted four feet deep in places and lay 26 inches deep on the level. The present winter is now expected to prove one of the lowest consumption periods in the history of the trade.

New England

Buying Is Moderate; Railroads Stock Some

This Improves All-Rail Movement But Reserves Are So Big That Nobody Worries About Impending Strike—Prices Are Easy.

New England markets are not taking much additional tonnage. Moderate buying prevails, although the ail-rail receipts are slightly improved due to a little stocking by railroads and utilities. The present sluggishness in manufacturing circles, coupled with the fact that reserves are good precludes much buying in the face of the threatened strike. The buyer is also aware of the fact that the water-borne coals will be available at that time, barring participation by the rail unions in the miners' controversy.

Prices are easy. Marine freights have stiffened because of the congestion caused by recent severe weather along the coast.

Inquiry for steam grades has dropped off. The market is again as quiet as early in January and there is a disposition among buyers to await developments. A week ago there were a number of inquiries in the market, but only a relatively few purchases resulted from these.

At Hampton Roads there is practically no change in quotations. There is an ample supply on hand for what boats arrive and apparently there is no difficulty securing spot coal on short notice. On-car quotations for Inland delivery at points like Boston and Providence are maintained on about the same level as the latter part of January.

Competitive bids for supplying from 8,000 to 15,000 tons to Massachusetts Insane Hospitals showed a range of $6.15@$6.35 per gross ton, on cars Boston and Providence, ash and B.t.u. being submitted from 5 per cent and 14,600 up. All-rail quotations on the same business varied from $2.25@$3.50 per gross ton at mines, the ash running from 5 to 7 per cent and the B.t.u. from 14,500 to 14,850.

Marine freights, Hampton Roads to Boston, have now risen to about $1.25 on vessels and barges of 2,500 tons upward, while smaller craft have been quoted recently as high as $1.50. This is a very material advance over freights that were quoted a fortnight ago and is due partly to strike talk but very largely to a temporary shortage on spot bottoms. For seven or eight days because of adverse weather, boats were unable to sail from Hampton Roads and the result is an abnormally large fleet now on the way here with more or less demurrage in prospect. When some of these boats start out light from here looking for charters, it is expected rates will recede somewhat.

The demand for Pennsylvania grades continues very light, although movement on contract has somewhat improved. The railroads are taking supplies in larger quotas and these requirements together with gas companies account for better receipts. Prices remain unchanged and are shown in the Weekly Review.

Doubtless moderate buying will continue, particularly on smokeless coals, and to that extent the market this month will average better than during January. Industries are really in no better shape, however, and consumers are taking coal only to be safe on supply during the spring months. Reserves are still large and the threatened textile strike is likely to ease off purchases the next few days.

Coke

CONNELLSVILLE

The coke appears a shade softer, but probably only because additional evidence of the condition has chanced to crop out. The chief news of the week is that two contracts for furnace coke for shipment over February, aggregating about $16,000 tons, have gone at less than $3. The spot market, quotable lately at $2.75, is still at that figure, though possibly this could be shaded 5c. or 10c.

Operators are turning their attention still more to coal as a broader demand is expected on account of the suspension at the union mines April 1. One large operator would not consider furnace coke sales even at much above the present market and is unwilling to increase foundry coke business. Another operator gave up two customers, resulting in the fresh sales reported above, preferring to use his mining capacity this month against sales of coal.

The *Courier* reports production in the week ended Jan. 28, at 56,790 tons by the furnace ovens and 33,560 tons by the merchant ovens, a total of 90,350 tons, an increase of 3,800 tons.

UNIONTOWN

The impending strike in the union coal fields continues to overshadow any development in the Connellsville field and it is now evident that the strike talk has commenced to have a definite relation to market conditions. Prices, however, are unchanged because those consumers, who are preparing for the future, are seeking to buy for future delivery, while operators are declining to quote prices ahead.

Tonnage of any grade of coal handled here can be obtained at nominal prices but it does not have a great demand. Isolated sales are reported at $1.30@$1.40 for steam coal and byproduct $1.60@$1.80.

BUFFALO

Jobbers report few inquiries for any grades of coke except domestic, which is moving moderately. The furnaces appear to be fully supplied for some time. Quotations are: $4.15 for 72-hr. Connellsville foundry, $3.15 for 48-hr. furnace and $2.75 for stock, with chestnut for house use $3.75.

Eastern Inland

Buyers Show No Haste But Now Appear Uneasy

Consumers Begin To Measure Reserve Piles Against a Possible Strike Shortage—The Check-Off Is Main Issue in Union Fields.

Buyers are rather leisurely in making overtures for much additional tonnage. There is, however, a growing undercurrent of uneasiness about safeguarding reserves for the period of expected trouble with the union mines. The lagging start in stocking is caused by the sluggish industrial situation which is only improving very slowly. Railroads and public utilities are the only ones so far to take definite steps toward amplifying their reserves.

The slight increase in business is going largely to the non-union fields. Pittsburgh producers have posted their new wage scale. The elimination of the check-off appears to be the main issue, as the men have made relatively little complaint about the prospective reduction in rates.

CLEVELAND

Important inquiries for storage coal are coming in and prices for steam grades are beginning to stiffen as the probable coal strike of April 1 draws nearer. Buyers are biding their time, feeling that any strike that may occur will be short. Coal operators are not inclined to discourage that attitude just now. In fact little effort is being made by some sellers to obtain orders at present prices on the strike argument.

A number of operators have withdrawn from the market until Feb. 15. With the market rising they are keeping their orders for delivery down to four or five days ahead. Losses have been so serious in recent months, that advances expected to come soon will offer the only opportunity of recouping.

All buyers are not holding off. Inquiries for from 2,000 to 5,000 tons for delivery by March 10 are appearing. Even so, buyers are shopping around and looking for the best prices to place their storage coal orders. The lack of snap to the industrial situation is another factor contributing to the rather lagging start in the buying movement. Operators fully expect that when the buying does start it will come with a rush. More coal is being mined and shipped than one month ago. Slack is quoted at $1.60@$1.75. Mine run is quoted up to $2 and ¾-in. lump at $2.10@$2.15.

PITTSBURGH

There is considerably more inquiry than a week ago, but actual buying is scarcely any heavier. The inquiry is chiefly to the adjacent non-union fields. Transactions in Pittsburgh district coal continue very light. Prices quoted are the same as for a long time past and represent no more than cost, with the present U. M. W. scale. Slack, which goes as a byproduct at whatever it will bring, is a shade easier for gas, steam slack being unchanged for several weeks.

While the general if not the universal opinion is that there will be a mining suspension April 1 at the union mines, buyers seem to be in no hurry to stock, and apparently feel that there is plenty of time left. Even the non-union districts are not working full at present, so that they could take on additional business during the suspension.

The common opinion is that the wage scale offered by the operators, and which is posted at mines as a direct communication to employees, is the limit the operators will pay, but it is felt at the same time that the rates would probably not prove especially objectionable to the men. The chief point at issue is the check-off.

Connellsville mine run steam coal is freely offered at $1.50 and has sold at considerably less in a few cases. The best Connellsville gas is bringing as high as $2. We quote the Pittsburgh district market unchanged except for a decline of 10c. in gas slack to $1.60@$1.70.

COLUMBUS

There is a better demand for steam sizes as manufacturing is going forward more actively. Public utilities are buying fairly well and some business from railroads is also reported. Prices have not advanced to any extent, except in the case of Hocking screenings.

Retail prices are steady at former levels, but demand has eased up. There is little demand for domestic coke.

Production is increasing under the influence of better buying. But the non-union fields of West Virginia and Kentucky are profiting more than Ohio fields. Operations in the Hocking Valley have been about 23 per cent while Pomeroy Bend, Cambridge and Crooksville are not producing any larger percentage.

A suspension on April 1 appears to be more certain than ever. As a result, a better buying movement, both for steam and domestic grades, is expected the latter part of February and early in March.

EASTERN OHIO

Production during the week ended Jan. 28 was 319,000 tons, a decrease of 7,000 tons under the output of the preceding week. Association mines increased operations, working about 40 per cent of full time and producing around 50 per cent of capacity.

Steam users as yet fail to respond to the warning signals of a strike. Increasing discussion anent differences between operators and the unions, however, is giving rise to some concern, and inquiries are more active.

The business trend has improved to such an extent that railroads are experiencing increased traffic. The prediction is made that once the demand for reserve fuel gains a little momentum, a car shortage will develop within a short time. This was demonstrated last October, and "bad order" cars have not received much attention during recent months.

While traffic is showing improvement, this has not yet been reflected to any appreciable degree in the current demands for railroad fuel but it is conservatively estimated that the roads are taking something over 40 per cent of the output at the present rate of production.

A survey of the general situation at this time resolves itself into the conclusion that the coal mining business is simply "marking time" awaiting developments. Spot prices on various grades show little change except that slack has recovered from its recent sinking spell, moving from $1.50 up to $1.60@$1.65.

DETROIT

Consumers of steam coal are not displaying the interest in the market that might be expected, in view of the possibility of a suspension of mining operations in the union districts about April 1. Buying is generally in small amounts and irregular.

Some buyers are counting on being able to provide for their requirements from the output of the unorganized mining districts, in the event of a strike. The low consumption basis seems to lend support to the theory that enough coal will be obtainable from non-union fields to satisfy requirements.

Four-inch West Virginia lump is quoted $2.60@$2.75, two-inch lump, $2.25, egg, $2, mine run, $1.65, nut and slack, $1.25. Three-inch lump from Ohio is $3, 1½-in. lump, $2.75, egg, $2.25, mine run, $1.90, nut and slack, $1.60. Pittsburgh No. 8 1½-in. is $2.35, three-quarter lump, $2.25, mine run, $2, nut and slack, $1.65. Smokeless lump and egg is $3@$3.25, mine run, $2.15, nut and slack, $1.25.

BUFFALO

Not many shippers report any improvement in demand, and so much coal is in sight and so many mines are ready to start up that prices probably will not tumble when buying starts.

A better market is likely to free any amount of coal that does not now come here. Then there are mines running everywhere that do not figure on a profit. If the men can be provided with enough to live on and the mines are kept in good running order it is all that can be expected.

The able jobber, who has the confidence of both operator and consumer, is doing some business at a profit. All other members of the trade are making little headway.

Quotations remain unsteady at $2.75 for Youghiogheny gas lump, $2.50 for Pittsburgh and No. 8 lump, $2.25 for Allegheny Valley and other mine run and $1.50@$1.75 for slack, adding $2.36 to Allegheny Valley and $2.51 to other coals for freight.

NORTHERN PANHANDLE

Railroad fuel continues to constitute the bulk of the output, which amounts to approximately 50,000 tons a week. Spot buying is almost at a standstill except for a few lump orders. In general, however, retailers seem to be well stocked. Companies producing nothing but commercial coal are working only a day or so a week. With the demand so insignificant, prices are barely holding.

Cincinnati Gateway

Backwash from North Hits Cincinnati Market

Public Utilities and Retail Trade Both Stimulate Production — Credits Are Made So Cautiously That Movement Is Slowed.

Heavily sold Northern and Western markets have created a backwash of smokeless coals at the Cincinnati Gateway which has softened that market. Public utility buying has stimulated the movement of steam bituminous while a more active retail distribution has aided domestic production. Credits are being made cautiously and this tends to restrict the movement.

There is a growing tendency among the men to take a wage cut, but this is being vigorously opposed by union officials.

CINCINNATI

A softening market for smokeless coals has followed the heavy movement made recently. As a result run of mine dropped to around $1.75. Lump and egg still hold at $3. Nut, however, followed the run of mine in its decline and screenings are weaker.

The calm in steam and domestic bituminous business has not affected prices much. There has been quite a noticeable entry of public utilities into the market and this has stiffened. Kentucky operators are still offering their slack at 25c. to 50c. below the market set by West Virginia, though it does not seem to speed up orders to any great degree.

Collections have been getting slower and slower and are bothering a great number of the firms. Some are inclined to the belief that the failure of response to urgings indicates that the worst of the pinch of hard times is on.

Retail business has been exceptionally good with the local firms, the recent cold spell calling for heavy replenishments and the increase in the gas rates forcing a number of new orders where the equipment allowed the use of coal. Smokeless prices are: lump $8; run of mine $7; slack $5.25. Bituminous lump is $6.50, run of mine $5.25, and slack $4@$4.75.

HIGH-VOLATILE FIELDS

KANAWHA

Owing to high mining costs, it was not possible for this region to make any headway in increasing production and consequently the output remained at about 7,500 tons a day, comparatively few companies operating. There is a disposition on the part of some miners to accept lower wages, but officials of the union have set their hand against any cut. About all that remains are a few contract orders not sufficient to warrant operations more than a day or so a week. With the spot demand so slim, prices are low.

LOGAN AND THACKER

Logan production is still hovering around 40,000 tons a day, much of it being on a contract basis. Some additional business is coming into the district by virtue of the talk of a general strike. A few spot orders are being placed for prepared but even this business is not in as large a volume as the cold weather would warrant. There is no briskness in steam buying.

Mines in the Williamson field are producing about 40 per cent of capacity. There is comparatively little spot buying, except for an occasional order for lump. The greater portion of the coal produced is either for railroads or is moving to Western points on contract. Prices show no signs of advancing.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

As idleness had been most pronounced in the New River field for a time, the improvement in production has been more marked than in any other smokeless field. With an increase in production, however, there had been a softening of prices. There is a larger movement to Tidewater, for bunkerage and coastwise markets. Much of the prepared coal is moving to Western markets.

Tug River production is now about 60 per cent of capacity, the increase being traceable to a somewhat better Tidewater demand. Much of the prepared coal is going to Western markets. In anticipation of a stronger demand, improvements are under way at a good many plants.

POCAHONTAS AND TUG RIVER

Pocahontas production is climbing slowly upward, having now reached more than 300,000 tons a week. More coal is moving to Eastern markets, however, and particularly to Tidewater. Some of the tonnage is also for by-product purposes. Western shipments are large. There is a little more spot buying but as so much more smokeless is going into the market prices have been a little weaker.

Tug River production is proportionately large, ranging above 90,000 tons a week. There is a little more activity in the spot market. The bulk of the product is moving Westward to by-product plants and steel mills, although there is a small tonnage being shipped for bunkerage purposes.

SOUTHEASTERN KENTUCKY

The Bell-Harlan fields have doubled their coal production recently. Unofficial L. & N. figures show that there are now between 600 and 700 cars going out daily. This indicates a production rate which is 70 per cent of maximum.

Demand for all grades is better, due to cold weather and stocking for a strike. Coal men here expect a slow but sure industrial revival this spring. Plenty of coal is now available at low prices. Observers feel, however, that prices will not decline any further. They now are: Block, $2.75@$3; egg, $2@$2.25 and slack, $1.15@$1.25.

NORTHEASTERN KENTUCKY

Production is on an upward trend, having reached over 42 per cent of potential capacity. The increase is attributed in part to fear of a strike and also to a slightly better demand for lump coal. The demand for screenings is not quite so strong nor are prices so firm. As a matter of fact, there is little activity in the buying of steam coals.

West

KANSAS CITY

Warm weather hit the retailers last week. Domestic deliveries slumped, but demand on the operators continues fairly strong. Steam plants want to store nut coal and demand for that grade exceeds the production. There is a big break in slack and prices are erratic.

The delivered price on Illinois slack is less than on Kansas coals which is running up the number of "no bills." On the other hand, Illinois egg and lump has advanced while there is no change in the Kansas price for domestic grades.

If there is any one thing more than another that needs stabilizing, not only for the benefit of the producer but consumer as well, it is the coal business. The banker criticizes the operator when he sells his coal at less than cost for he is therefore unable to take up his paper and the public condemns him in no uncertain terms when he takes advantage of the situation to recover his losses.

SALT LAKE CITY

With the moderation of the weather the retail business is falling off. Stocks are low in the city.

The mines are more active than they have been for months. Many are of the opinion that a strike will come on April 1. Railroads operating in the mountain territory are storing coal on this account. The Rio Grande Western has 200,000 tons in its terminal yards in Colorado and 52,000 tons in Utah. The U. P. is also taking precautions. One coal company has already cut its wages 25 per cent without causing any trouble.

Operators have been able to dispose of more slack than for some time, but there is still a big surplus of this on hand, the demand being for the larger sizes.

DENVER

Although weather conditions were more like winter, production decreased at the close of January. Retail distribution is slow and uncertain.

Bituminous mine prices have dropped $1 per ton. Some operators had difficulty in meeting this cut of the Colorado Fuel & Iron Co. Rockvale bituminous lump, following a reduction in wages in the Canon City district, was reduced to $10.25, and nut to $9.75. Routt County bituminous lump is $10.75, the difference being in freight, while bituminous nut is $10.25. Lignite is retailing $6.50@$9.50.

Chicago and Midwest

Domestic Market Fair In Spite of Warmth

Premium on Coal in Transit—Moderate Buying in Steam Trade—Railroads Store Some—Many Purchasers Seek Non-Union Connections.

Warm weather has brought some cancellations but the domestic situation is still good in the Midwest. Coal in transit is even bringing a premium. The steam business has picked up as moderate reserve buying starts. Railroads are storing cheap coal whenever possible, but little business has been closed, considering the propinquity of April 1. Many steam buyers, however, are quietly casting about, in an attempt to make non-union connections.

The announcement of the Indiana operators advocating a sweeping reduction in wages makes the probability of a strike even more certain. Should John Lewis be able to join forces with the railroad brotherhood the consequences to the unprepared coal consumer would be serious.

For a few days last week the weather was mild. The coal market responded almost instantly, and a great many operators received telegrams calling for cancellations. However, the large tonnage booked by the operators during the last cold spell gave them a substantial surplus to work on.

The domestic market is strong, especially lump and egg sizes. In nearly every case these two sizes are bringing the full circular price. Large wholesalers have placed standing orders with some operators, calling for a certain number of cars per day, to be shipped on consignment to different distributing points. The mood of the retailer is simply this: he wants to place orders but only with the understanding that his order will be filled at once, consequently car numbers are at a premium.

Steam coals took a slight turn for the better, in spite of the increase in production. Some of the larger industries are buying very cautiously, and from four or five different sources, the idea being to accumulate a storage pile which will permit them to operate for approximately 60 days. The opinion appears to be if there is a strike at all it will be of from one month to six weeks' duration. Some coal men, however, feel that a strike will last considerably longer than six weeks. One large railroad has been quietly buying up cheap coal since the middle of December, and this is being stored at a division point in the West.

Illinois and Indiana operators are having no difficulty with their men, who are showing a willingness to work whenever the opportunity occurs. A new element, however, was put into the labor situation a few days ago, when the United Mine Workers appealed to the Railway Brotherhood with the suggestion of pooling their interests. Should anything be worked out along these lines it may bring great disaster to the country. In well-informed circles it is very largely doubted that there will be any co-operation between the miners and the railroad men.

CHICAGO

Indications point to a quick revival of the trade, as the increased activity of the market is being noticed by nearly everyone. Producers are receiving telegrams by the dozen, and telephone calls from wholesalers, demanding car numbers on orders already placed, or seeking to place orders for future shipment.

The United Mine Workers, from all present indications, intend to put up a strong fight, that wages cannot readily be reduced without a struggle. The situation is confronted with difficulties. There are those in the Chicago trade who claim that if there is a strike it will only be from a month to six weeks in duration. They base their opinion largely on the fact that the economic trend is toward lower wages, consequently lower production cost, and that the United Mine Workers will not be strong enough to withstand the overwhelming forces at work on the present economic situation of the country.

The labor leaders, however, have to go through a certain amount of strike talk and a lot of noise in order to retain their following; hence, all this talk about increased wages, etc. Contrasted with those who claim the shut-down will be of only a month's duration, are those who think that it will, perhaps, be the worst coal strike in the history of the country.

The weather softened last week, but this did not have much effect in the domestic market, as the previous cold snap created a demand so great that the mines of the Middle West have not had an opportunity to take care of it. Cold weather has again appeared and it is expected that the domestic market will show signs of greater strength.

A tendency on the part of the industrial buyer to stock coal has developed lately. Some companies in southern Illinois have reached a point where they are unable to take orders for more screenings. As the first of April draws nearer it seems likely that steam coal prices will be much in excess of those quoted today.

One of the large distributing companies, specializing in smokeless coal, issued a circular at $1.75 for mine run. This circular brought in considerable business. It is believed, however, that the same circular, quoting a price of $2, would have produced the same results, principally on account of the cold weather. West Virginia and Kentucky coals are in fair demand and agents are receiving many inquiries nowadays in regard to shipments to move forward after April 1. In short, the steam buyer is casting about to make a connection with a non-union mine.

SOUTHERN ILLINOIS

Carterville field is suffering a shortage of lump whereas last week it was in surplus while egg and nut were short.

Prices current are: Screenings $1.50 @$1.65 lump, egg and nut $4.05 to retailers, $3@$3.25 to the steam trade, and $2.75 to railroads. About half the mines are still idle. Only the railroads are storing.

Conditions in the Duquoin and Jackson fields are somewhat similar, except that working time is not so good. Several destitute cases among miners have been reported, especially where sickness prevails and the county authorities are being called upon to aid in the matter of food, clothing and fuel.

The Mt. Olive situation is fairly good because of an unusually good movement to the Northwest and Kansas City. Screenings are $1.50 and domestic sizes, $3@$3.50.

The Standard field which shipped lump heavily during the cold weather and piled up other sizes cannot now get cars until the no bills are shipped. Several mines have been idle on this account. Current prices are: Two-inch lump $2.25@$2.40; 6-in. lump, $2.50@$3; 3 x 6 in. domestic egg, $2.50@$2.75; steam nut and egg, $1.85@$2.10; mine run, $1.85 and screenings 85c.@$1.

ST. LOUIS

Weather conditions have made business good for the retailer. Demand still continues to show preference for the cheaper grades, slighting anthracite and smokeless. Coke has slowed up.

While the domestic coal demand locally has been good, it has slumped in the country. Steam locally is easy. The buyer is gradually getting a certain storage on hand without creating any excitement on the market, and screenings slumped off from $1 to 85c.

There is no country demand for steam, although some considerable steam coal is moving to Chicago and some to the Northwest, but these shipments are light in comparison with other years.

Retail prices are firm, as follows:

Carterville	$7.50@$7.75
Mt. Olive	6.25@$6.50
Standard	5.25@$5.50
West Virginia smokeless	12.25
Byproduct coke	10.50
Gashouse coke	9.75
Anthracite chestnut	16.00
Anthracite egg	15.50
Anthracite grate	15.50

INDIANAPOLIS

Owing to the colder weather the trade showed a shade more activity than usual. However, toward the end of the week the activity died out after orders were filled.

The T. H. I. & E. Traction Co. was in the market for 300 cars of Indiana coal. It is understood that a bid of $1.90 was offered and accepted on part of the tonnage. The coal is for storage purposes.

Coal buyers do not show much interest as a result of the impending strike. It was rather expected that strike news would cause a greater demand for storage coal.

WESTERN KENTUCKY

Western Kentucky is again operating only about two days a week. Retailers are again finding things slow. However, industrial demand is better and a few concerns are stocking because of the impending strike and because prices are not going down.

Operators of the field argue that prices are now as low as there is any possible chance of their going unless wages are reduced, as they are at rock bottom and some mines are down not because they cannot get business, but because they can't operate profitably.

LOUISVILLE

Demand for prepared sizes has slumped badly, and retailing is dull. One of the retail houses has cut the market again, quoting eastern Kentucky lump at $6, and other grades also 50c. lower than the general market.

Smaller production of lump stiffens screenings. Industrial demand is picking up slightly, and better inquiries are reported, as industries are getting busier, and some of them are stocking a little coal against a strike.

It is believed that present prices will continue for some weeks. There is little prospect of lower prices without more wage reductions, although there are some rumors concerning further reductions in eastern Kentucky. Western Kentucky in most instances is paying the full union scale, except where some private agreements have been made. There have been some reductions in wages reported from Tennessee also.

protection against a possible shortage.

A terrific storm is raging at present here and it is possible that a distinct demand for coal will be felt because of it. Consumers complain of the price of anthracite, but coal men here have partly offset this with statements showing the increased cost of production as well as in every step from mines to furnace. It is stated that there will be no further drop in hard coal, beside the one recorded recently, until April 1 at least.

MILWAUKEE

The coal movement continues fairly good, following the recent cold spell, which injected a little caution into consumers. Shipments to the interior are not what they should be, however. Some of the anthracite cargoes which have been held afloat were drawn upon during the past week, stocks in the sheds evidently having been reduced sufficiently to provide storage room. Prices are steadily maintained on both hard and soft coal and on coke.

Milwaukee consumers are not worrying about a strike. It is estimated that there is now on hand, on the docks and afloat, 418,800 tons of anthracite, and 1,107,400 tons of soft coal. Jobbers who handle rail coal exclusively say they are capable of meeting any emergency.

Testimony in the hearing before P. Carter, examiner for the Interstate Commerce Commission, in the complaint of the Milwaukee Association of Commerce, that freight rates on coal from Milwaukee to North Dakota, and between Duluth and other Northern points and North Dakota are prejudicial to the interests of Milwaukee, was completed on Jan. 31. The evidence will be placed before the commission for a decision.

Northwest

Coal at Head-of-Lakes Moves in Big Volume

Snappy Weather Causes Stir on Docks—Retailers Turn Stocks Quickly—Shaky Credits Stabilize—Steam Buyers Feel Safe

Northwestern markets have quickened with snappier temperatures. Domestic coal is moving off the Head-of-the-Lakes docks in heavier volume, but orders from retailers indicate that quick turnovers in stocks are the rule. The average retailer is keeping his stock pile at the minimum of current requirements. This helps the credit situation which has been shaky all season in the outlying districts.

Steam buyers are still lethargic, as industrial activity remains at low ebb. Consumers see the heavy dock supplies and are lulled to a feeling of immunity from the effects of the impending miners' strike.

MINNEAPOLIS

Neither the prophets of a severe winter nor those of an exceeding mild one have been able to claim a 100 per cent record so far this winter, for there has been some of both.

But so far as the general selling demand was concerned, it has been rather fitful much of the time. When the weather was severe, there was a rush of orders—most of which would have come in a few days later on, had mild weather prevailed. In either case, the buyers waited until the last moment possible before buying. Severe weather brought their needs to a head earlier.

On the other hand, the big thing in the view of the coal wholesalers and retailers of the Northwest is the tonnage for the season. Insofar as that is increased, the trade will be benefited, whether the increase comes in a steady gain or in sudden expansions. The former method is easier to handle. But it is the total tonnage which is going to count in the season's record. If enough of an increase is developed, there will be a lesser amount on hand on which to work against the spring's conditions. Of course the strike is a foregone conclusion, but it is far from certain that it will necessarily mean any great effort on the part of buyers to get under cover. With conditions presented to them quite as serious as heretofore, they have shown a serene indifference whether they bought or not. Nor is there the slightest indication that they will be alarmed when the strike sets in. For spring will be in sight then, and the general sentiment is that "they should worry" over the outcome.

Despite the weather of January, and its possible counterparts in February, coal buying is reluctant and confined to narrow volumes. Retailers are staying close to shore, in handling their needs. Steam buyers cannot be persuaded to stock beyond a very narrow total for the near-present, and other consumers make it a point of honor not to have much more than 15 minutes supply ahead, when a new delivery arrives. The past week being the end of the month, saw much delay in ordering, to get past the first, when there was the usual pickup.

General commercial conditions, which will do more for the coal market than the weather, remain rather dormant. Manufacturing is confined to small volume, and the fuel consumption is small. Once in a while a plant which has been down, starts up, but there still remain many which are running on part time, and under limited production.

The local coal market is weak and uncertain. The advance of 50c. made by one dock company on soft coal, has apparently had little effect upon the general situation, as others made no effort to follow the advance,—as much as they would like to do so, if they could establish it. A retail advertisement appeared lately quoting Franklin County nut, 2 x 3-in. at $10.25. West Virginia splint at $9.75 and steam coal at $8.75.

DULUTH

A possible advance in screenings and strong prices all around were the features of the Duluth-Superior harbor market last week. Some dealers are trying to get $4.25 for screenings. Retail collections are better throughout the Northwest, according to credit bureau statistics. Dispatch from the docks is the best in many years. A large portion of the coal going out is taken by the railroads themselves as

South

BIRMINGHAM

The acute dullness which set in prior to the holidays last year is still holding sway and the hoped-for improvement in demand with the new year has not developed. Basic conditions have undergone no change which would increase coal consumption and buying is still hand-to-mouth.

Expiration of contracts held by the Southern Ry. in the Illinois field has helped mines in this district holding contracts with that road, as allotments on such contracts in the way of deliveries have been increased. No improvement is noted in bunker demand.

The weather has been such as to create a steady but moderate domestic demand and most retailers will do well to clear their yards by April 1. This leaves a very restricted market for the producers and little new business is being booked at the mines.

Quotations are practically the same as reported a week ago.

VIRGINIA

Mines are producing at the rate of about 53 per cent of capacity or approximately 100,000 tons a week. The rate of production is higher on the C. C. & O., averaging almost 65 per cent. There is a little new business accruing as a result of the strike forecast but the greater part of the production is still moving on contract.

News Items From Field and Trade

ALABAMA

The Montevallo Mining Co., operating the mines at Aldrich, Shelby County, has filed a voluntary petition in bankruptcy in the Federal Court in Birmingham. Liabilities are given as $574,048.47 and assets $658,600. Referee E. H. Dryer named Val J. Nesbitt, a local attorney as receiver, who was instructed to operate the properties with interruption. Included in the liabilities is a bond issue of $368,000. W. S. Lovell is president of the company and head offices are located in Birmingham. The mine is worked by state convicts and was necessarily forced to operate regardless of market conditions. It is understood the company had been stock-piling coal for some time and has a large supply on hand. The product is a high-grade domestic fuel and has enjoyed a wide market in normal times throughout Southern territory.

COLORADO

In disposing of a number of industrial cases the Colorado Industrial Commission terminated jurisdiction in the wage dispute arising at the **Colorado Fuel & Iron Co.'s steel mills** at Pueblo, holding that the 10 per cent reduction effected by the company on Jan. 1, met with the approval of employees. Present wages paid at the Pueblo steel mills are still in excess of those paid by competing steel corporations in the East. The effect of the reduction was a resumption of work, which will require the coke plant to operate at capacity.

ILLINOIS

The annual meeting of the stockholders of the **Illinois Union Coal Co.**, was held at Carnville, recently. Directors elected were as follows: R. S. Levett, W. A. Herriman and F. W. Sharkae, all of New York and Alexander M. Crawford, of Carlinville. The company owns coal fields south and east of Carlinville, which at the present time are undeveloped.

The Sunnyside Mining Co. has been incorporated with capital of $100,000. The offices will be in Chicago. Incorporators are T. H. McElvain, J. W. McElvain and James W. McElvain.

Upwards of 6,000 acres of coal land lying between Oraville and eastward of Vergennes is being leased. This area has been drilled for the No. 1 and No. 2 seams of Big Muddy gas coal. It is understood that the upper seam No. 5 will be passed up for the lower and better coals. Top and bottom is bringing $150 per acre while the coal itself is averaging $50, where the surface is not taken. The proposed mine will be between the Illinois Central and Mobile & Ohio roads and will be owned by an operator in the present Big Muddy field.

INDIANA

Reassessment of coal properties in Vigo County are as follows: Eureka Block Coal Co., from $68,090 to $174,620; Ferguson Coal Co., from $80,010 to $146,080; Burnett Coal Co., from $56,850 to $71,290; Durand Coal Co., from $11,890 to $32,000; Clovelty Coal Co., from $300,000 to $230,000; Crawford Coal Co, from $8,990 to $21,220; Coal Bluff Mining Co., from $515,000 to $510,500; Jackson Hill Coal & Coke Co., from $97,320 to $202,930; Lower Vein Coal Co., from $88,330 to $181,000; Neutral Coal Producers Co., from $170 to $1,000; Miller Coal Co., from $33,450 to $29,000; Otter Creek Coal Co., from $25,590 to $66,390; Shirkie Coal Co., from $20,320 to $34,500; Sanford Mining Co., from $6,930 to $14,570; Riley Coal Co., from $1,850 to $5,000; Pine Ridge Mines Co., from $24,320 to $53,150; Miami Coal Co., from $270,890 to $717,945; Vigo Mining Co., from $6,140 to $50,070; Vigo Coal Products Co., from $14,500 to $16,290; Sugar Valley Coal Co., from $44,180 to $75,000; West Clinton Coal Co., from $7,800 to $2,830; Tighe Coal Co., from $18,220 to $5,000; Vermillion Coal Co., from $32,020 to $49,230; Willow Creek Coal Co., from $7,500 to $21,000; Deep Vein Coal Co., from $62,810 to $181,300; Black Hawk Mining Co., from $84,000 to $93,450; Bickett-Shirkie Coal Co., from $87,560 to $49,250; Fauvre Coal Co., from $73,690 to $79,890; Fontanet Coal Co., from $3,650 to $5,475; Glendale Coal Co., from $19,270 to $60,280; Grant Coal Mining Co., from $66,640 to $150,000; Indiana Coal & Gas Co., from $709,680 to $920,520.

KENTUCKY

D. S. Riddle, of the Riddle Coal Co., Chattanooga, was a recent visitor in Pineville.

Harry J. Hood, of the Loony Creek Coal Co., Detroit, was visiting the Harlan section recently.

The Sackett-Speed Interests, Louisville, which own the Byrne & Speed Coal Co., some large mining companies, cement mills, etc., have purchased additional coal properties in southeastern Kentucky, known as the Frost holdings of Harlan County, along with the Pucketts Creek R. R., and land of the Kentenia Corporation at the head of Catrons Creek, resulting in holdings of about 8,000 acres of coal land in that district.

The Canene Creek Coal Co., has closed its mine again after operating with a short force of non-union men. About a hundred miners went on strike when the company refused to reinstate two fired loaders. The company had been paying union wages, but was not under contract. The mine has been picketed, and the company has decided to stay down for a time, rather than have trouble.

MINNESOTA

A Twin City report announces that the **Northern Pacific Railway** will open up coal fields around Forsyth, Mont., after the exhaustion of its mines at Red Lodge, perhaps two or three years. The coal around Forsyth is an excellent quality, quite suitable for engine fuel. There is said to be a field around Billings, equal in size to the Pennsylvania fields. The company will furnish its Montana section from these mines, and its Washington divisions from the Washington mines. The Eastern sections will be served from the docks on Lake Superior.

MISSOURI

The Central Missouri Coal & Mining Co. is installing a steam shovel on the leases near Holt Summitt.

The Mosby Coal Co. has started the sinking of a shaft for the mine at Mosby. The company has 2,294 acres leased and it is capitalized at $150,000.

The Plattsburgh-Bibbard Coal Mining Co. reports that the engine house, work shop and tipple of the company's mine at Vibbard have been destroyed by fire. Rebuilding will not take place until a lower operating cost is in sight.

The Home Coal Co., Macon, has leased another mine to fifty of its miners who will operate on the co-operative plan. This mine is located on the Burlington R. R. and has been closed for over a month.

NEW YORK

The Coal Trade Club of New York is the name of a lunch club formed by representatives of thirty-four companies. It is the intention to hold luncheon on the first and third Wednesday of each month at the Whitehall Club. Addresses on coal, salesmanship, etc., will be delivered. The officers are: F. J. Herman, Pilling & Co., chairman; P. A. Paddock, Dexter & Carpenter, assistant chairman; Wesley Lieb, W. A. Marshall & Co., secretary; Joseph F. Lockwood, treasurer and chairman of committee on arrangements; Lloyd G. McCrum, W. H. Bradford & Co., chairman membership committee; and A. R. Davidson, Blaine Mining Co., chairman of speakers committee.

The Dominion Asbestos & Rubber Corporation, has moved the executive offices to 1780-82 Broadway. The company will retain the present store and shipping office at 67 Murray St.

The Electric Storage Battery Co. is consolidating its various New York offices. The Exide Battery branch has been moved to the New York branch office, 23-31 W. 42nd St., which will hereafter be the headquarters also of the export sales department.

The Phoenix Coal Company, Inc., New York, annouces the association of **William W. Davenport, Jr.**, in the general anthracite and bituminous coal business.

C. W. Watson, president of the Consolidation Coal Co., has been elected to the Board of Directors of the **Metropolitan Trust Co.**, of New York.

There has not been as large a response as expected to the letter sent out to the members of the old **Tidewater Coal Exchange** suggesting a plan to determine the proper basis of demurrage charges by employing a force of accountants to clear up the records. The letter was drafted by a committee consisting of W. A. Marshall, chairman; John Crichton, of the Johnstown Coal & Coke Co., and Harry J. Hughes, New York representative of E. Russell Norton.

OHIO

James A. Reilly, president of the Cincinnati Chamber of Commerce, has been reelected president of the Cincinnati Retail Coal Merchants' Association. **William Ulland** is its vice-president.

The Moore Fuel Co., Columbus, has been incorporated with a capital of $50,000 to deal in coal at wholesale and retail. Incorporators are J. W. Moore, Hugh Ridenour, Frank Gould, E. J. Durham and L. H. Fitzhugh.

The Main Island Creek Co., and the **Norfolk & Chesapeake Coal Co.**, recently took retailers and other handlers of their coals on separate tours of the West Virginia fields. Both started from Cincinnati.

The L. & W. Coal Co., Wellston, has been incorporated with a capital of $50,000 to mine and sell coal in the Jackson Field. Incorporators are George M. Leonard, Jr., Albert H Welsheimer, A. S. Leonard, William Beabont and Hazel Stroth.

The Midway Coal Co., has been chartered with a capital of $15,000 to mine and sell coal in the Pomeroy Bend District. Among the incorporators are A. Kasper and F. J. Leifheit.

The Corven Coal Co., Saltillo, has been incorporated with a capital of $15,000 to mine coal. Among the incorporators are D. N. Postlewaits and D. B. Corven.

Demand for a trial by jury of the involuntary bankruptcy proceedings brought against it by the **Tildesley Coal Co.**, Cincinnati, and others, was filed in United States District Court last week by the **Mohle Coal & Mining Co.**, Cincinnati. It also filed an answer to the creditors petition denying it is insolvent or that it committed an act of bankruptcy in connection with receivership proceedings filed in Common Pleas Court for Hamilton County July 7, 1921. As further defenses it is alleged that E. M. Poston and John B. Johnston, as receivers of the Interstate Coal & Dock Co., had no legal authority to join in the petition, and that as all of the petitioning creditors had notice of the receivership they are stopped from maintaining this action because the petition in bankruptcy was not filed more than four months ago.

United States District Attorney **James R. Clark** recently filed in United States District Court at Cincinnati a motion for the dismissal of the suit filed last September by the **Houston Coal Co., of West Virginia**, against the United States for recovery of $314,000 alleged to be due on coal requisitioned by the Navy department from April, 1920 to and including February, 1921. In his motion Attorney Clark contends the petition does not contain allegations showing that this court has jurisdiction and does not set forth a cause of action against the United States. In this suit the plaintiff sought to recover the difference between an allowance of the Government of $4 a ton and the market price ranging from $8 to $23 a ton, together with damages alleged to have been occasioned through the Government's action in requisitioning the coal.

OKLAHOMA

Claude Sturgeon has been appointed receiver for the **Samples Coal Mining Co.**, of McAlester, on plea of A. U. Thomas, trustee. The mine will be operated under the receiver. Attorneys for the plaintiff alleged that the company had failed to meet its payroll due Jan. 1, and that this condition had been brought about through inability of the company to market a large quantity of coal now loaded and standing on the company's tracks.

The Rock Island Coal Mining Co., of Hartshorne, is one of the few companies in Oklahoma that is producing coal in normal quantities. This company, with three mines near Hartshorne, is now turning out 2,700 tons of coal a day. The mines are being operated on full time, six days a week.

J. W. Kincaid, has resigned as president of the Miners National Bank, Henryetta, to become actively engaged in coal operations.

The Oklahoma School of Mines at Wilburton, announces that a special course of study for mine superintendents, pit bosses, gasmen and hoisting engineers will soon be offered. The instruction given will be placed within reach of every miner who desires to prepare to pass the state examination for these various positions. The course will include purely practical problems along mine ventilaton, mine timbering, mine gases, mine pumping and hoisting problems.

PENNSYLVANIA

John Ira Thomas has been appointed mine inspector of the thirteenth bituminous district and **Thomas F. Curry** and **John Whitehouse** were names as a board to examine all applicants for certificates of qualification as mine foremen, assistant mine foremen and mine bosses in the thirteenth district. All are residents of Cambria County.

The Pittsburgh Coal Co., is having plans prepared for a housing development for miners at its Library properties. The initial construction will comprise about sixty dwellings. Work will be commenced at an early date.

Joseph Blackburn, manager for W. H. Bradford & Co., of Morgantown, spent a day or so in Pittsburgh on business during the pre-holiday week.

Among recent appeals dismissed by the compensation board are as follow: Michael Earley, Dunmore, vs. **Pennsylvania Coal Co.**, Scranton. George W. Wenrich, Cressona, vs. **Buck Run Coal Co.**, Minersville. Julia Drugn, Harrisburg, vs. **Mather Collieries Co.** (Pickands, Mather & Company). This was an appeal by the defendant from an award of compensation by Referee Cummings, District No. 5, and the board in a brief opinion affirms the findings of fact and conclusions of law of the referee.

Benjamin Chaplin, of the Chaplin Collieries Co., was a visitor in the Pittsburgh market during the latter part of December.

The North America Coal Co., of Morgantown, was represented in the Pittsburgh market a short time ago by **C. D. Jenkins**, of Morgantown.

J. M. Humphrey, president of the Lehigh Valley Coal Co., met with an automobile accident recently, as a result of which he broke two bones in his ankle.

Machinery valued at $50,000 was destroyed by fire recently at the Avella Mine of the **Pittsburgh & Meadow Lands Coal Co.**, Avella, near Washington. Plans are under way for immediate replacement.

The most drastic manifestation thus far of the lack of demand for coal was given, when the **East Point Coal Co.**, operating the mines at Pond Creek, issued orders for an indefinite suspension. The fires were drawn, and every arrangement made for closing down the mines for a long period

J. L. Malcomson has been appointed manager of the Philadelphia office of **Dexter & Carpenter, Inc.**, effective Feb. 1.

The Roberts Coal Co., a concern organized a year ago by Johnstown business men, but which had been kept from the public, made itself known recently when a reorganization was effected. General offices are located in Johnstown while operations are between Garway and Mahaffey, Clearfield County. Officers elected at the recent meetings are: President, Dr. Louis Franko; secretary-treasurer, Francis C. Martin; general manager, I. B. Williams. The officers with the following form the board of directors: David Ott, P. L. Carpenter, Maurice Berney, James A. Graham, H. A. Slick and J. A. Dutra, the latter of La Jose.

The Consolidated Fuel Co. at Pittsburgh has contracted for local trade bins and refuse disposal machinery.

Robert Charlton, of South Brownsville, has resigned his position at Alicia No. 1 Mine of the Pittsburgh Steel Co., and accepted the position of salesman for the Grasselli Powder Co.

UTAH

In order to obtain information for use in the proper apportionment of Government lands into leasing units under the terms of the Leasing Act of 1920 a party of the United States Geological Survey, under the direction of E. M. Spieker, made a detailed study last summer of the thickness and distribution of the coal beds and the quality of the coal in the Wasatch Plateau, Utah. The area most thoroughly studied and mapped lies in the eastern part of the plateau, between Wildcat Canyon, in T. 13 S., R. 8 E., and the mouth of Huntington Canyon, in T. 17 S., R. 7 E. The Geological Survey has published a report of these investigations that will be furnished any one desiring it.

VIRGINIA

Ancillary receivers have been appointed for the **Northern Transportation Co.**, operators of tugs and barges in the New England coal trade. The company, according to proceedings filed against it by the Old Dominion Marine Ry. Co., and other creditors, is subject to claims of approximately $70,000 from ship repair plants.

It has been announced from the general offices of the **Flat Top Fuel Co.** that the Newport News and Norfolk branch offices have been combined and that C. J. Hollman has been appointed as manager of the Norfolk office. He was manager of the Newport News office and prior to going to Newport News was connected with the general office of the company at Bluefield. He has been named as the successor to H. B. Holland who has been transferred to New York where he becomes Eastern manager.

WASHINGTON, D. C.

Arguments have been heard in the Court of Claims on the demurrer of the government to the suit of the **Coronado Coal Co.**, which seeks to recover prices in addition to those allowed by the Navy under commandeering orders during the war.

F. M. Feiker, vice-president of the McGraw-Hill Publishing Co., who for the past eight months has been assisting Secretary of Commerce Herbert Hoover in the reorganization of the department, has resigned. Mr. Feiker has not, however, completely severed his relations with the secretary or the department. He has been appointed a special agent of the Bureau of Foreign and Domestic Commerce, to continue in a consulting capacity the work he has been rendering.

Engineer Commissioner Keller of the District of Columbia told the House Committee on Appropriations that there was no advantage in shipping coal by canal. He had investigated the matter several years ago when there was a rail transportation shortage and found that only 200,000 tons of coal could be handled on the barge canal in a season, which he classed as a "drop in the bucket." Representative Johnson, Kentucky, said the B. & O. had a controlling interest in the C. & O. canal to Washington and fixed the rates on coal to correspond with the rail rates.

The Department of Commerce has requested Congress to pay a claim of $271 to the **Consumers Coal Co.**, for damage to its wharf by collision of a light vessel at Brunswick, Ga., last October.

WEST VIRGINIA

W. A. Wilson, who has been associated with the interests of Colonel T. E. Houston in the Thacker field for a number of years, has become the general superintendent of these interests, effective Feb. 1.

J. B. Clifton, head of the Raleigh Smokeless Fuel Co., at Beckley, will spend the next few months in South America.

The Nelson Fuel Co. of Lewisburg has increased its capital stock, following action of its stockholders and authority granted by the Secretary of State, from $500,000 to $1,000,000. The authorized capital stock of the **William Dempster Coal Co.**, of Charleston, a comparatively new company, has also been increased from $50,000 to $150,000.

L. C. England, who has been acting as sales manager of the Fairmont Mining Machinery Co. has been appointed assistant general manager of the company. **Leonard Sergeant** is the new sales manager of the company. Although formerly connected with this concern as sales engineer, he had been for about a year associated with the Huntington Supply & Equipment Co., with headquarters at Beckley.

Several changes have been made in the personnel of the operating department of the Consolidation Coal Co. in the West Virginia district. **John O. Riggins** who has been superintendent of several of the company plants has been transferred to the department of tests. He has been succeeded as superintendent at Mines Nos. 26, 57 and 85 by **B. G. Ash**, who has been superintendent at Mines Nos. 21 and 91. **E. B. Courtney** has become the superintendent at Mines Nos. 21 and 91 succeeding Mr. Ash. Mr. Courtney was superintendent at Mine No. 32. He is succeeded at that post by **C. H. Higginbotham** who has heretofore been superintendent at Mines Nos. 51, 66 and 40.

Eugene H. Arnold, president of the Randolph Colliery Co. of Elkins, is spending some of the winter months at DeLand, Fla.

Governor E. F. Morgan has reappointed **R. M. Lambie**, as chief of the Department of mines for the four years ending Dec. 31, 1925. The present head of the West Virginia Mining Department was appointed by Governor Cornwell a few years ago when W. J. Heatherman resigned to become identified with the Cleveland Cliffs Iron Co. Mr. Lambie has had extensive experience in the New River and other fields.

What eventually promises to be the greatest coal operation in West Virginia, is being developed at Three Forks, a mining community near Lundale. Coal will be taken simultaneously from 52 openings in the same coal seam. Depression in the industry has retarded development of the operation, but the entire project is expected to be finished in two years. The operation is one of the newest sponsored by the **Lundale Coal Co.**, interests, of which George M. Jones, a well-known coal operator, is general manager and a large stockholder.

Harman Woodward has been appointed as Southern agent of the Pocahontas Coal Sales Co., and of the Glen Alum Fuel Co. Mr. Woodward will make his headquarters at Bluefield. For a time Mr. Woodward was in charge of the business of Weston Dodson & Co., at Bluefield and for fifteen years he has been associated with companies in the Pocahontas region.

WISCONSIN

James J. McGuigan of the Milwaukee Coke & Gas Co., left New York recently for Sumatra on a business mission.

Plans are completed for reorganization of the **Interstate Coal & Dock Co.**, which was bid in for $350,000 by C. H. Mead, secretary of the creditors' committee acting for the creditors of the company. The new company will have capitalization of about $3,000,000, with some of the largest producers in the United States numbered among its stockholders. The plans of the new company contemplate enlargement and improvement of the Green Bay dock with other improvements looking to the handling of a greater tonnage. Included among the stockholders of the new company are:

BRITISH COLUMBIA

OUTPUT FOR YEAR 1921

	1921	1920
Vancouver Island District		
Western Fuel Corporation of Canada	599,000	626,633
Canadian Collieries (D) Ltd.		
Comox	426,354	455,914
S. Wellington	82,700	90,309
Extension	209,876	196,405
Nanoose Collieries	48,500	32,500
Granby Cons. M., S. & P. Co.	266,817	201,589
Pacific Coast Coal Mines Ltd.	.....	94,904
Total	1,633,247	1,698,254
Crow's Nest Pass District		
Crow's Nest Pass Coal Co.		
Coal Creek	431,686	431,783
Michel	290,122	265,592
Corbin Coal & Coke Co.	74,773	151,014
Total	796,581	848,389
Nicola-Princeton District		
Middlesboro Collieries	73,319	87,602
Fleming Coal Co.	34,886	32,122
Coalmont Coal Co.	72,689	8,983
Princeton Coal Mining Co.	13,114	20,717
Telkwa Coal Co.	.....	1,400
Total	194,008	150,824
Total for the field	2,623,836	2,697,467

Traffic News

In the case before the I. C. C. involving **intra-state** rates on bituminous coal in Ohio, the **Public Utilities Commission of Ohio** and the **State of Ohio** contend that any advance in the rates on coal from and to points within Ohio in excess of 40 per cent will be discriminatory to Ohio and should not be allowed. The jurisdiction of the I. C. C. over these rates is also questioned.

In a brief in its case the **J. L. Mott Co.**, asks the commission to establish through rates on bituminous coal from B. & O. points to Trenton for Pennsylvania delivery the same as are in effect for Philadelphia and Reading delivery. The railroads reply in a brief that this would diminish the effective use of cars, impair distribution, slow down movement and operate to the disadvantage of the public. Attention is called to difficulties arising from a two-line haul as contrasted with a one-line haul.

The West Side Fuel Co., of Lansing, has complained against unreasonable and illegal demurrage charges on coal at Lansing, Mich.

The suspension of coal rates granted by the I. C. C. Dec. 6, lowering the rates on coal from Wyoming mines to points in Utah, thus enabling dealers in Wyoming coal to compete with the Utah dealers, was the subject of a hearing conducted in Salt Lake City, Feb. 6.

The I. C. C. has suspended until March 24 proposed reduced rates on coal to Kansas City, Mo.

The Lackawanna Steel Co., in a complaint alleges unreasonable rates on coal and coke from the Reynoldsville, Pittsburgh, Connellsville and related coal fields to Buffalo and vicinity.

The Zion Institutions and Industries, of Zion, Ill., have complained against unreasonable rates on bitumonous coal from mines on the Evansville, Suburban and Newburgh and Evansville and Ohio Valley railways to Zion, Ill.

Recent Patents

Safety Device for Mine Elevators. John S. Barnette, Jr., Broughton, Penn., 1,398,-216. Nov. 22, 1921. Filed March 16, 1920; serial No. 366,318.

Trail Coaler. Samuel L. Bouldin, Oswego, Kansas, 1,398,833. Nov. 29, 1921. Filed Oct. 16, 1920; serial No. 417,354.

Mine-Car Controlling Mechanism. George Foster, Bicknell, Ind., 1,398,896. Nov. 29, 1921. Filed Aug. 14, 1919; serial No. 317,491.

Drag-Scraping Apparatus. William E. Hale, Fort Washington, Penn., assignor to R. H. Beaumont Co., Philadelphia, Penn., 1,398,897. Nov. 29, 1921. Filed Feb. 11, 1920; serial No. 357,768.

Rock-Drill Sharpening Device. Joseph H. Hines, Auburn, Calif., 1,397,960. Nov. 22, 1921. Filed March 28, 1919; serial No. 285,808.

Adjustable Straightedge Plumb and Level. Philip T. Fagrie, Seattle, Wash., 1,398,183. Nov. 22, 1921. Filed April 29, 1919; serial No. 293,542.

Publications Received

Coal and Coke Mixtures as Water-Gas Generator Fuel, technical paper 284, by W. W. Odell, gas engineer, has been issued by the United States Bureau of Mines. Details are given of studies recently made at Davenport, Ia., in co-operation with the Illinois State Geological Survey and the Engineering Experiment Station of the University of Illinois, in which very satisfactory results were obtained with the use of coke and Illinois bituminous coal in the manufacture of water gas. Copies may be obtained by applying to the Bureau of Mines, Washington, D. C.

A book entitled **"The Shipping Board and Our Merchant Marine,"** is being distributed by The Mechanics & Metals National Bank of the City of New York. The booklet presents an analysis of the situation now existing in the United States, wherein the Shipping Board constitutes an important factor in the economic situation of the country.

The Miners' Safety and Health Almanac for 1922 has been issued by the United States Bureau of Mines, in co-operation with the United States Public Health Service. The almanac was compiled by R. C. Williams, passed assistant surgeon, U. S. Public Health Service. The almanac is freely illustrated and contains many articles by experts in safety, health and sanitation problems. Copies may be obtained from the Bureau of Mines, Washington, D. C.

Year Book of the National Association of Cost Accounts. Contains practical subjects of cost information. Non-members of the association can secure copies, price $3, by sending remittance to the association, 130 W. 42nd St., New York City.

Trade Catalogs

Pawling & Harnischfeger Co., of Milwaukee, Wis., distributed a novel piece of printed matter at the Chicago Good Roads Show, in the form of two disks with an eyelet in the center. By moving the upper disk in a circle the various booms that may be used with the Pawling and Harnischfeger 8 in 1 machine are shown.

Circlet 600 Volts "Snaf-Arc" Type A Safety Switches.—Circular No. 52. The Trumbull Electric Mfg. Co., Plainville, Conn. Pp. 10; 3½ x 6 in.; illustrated. This switch is the same as the regular 600 V Knife Switch except that it has a swinging moulded barrier which extinguishes the arc by preventing side flare and immediately cutting it in two.

Quigley Fuel Systems.—Catalog No. 12. Hardinge Co., 120 Broadway, New York City. Pp. 48; 8½ x 11 in.; illustrated. Describes methods of preparing, transporting and burning of pulverized fuels, with plant layouts and description of the Unit Milling Plant. This catalog will doubtless be useful to the engineer designing power plants or furnaces requiring considerable quantities of heat.

Chicago Pneumatic Dry Vacuum Pumps.—Chicago Pneumatic Tool Co., Chicago, Ill. Bulletin 710. Pp. 28; 6 x 9 in.; illustrated. Describes how through the elimination of inlet valves, as well as through the use of the Simplate discharge valve, clearance has been minimized.—Advertiser.

Hoists, Electric and Steam for Mine Service.—Pittsburgh Mining Machinery Co., Pittsburgh, Pa. H-101. Pp. 4; 8½ x 11 in.; illustrated. Describes factors entering into the problem of selecting correct hoist.

Association Activities

Monogahela Coal Association

The Monogahela Coal Association, composed of operators along the Monongahela Ry. and its connections in northern West Virginia, has been organized, for the purpose of bringing the members into closer touch with each other respecting problems peculiar to the field in which they operate. The members companies are already affiliated with the Northern West Virginia Coal Operators' Association, which embraces the entire Fairmont field.

The officers of the new association are as follows: W. E. Watson of Fairmont, president; B. M. Chaplin, vice-president; J. B. Hanford, treasurer, and Harry C. Owen, acting secretary. All of the officers except Mr. Watson reside in Morgantown. George S. Connell, general manager of the Pittsmont Coal Co., a Connellsville company, and A. Q. Davis of Uniontown, were Fayette County men elected on the board of directors.

Tug River Operators Association

Much opposition developed at the annual meeting of the association, held at Welch, to the bill proposing to establish a fuel yard at Washington, the sentiment being expressed that this might be a preliminary step toward bringing the coal industry into the realm of politics. Announcement was made after the meeting that "it was felt by a number present that this was a move on the part of some politicians that may result in the establishment of all sorts of bureaus for coal, merchandise and what not all over the country." Operators also gave consideration to the Ohio rate case and devised plans to fight the attempt to widen the differential on railroad rates on all coal going West.

The following executive committee was elected for the year: A. B. Rawn, of Huntington; A. F. Leckie, of Welch; J. T. Wilson, of Bluefield; H. E. Harman, of Tazewell, Va.; H. A. McCoy, of Twin Branch; George Wolfe, of Beckley; H. F. Warden, of Bluefield; L. Epperly, of Bluefield; C. H. Harman, of Tazewell. The following officers were elected by the executive committee: A. B. Rawn, president; A. F. Leckie, vice-president; C. C. Morfitt, secretary; J. T. Wilson, treasurer. A. B. Rawn and C. C. Morfitt were designated as the representatives of the district on the executive committee of the West Virginia Coal Association.

Northeast Kentucky Coal Association

The fourth annual meeting of the association was held at the Ventura Hotel at Ashland, Ky., Jan. 26, there being an unusually large attendance at the annual gathering. It was pointed out during the meeting that through association activity a through rate has been established to Newport News for export and trans-shipment beyond the capes. The association went on record as opposing a production tax on coal and urged all interested to do all within their power to defeat the enactment of this or any other such class legislation.

A resolution was carried unanimously providing that the following counties might be embraced in the association: Boyd, Greenup, Carter, Rowan, Elliott, Lawrence, Martin, Johnson, Morgan, Magoffin, Floyd, Pike, Knott and Letcher. The association went on record as approving the adoption of the American valuation plan in the tariff bill.

The following officers and members of the executive committee were elected: Charles W. Connor, Esco, president; E. R. Price, Consolidation Coal Co., Van Lear, vice-president; E. L. Dailey, Hellier, second vice-president; George B. Archer, Prestonberg, treasurer; C. J. Neekamp, Ashland, secretary. Executive committee: George D. Archer, Prestonburg; E. L. Bailey, Hellier; Chas. W. Connor, Esco; T. S. Haymond, Fleming; Henry Laviers, Paintsville; E. R. Price, Van Lear; F. E. Durham was elected as statistician.

Obituary

Herbert M. Tower for many years a coal merchant in New Haven, Conn., died at his home in that city recently.

Robert A. Powell, coal dealer of Henderson, Ky., died at Louisville recently, following an operation.

Charles T. Malcolmson, of Chicago, president of the Malcomson Briquet Engineering Co., died recently in the Grant Hospital, Chicago. He was widely known throughout the Western states in mining circles.

Clarence H. Jones, coal operator of Terre Haute, Ind., died recently in an Indianapolis hospital. Mr. Jones was 62 years old and had been in ill health for nearly a year. He was president of the Colora Coal Co. and also of the Lenora Coal Co., operating mines in Sullivan, Ind.

Coming Meetings

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

American Institute of Electrical Engineers will hold its midwinter convention in New York City, Feb. 15, 16 and 17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Institute of Mining and Metallurgical Engineers will meet on Feb. 20 to 23 in New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

Canadian Institute of Mining and Metallurgy will hold its annual meeting March 1, 2 and 3 at Ottawa, Canada. Secretary, G. C. Mackenzie, Drummond Building, Montreal, Quebec, Canada.

Southern Appalachian Coal Operators' Association will hold its next meeting Feb. 10, 1922, at Knoxville, Tenn. Secretary, J. E. McCoy, Knoxville, Tenn.

Pittsburgh Vein Operators' Association of Ohio will hold its annual meeting on Feb 13, 1922, at Cleveland, Ohio; D. F. Hurd, secretary.

Rocky Mountain Coal Mining Institute will hold its next meeting at the Albany Hotel, Denver, Col., on Feb. 20, 21 and 22. Secretary-Treasurer, F. W. Whiteside, Denver, Col.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E LESHER, *Editor*

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A Code for Trade Associations

NOTHING less than a victory for business is the acceptance by the Attorney General of the trade-association code drawn up by the Department of Commerce and set forth in the letter of Secretary Hoover, which, with Mr. Daugherty's reply, is published elsewhere in this issue of *Coal Age* (pages 297-99).

Trade associations have been in more or less of a dilemma for months. Their activities under active suspicion following the first news of the government's injunction against the hardwood lumber producers and the disclosures of the Lockwood committee in New York, they were far from relieved of doubt as to their status by the Supreme Court decision in the Hardwood case.

From the start Mr. Hoover has taken a strong position in favor of promoting this line of business activity, holding in general that trade associations for the collection of certain vital statistics of business are essential to the progress of commerce in the present complex condition of our industry. In a series of eleven questions, covering every practical application of trade association usefulness, Mr. Hoover has established a code of greatest value to business. The Attorney General was asked "May trade associations engage in any or all of the activities named without violating the law, provided the organization and the activity engaged in are not for the purpose of hiding or concealing some agreement, contract, etc., to actually restrain trade or otherwise violate the anti-trust laws?"

To which the Attorney General made reply that he could "now see nothing illegal" in the exercise of the activities, "*provided always* [the italics are his] that whatever is done is not used as a scheme or device to curtail production or enhance prices and does not have the effect of suppressing competition." This expression of view he holds is very tentative and "if in the actual practice of any of them it shall develop that competition is suppressed or prices materially enhanced" he will proceed under the anti-trust act.

This is in consonance with the theory that objection is to the use that has been made of the associations and not to the instrumentality itself. It is important to have a clear understanding of the principles set forth by the Department of Commerce to which tacit approval is given. It is fundamental that the information collected and compiled must be equally available to the public, the buyer, as well as to those contributing the facts. It is pointed out that in the past the associations giving out their data have been in the minority. This must be corrected.

The support given to the association idea by the government is founded on the theory of mutual interchange of information, not only between members of a single group but between groups. The coal men must promulgate their facts to the buyers of coal, and the buyers of coal tell their results for the guidance of the coal industry. We are now in position to amplify the trade bureaus and proceed ahead at full speed. We may be back where we were two years ago, but at least we have some assurance of non-interference.

Collective Marketing and Selling

IS THERE a suggestion for the coal man in the farmers' aid legislation known as the Co-operative Marketing bill, recently passed by Congress? This legislation authorizes farmers and other producers from the soil to act together in associations, co-operate or otherwise, in collectively processing, preparing for market, handling and marketing in interstate and foreign commerce the products of their farms. The Secretary of Agriculture is to be the sole judge as to when those acting under the authority of this act are acting in restraint of trade.

Of the basic industries, bituminous coal, next to agriculture, is the least organized, the most highly competitive, overdeveloped, overmanned and, on the average, uncertain of remunerative return. From such a position it is possible to move in two directions. One is that taken by large industries such as steel, automobiles and textiles. Consolidation into large, powerful units is the first step on this course—the trusts of a few years ago. By this process there is developed the financial strength to withstand the shocks of depression and poor business and the ability to utilize every device for cheapening production and distribution. But the very evil it would be sought to cure is the chief deterrent to such a program. The soft-coal industry is overdeveloped because it is so simple to expand the plant; no one has attempted a coal company embracing 25 or more per cent of the country's total because it is so easy to open new mines to replace those consolidated.

The alternative is that taken by the farmers. Lacking the inherent ability to combine ownership into large units, the farmers now have the undisputed right to agree, combine or what not, for collective selling and marketing. In other words, the anti-trust laws have been set aside for the farmer. The manner of the getting is plain enough—having a fall-ward looking Congress, very mindful of the farmer's interests, the action is taken. Not that the country is as yet disposed to put the anti-trust laws on the shelf. Nor do we feel that this legislation is something to be "viewed with alarm." On the contrary, we are hopeful that it will give some approximation of the relief its sponsors anticipate.

Perhaps as a result of this experiment a way will be found to promote useful combinations, and mayhap when the country finds no ill effects from combination in one basic industry it will be willing to permit the soft-coal producers to make a beginning, even though there be no coal "bloc" in Washington.

Anthracite Consumers' Platform

SHIPPERS have been organized for many years for the protection of their interests in freight-rate matters, but the ultimate consumer has had little more than passing say on such matters as affect the costs of transportation in what he buys. A somewhat novel trial is being made to unite the consumers of anthracite in a concerted effort to reduce the railroad freight rates to New York and other Eastern points and to force the improvement in the quality of that product that all consider desirable but that so far has not been effected by the producers.

The "Anthracite Coal Consumers' Association, Inc.," chartered under the laws of New York, is founded on the theory that "the consumer is the only person vitally interested in reducing the price of anthracite." Five paragraphs cover the program of this new association—reduction in freight rates by half; improvement in the quality of the product as shipped from the breakers; seasonal freight rates to further encourage summer buying and storage by consumers; promotion of economies in use by admixture of bituminous coal with anthracite, and dissemination of knowledge of how best to burn coal.

To such a program, thus broadly stated, no one can take serious exception. If after such investigation as must be had in such matters the Interstate Commerce Commission finds, as contended, that rates on anthracite are too high, the rates should and will be reduced, and literally millions of people will be benefited. If someone can show the hard-coal producers how to remove more of the bone and slate from their product without at the same time throwing away half of what they mine, they will do it. Anyone who has had the opportunity of inspecting the new and elaborate breakers in the hard-coal region will appreciate to what expense and pains the producers have already gone in preparing clean coal for their trade. The art of preparing hard coal has made great progress in the past twenty years, but it is only proper to say that in the opinion of many it has not kept pace with the decrease in quality of the coal as mined. That is to say, the clean, thick beds of anthracite have long since been exhausted and what is being mined today is largely the thinner and dirtier beds passed up as unprofitable of extraction in the earlier days. We have no doubt that if the "Anthracite Coal Consumers' Association" can show the producer how better to prepare his coal, its suggestions will be welcomed. It is a mistake to assume that dirty coal is being shipped from preference.

On the matter of seasonal rates on coal there is room for honest difference of opinion. We are among those who hold that such is not the panacea for our coal troubles, but that in some instances variable rates would prove of advantage, in others a disadvantage. It is an undisputed point that seasonal prices for anthracite have proven a powerful factor in stabilizing the production, and it is further evident that the ancient 50c. summer discount of the producer has ceased, with present high delivered prices, to be the incentive it once was for early buying by householders. It is a fair question therefore whether it is not now time to increase this differential to at least a dollar, either by lowering still further the mine price in the spring or by a combination on seasonal mine and freight prices.

Education in the use of coal is a well-intentioned part of the program, quite properly placed at the tail end, however. Cheaper coal is the shibboleth around which this association may gather the consumers, for the average householder in the hard-coal burning territory will never willing depart from the convenience and cleanliness of the larger sizes of anthracite in his home. Education in the substitution of soft coal and fine sizes of hard coal is more likely to come from the producers seeking markets.

The new association seeks to interest consumers of the fine sizes of anthracite—the larger users. One point in this connection should not be overlooked. The steam sizes of anthracite are priced at the mine to meet competition with bituminous coal at delivered prices. It does not seem at all improbable that any decrease in freight rate on steam sizes to Eastern markets would be at once absorbed in higher mine prices. Fine anthracite is a byproduct the selling price of which is governed by that of competitive fuels, not by cost of production. It is true that if the producer realize more for his byproduct, he can and will eventually be forced to lower the prices of household sizes, which is one of the aims of the new association.

Cold Starlight Nights

MINE operators do well to keep a weather eye to the nights having a rimeless frost, when the air is both cold and dry and enters the coal mines with an insatiable thirst. Perhaps the many explosions which we have recently had to record did not all follow such nights and it also is true that every cold night or day, rimeless or even foggy, does its share toward drying out the mines; nevertheless when the nights are cold and dry it is well to be especially active in keeping the mines wet and free of dust, the shots claytamped, of permissible powder and not too large or drilled onto the solid.

If every bright, brisk, cloudless night would make the manager of a coal mine as increasingly apprehensive of trouble as is a shepherd when he sees in the morning a dull red sky, so many of the accidents we are now having and have had might not have entered the record. Two weeks ago there were three explosions, one on Jan. 30 and two on Feb. 2, forty men in all being killed. Last week on Feb. 8 another explosion occurred, this time at the workings of the Marietta Coal Co. on Pinson Creek, Kentucky. Nine miners were killed, and three probably were fatally injured. The explosion occurred as the night force went into the mine.

However, by discussing the dangers of the winter months the impression may be given that care is necessary only in the winter. Far from that being the case, explosions are in season twelve months in the year, and to avoid them continuous precautions must be taken.

The lessons learned from the Monongah and Darr disasters are, it is to be feared, largely being unlearned by miners and managers. Surely these four recent explosions, involving about fifty lives, should suffice to awaken in the mind of everyone the danger that exists in a bituminous mine, always and everywhere and to all, and especially in Northern climes, during the winter.

The growth of better methods lives a precarious life. One year times are so good that everything is sacrificed to steady running and production. The next year times are so bad that there is no money to expend on safety, and morale fails because work is so irregular. Unless safety is made indeed the first consideration of mine workers, managers and owners, dust explosions will continue to occur with painful frequency.

When Should Battery Locomotives Replace Mules and When Be Preferred to Trolley Equipment?*

Favors Mules in Early Stages, Later Accumulator Locomotive, Then Trolley Equipment—One Battery Machine Saves $7,000 a Year—At Lynch Mule Haulage Costlier Than Transportation by Battery Equipment

BY CHARLES E. STUART
New York City

SO FAR as I have been able to determine, the first storage-battery locomotives for mine haulage were manufactured in 1897 or 1898 and were tried out in the Pocahontas coal field, but they were not sufficiently satisfactory to justify their continued use. Battery explosions were frequent and caused serious damage to the wiring, electrical equipment and the clothing and bodies of the motormen. Sulphuric acid was used as the electrolyte.

Experiments were then conducted with locomotives bearing reels of flexible cable through which connection was maintained between the motors of the locomotive and the trolley wire. At first these reels were turned by hand. Later the reels were revolved by contact with the wheels of the locomotive, being raised out of contact with the wheels by a lever, when necessary. About 1902 the plan of operating the reel by chain and sprocket wheels from one of the locomotive axles, as is still the practice, was devised. The popular floating motor-driven reel had its inception in the Pocahontas field prior to 1906.

RADIUS OF ACTION OF REEL-TYPE IS 500 FEET

The maximum radius of operation of the reel-type locomotive from the point of its connection with the trolley wire is about 500 ft. This is ample for room work and for certain entry work, but the need for a machine that would operate entirely independently of the trolley wire was so great that with the development of the storage battery renewed efforts were made to manufacture a successful storage-battery locomotive. About 1908 the gasoline locomotive was introduced. In spite of many objections to the use of this type of machine for such work, hundreds of these machines were purchased, affording excellent proof that a need existed for a machine operating independently of the trolley.

About 1913 several large manufacturers sought to produce a reliable storage-battery locomotive. For two or three years, although a satisfactory battery and thoroughly substantial mechanical parts and motors were available, the development was slow, because of the failure of manufacturers thoroughly to understand mine requirements, including the abuse and rough handling that mine machinery must undergo and the difficulty of obtaining proper attention for such machinery. The locomotive was insufficiently motored and frequently that manufacturer got the business whose conscience or lack of knowledge permitted him to furnish the smallest battery or the smallest motor that would make a fair appearance.

In the coal mines having the lowest haulage costs there will be found: Entry trackage of not less than 40 lb. weight well supported and well maintained on ties; room rails of 20 lb. Cars are of the greatest cubical content permitted by the height of the seam (in low seams) or (in high seams) by ease of loading; in well-managed soft-coal mines, where the shovel is used, cars with a cubical content as great as 235 cu.ft. are found. The track gage is not less than 36 in. and usually is over 40 in. The trips contain from 25 to 50 cars and the main-haulage locomotives weigh from 10 to 30 tons. There is double track on the main headings, good voltage at the working centers, the gathering locomotives are from 4 to 6 tons, and the workings are concentrated.

ADVANTAGES OF STORAGE-BATTERY LOCOMOTIVES

Within the car limits indicated, with a concentration of work and with general grades not exceeding 6 per cent, the collecting of cars from a number of places or rooms and the taking of them to a siding where the trip is made up for the heavy locomotives is work suited to the storage-battery locomotive.

Under these conditions, the storage-battery locomotive containing motors and batteries of ample capacity for the actual cycle of duty has the following advantages:

1. It is unnecessary to string trolley wire and to bond tracks away from the main haulageways.

2. In thin coal it is unnecessary to brush the top or to take up bottom in order to make the roadway high enough for the passage of mules.

3. No time is lost in making cable connections with the trolley on entering rooms, or in splicing the reel cable when it is cut.

4. The chance that personal contact will be made with the trolley wire is absent.

5. In a gassy mine, away from the well-ventilated headings, the absence of a spark at the wheel or the trolley may be a vital consideration. In those mines where safety lamps are required, it is only a matter of time before the use of the trolley and reel locomotive

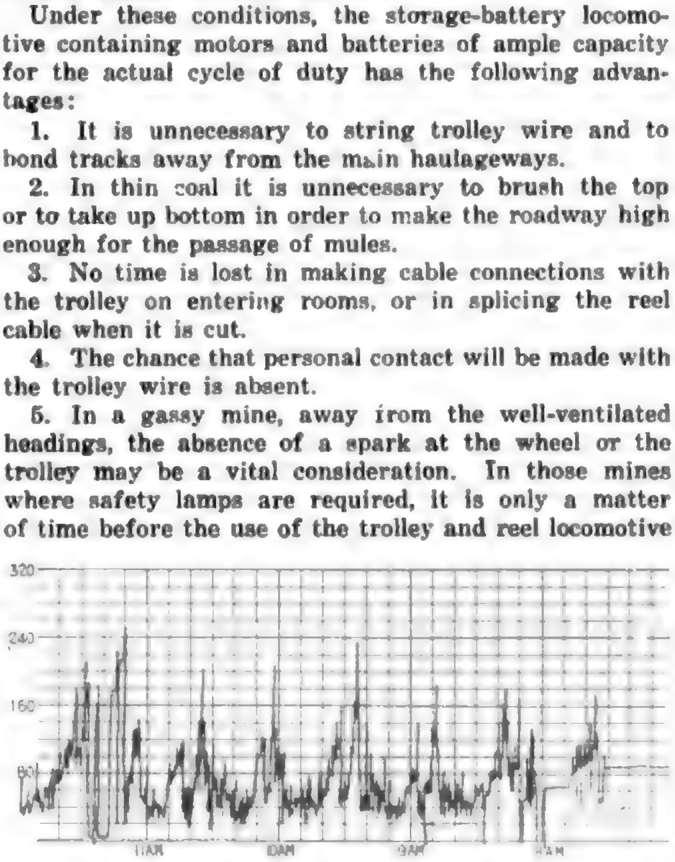

FIG. 1. GRAPHIC CHART OF POWER REQUIREMENTS

This mine-load curve is characteristic of soft-coal mines where the demands for pumping and ventilation are light. The haulage and cutting loads make frequent peaks which are reduced when storage batteries are used.

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*Paper entitled "Storage-Battery Locomotive as Applied to Mine Haulage," to be read before the meeting of the American Institute of Mining and Metallurgical Engineers, New York City, February, 1922.

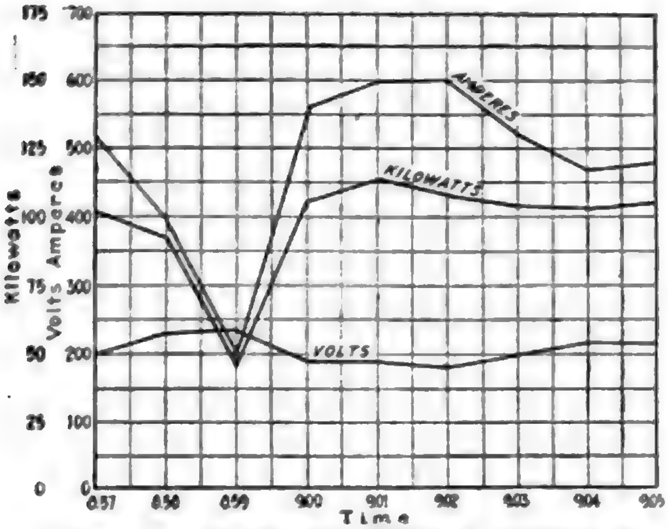


FIG. 2. CHARACTERISTIC CURVE OF DEMAND OF TROLLEY LOCOMOTIVES

The starting amperage of a heavy locomotive may exceed the heaviest amperage used in hauling.

for gathering will be prohibited. The storage-battery locomotive can be, and is being, made gas-proof and the locomotives thus designed will pass the tests of the U. S. Bureau of Mines.

6. The speed and haulage capacity of the machine, measured in pounds drawbar pull, will enable it to displace a number of mules and drivers and should materially lower the cost of gathering.

7. An invaluable consideration is that the storage-battery locomotive is independent on idle days of either substation or power plant. At such times a storage-battery locomotive may be used for handling supplies or for other purposes.

Battery Locomotive Evens Power Demand

A feature that has been given slight consideration but which is one of the most valuable characteristics of the storage-battery locomotive is its effect on the power demand, as shown by Figs. 1 to 4. In Fig. 1 is shown a mine-load curve that is characteristic of most soft-coal mines, except those with heavy pumping and ventilation requirements. Fig. 2 is a characteristic curve of the demand of trolley locomotives. The starting amperage of a heavy locomotive may exceed the heaviest amperage pulled in hauling. Fig. 3 shows that in the case illustrated the relationship of kilowatts consumed to possible output at normal rating is 19.35 per cent. It will be seen that the capacity of a substation or power plant must be related to demands of short duration, which invariably are trolley or reel-type locomotive demands. By contrast, the demand while charging a 6-ton locomotive containing the heaviest permissible battery will not exceed approximately 15 kw.

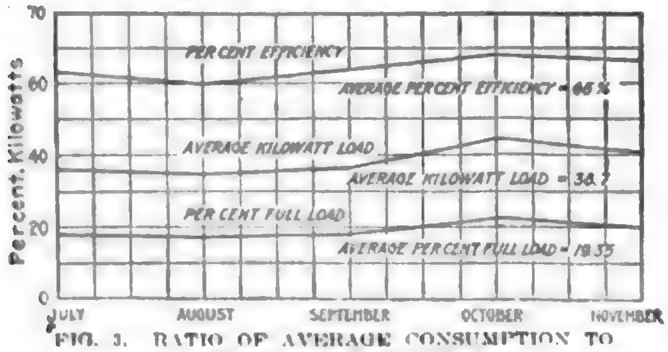


FIG. 3. RATIO OF AVERAGE CONSUMPTION TO FULL-LOAD CAPACITY

In the above chart the relation of the kilowatts consumed to the possible output at normal rating is 19.35 per cent. Such ratios are inevitable where trolley-and-reel type locomotives are making at intervals big demands for current.

Storage-battery locomotives may be charged outside of the day shift, when the demand on the plant or substation is light. As a result, the demand of this locomotive need not conflict with the demand of the trolley-type locomotive or with other demands where the plant is well loaded or where the power contract penalizes demand.

A large portion of all power required for coal and metal mines is being purchased and converted from alternating current to direct current through substations. Figs. 3 and 4 show the average efficiency of a mine substation during 5 months. In this instance 35 per cent of power was lost in the process of conversion; this figure is above the average. Although this loss in conversion for the actual battery charge may not be lowered where a small motor-generator set is used to convert alternating current to direct current for battery charging, as soon as a battery is charged, the charging set automatically shuts down; also the heavy loss entailed for operating a substation for charging purposes is eliminated.

Storage-battery locomotives are especially suited to new or small mines, from the standpoint of both investment and operating costs. I am now working on plans for a mine in which alternating current will be used for all stationary motor drives and for mining machines. For a short time animal haulage will be the cheapest form of haulage; but when the economic limit for this method of transportation is reached, it is proposed to purchase a charging set and storage-battery locomotives. In many cases with a small mine the storage-battery locomotive will be the most economical haulage unit for the life of the mine. With larger development the third step would be the introduction of the heavy trolley type of locomotive and the diversion of the storage-battery locomotive to gathering.

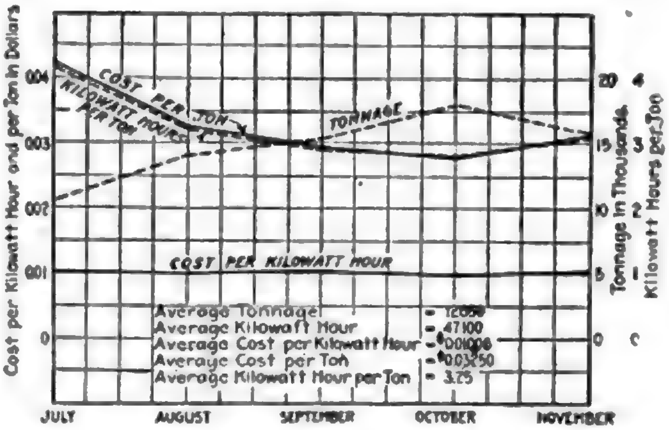


FIG. 4. OUTPUT, CONSUMPTION, COST PER TON AND PER KILOWATT-HOUR

It will be noted that the cost per kilowatt hour is little affected by the tonnage, so when the tonnage increases the kilowatt-hours per ton fall perceptibly.

The actual over-all efficiency of a storage-battery locomotive is lower than the over-all efficiency of the reel-type locomotive. The voltage loss between the substations or the power plant and the trolley type of locomotive, however, will almost invariably discount this advantage. I am inclined to doubt whether either the trolley type or the storage-battery locomotive has any advantage over the other in the matter of efficiency.

From the foregoing it may be assumed that within weight limitations I favor the storage-battery locomotive over the trolley or the trolley-and-reel type. As a matter of fact, I consider that each type has its own fairly well marked field. To define the limits would be exceedingly difficult; they must be determined for each mine. For instance, to describe the trolley locomotive as a haulage machine and the storage-battery locomotive as a gathering machine, as the term "gathering" is used, a classification that is often made, is unfair to both machines.

The standard trolley type of locomotive is equipped with motors of a capacity equivalent to 10 hp. to the ton of weight; that is, the 6-ton locomotive will be equipped with motors of 60-hp. capacity. The speed of this locomotive, at rated drawbar pull, will approximate 6 miles per hour. A storage-battery locomotive of the same weight will be equipped with a motor capacity approximating 4 hp. (maximum) to the ton and having a speed, at rated drawbar pull, of 3½ miles per hour.

If from other standpoints a given condition favors the storage-battery locomotive and if the cycle of duty is within the range of that locomotive and its battery capacity, there is little advantage in using a locomotive with a greater capacity. It is impossible to apply, however, a general rule and I am simply calling attention to salient points. A plan of a mine worked on the room-and-pillar system is given in Fig. 5. Mules are used for gathering and the work per mule per day in the different sections is given. Were a locomotive to be applied to the first right and first left entries, it would be necessary to cover 21 miles per day in order to handle 119 tons and to displace three mules. The same analysis applied to the entire mine will show that the number of mules displaced by locomotives would be insufficient to justify an investment in locomotives; in fact, the locomotives would cost more to operate than mules.

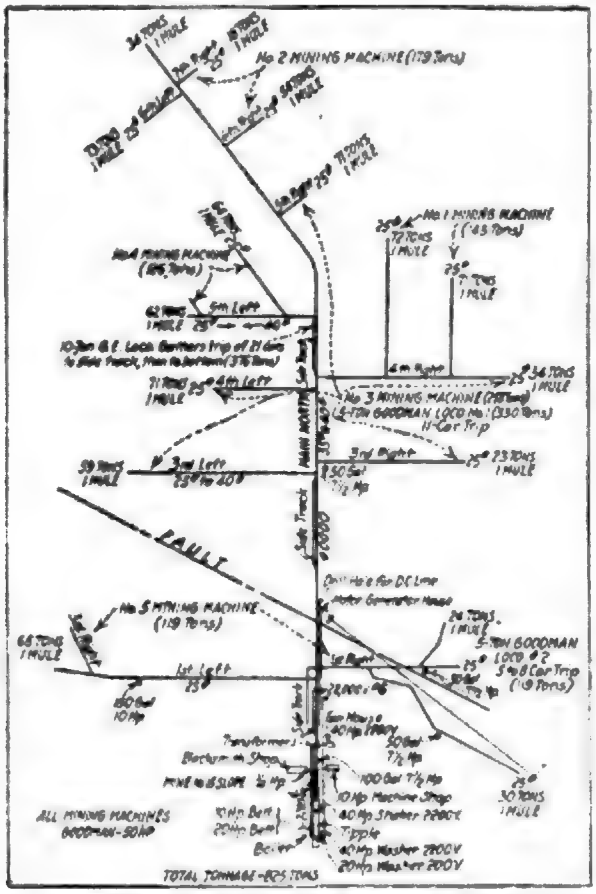

34 TONS 1 MULE
No 2 MINING MACHINE (179 Tons)
No 1 MINING MACHINE (143 Tons)
72 TONS 1 MULE
25°
71 TONS 1 MULE
No 4 MINING MACHINE (185 Tons)
5th Left
25° — 40°
4th Right
4th Left
25°
34 TONS 1 MULE
71 TONS 1 MULE
No 3 MINING MACHINE
6-TON GOODMAN LOCO No 1 (330 Tons) 11-Car Trip
3rd Right
25° 73 TONS 1 MULE
59 TONS 1 MULE
3rd Left
25° to 20°
MAIN NORTH
Side Track
FAULT
Drill Hole for DC Line
Motor Generator House
No 5 MINING MACHINE (119 Tons)
65 TONS 1 MULE
1st Left
25°
1st Right
26 TONS 1 MULE
5-TON GOODMAN LOCO #2 5 to 8 Car Trip (119 Tons)
10 Hp
Fan House 40 Hp
Transformers
Blacksmith Shop
50 Gal 7½ Hp
100 Gal 7½ Hp
10 Hp Machine Shop
40 Hp Shaker 2200V
Tipple
40 Hp Washer 2200V
20 Hp Washer 2200V
25° 30 TONS 1 MULE
ALL MINING MACHINES GOODMAN-50 HP
20 Hp Belt
Boiler
TOTAL TONNAGE-825 TONS

FIG. 5. ELECTRICAL EQUIPMENT MAP, GALLOWAY COAL CO.'S MINE NO. 15

The scattered workings in this mine do not favor gathering by straight storage-battery locomotive but by mule. Where the work is so distributed that small units suffice to do as much as a large unit, then the small unit—the mule, in short—is cheaper. However, the greater mobility of the recent types of combination trolley and storage battery locomotives is making this consideration less vital.

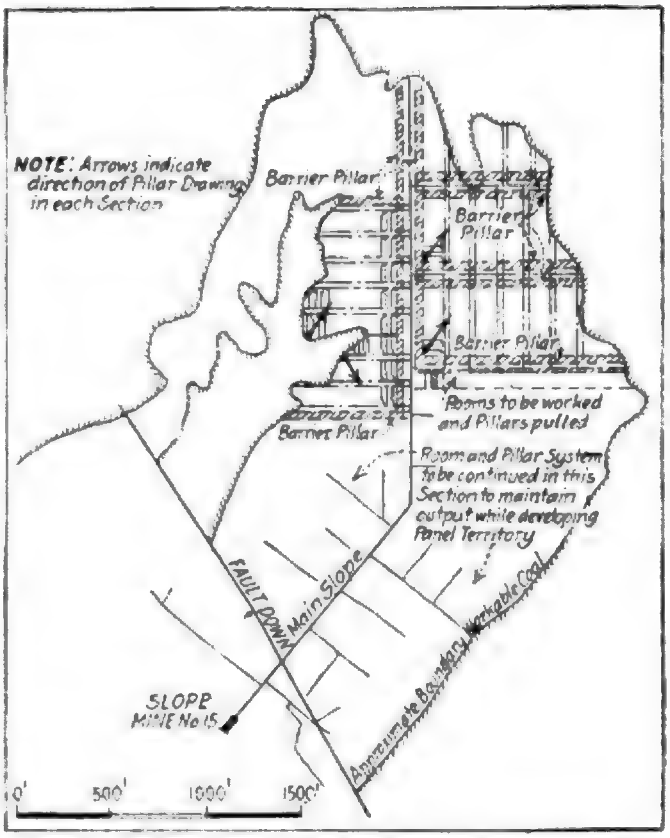

NOTE: Arrows indicate direction of Pillar Drawing in each Section
Barrier Pillar
Barrier Pillar
Barrier Pillar
Barrier Pillar
Rooms to be worked and Pillars pulled
Room and Pillar System to be continued in this Section to maintain output while developing Panel Territory
FAULT DOWN
Main Slope
Approximate Boundary Workable Coal
SLOPE MINE No 15
0'
500'
1000'
1500'

FIG. 6. SAME MINE AS IN FIG. 5 WITH EXTENDED LAYOUT

In the proposed extension care has been taken to so concentrate the workings as to make operation by storage-battery locomotive convenient and at the same time profitable. Concentration enables one locomotive to replace several mules.

A proposed panel system applied to this mine is shown in Fig. 6. We have projected this into the unworked area, as a continuation from the present limits of the room-and-pillar system. This panel system produces a condition of maximum concentration, which is the condition most favorable to the use of storage-battery locomotives.

REPLACES FIVE TO SIX MULES IN INDIANA

The Queen Coal & Mining Co., of the State of Indiana, gives the following comparative results from using storage-battery locomotives with the panel system:

"We are operating No. 4 mine on the panel system and aim to keep the trolley partings within 800 ft. of the room necks, which means that the battery locomotives have 800 ft. of entry haulage each way, or 1,600 ft. to the round trip. The entries and rooms are fairly level throughout the mine. The locomotives take all loaded cars from the working faces and make up trips of six to sixteen cars, depending on the number of rooms working in the entry. They then pull the trip to the trolley parting, returning with the same number of empties as they brought out, in order to keep the turn even. The empty cars are left at the room necks and pushed to the face by the loaders.

"The number of cars handled per day by the average locomotive depends entirely on mine conditions, such as the number of rooms working on an entry and the num

TABLE I—RECORD OF PERFORMANCE OF COMBINATION LOCOMOTIVE AT MINE OF UNITED STATES COAL AND COKE CO., AT LYNCH, KY.

Date	Hours Worked	Driver's Wages 70c. an Hour	Coupler's Wages 65c. an Hour	Current Consumption, Kw.-hr.	Current Costs $0.0175 per Kw.-hr.	Distance Covered per Day, Ft.	Number of Trips	Number of Loads Pulled	Number of Empties Spotted	Average Distance Covered per Trip, Ft.	Average Distance, per Car, Ft.	Average Level Distance per Trip of Total 43 per Cent., Ft.	Average Distance per Trip of Total 35 per Cent., Average of 7.7 per Cent. Against Loads, Ft.	Average Distance per Trip of Total 22 per Cent., Average of 4.1 per Cent. Favor of Loads, Ft.	Hr. Time Hauling Loads	Min.	Hr. Time Spotting Empties	Min.	Hr. Time Lost Waiting for	Min. Empties	Hr. Time Lost Waiting for	Min. Loads	Hr. Time Lost, Other	Min. Reasons	Average Time per Car, Full Trip, Min.	Weight of Trip in Cars, Coal and Locomotive Tons.	Weight of Trip in Cars and Locomotive, Tons	Net Tons Coal Hauled per Day.	Fixed Costs	Maintenance Costs
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		17		18		19		20		21	22	23	24	25	26
1	11	$7.70	$7.15	21	$0.37	48,690	3	37	41	16,238	623	6,978.9	5,680.5	3,570.6	2	50	3	51				30	3	53	4.7	66.0	35.9	96.2	$19.74	$1.82
2	10	7.00	6.50	20	0.35	48,216	2	40	48	24,108	547	10,366.4	8,437.8	5,305.7	1	57	2	09			2	06	2	58	2.8	106.0	61.2	104.0	18.39	1.80
3	9	6.30	5.95	16	0.28	48,080	2	40	36	24,040	632	10,337.2	8,414.0	5,288.8	2	30	1	58			2	04	2	08	3.5	106.0	39.4	104.0	17.14	1.73
4																													4.29	1.45
5	9	6.30	5.95	24	0.42	45,350	2	37	36	22,675	621	9,750.2	7,936.2	4,988.5	2	02	2	29			1	09	3	20	3.7	93.5	39.4	96.2	17.14	1.87
6	10	7.00	6.50	26	0.46	55,906	2	51	55	27,953	534	12,019.7	9,783.5	6,149.6	1	27	1	47		35	2	42	2	57	2.2	118.5	53.1	106.6	18.39	1.91
7	11	7.70	7.15	27	0.48	81,228	3	67	65	27,076	691	11,642.6	9,476.6	5,956.7	2	47	2	58	1	40	1	10	2	20	2.6	117.5	55.6	172.2	19.74	1.93
8	11	7.70	7.15	24	0.42	89,896	3	74	84	29,965	607	12,884.9	10,487.7	6,592.3	3	06	3			47		48	2	49	2.4	126.0	61.2	192.4	19.74	1.87
9	10	7.00	6.50	13	0.23	50,381	2	34	49	25,190	607	10,831.7	8,816.5	5,541.8		45	1	20	6	35			1	20	2.0	91.0	61.2	88.4	18.39	1.68
10	10	7.00	6.50	27	0.48	93,666	3	78	77	31,222	650	13,425.4	10,927.7	6,868.8	2	35	2	25			1	20	3		3.8	136.0	65.8	202.8	18.39	1.93
11																													4.29	1.45
12	11	7.70	7.15	21	0.37	50,360	3	37	41	16,786	645	7,217.9	5,875.1	3,692.8	2	36	3	21	1	35			2	58	4.5	66.0	35.9	96.2	19.24	1.82
13	11	7.70	7.15	28	0.49	92,022	3	77	67	30,674	639	13,189.8	10,735.9	6,748.2	3	19	2	59		30		10	3	42	5.2	136.0	56.6	200.2	19.74	1.94
14	10	7.00	6.50	27	0.48	93,004	5	63	61	18,600	750	7,998.0	6,510.0	4,092.0	2	42	3	34		50		34	2	25	3.0	66.0	33.6	163.9	18.39	1.93
15	11	7.70	7.15	26	0.46	97,335	3	61	61	32,448	798	13,952.6	11,356.8	7,138.5	3	03	3	56	1	08			2	33	3.4	106.0	52.0	158.6	19.74	1.91
16	11	7.70	7.15	28	0.49	106,526	4	77	80	26,657	678	11,462.5	9,329.9	5,864.5	4	05	3	35				25	2	55	2.9	101.0	52.0	200.2	19.74	1.94
17	11	7.70	7.15	29	0.51	103,393	4	69	74	25,843	738	11,112.4	9,045.0	5,685.4	3	10	4	20					2	40	3.1	91.0	48.5	179.4	19.74	1.96
18																													4.29	1.45
19	12	8.40	7.80	28	0.49	98,824	4	63	60	24,706	803	10,623.5	8,647.0	5,435.3	3	48	4	45					2	42	4.0	89.5	34.5	172.2	21.09	1.94
20	10	7.00	6.50	30	0.53	47,946	2	50	50	23,973	479	10,308.3	8,390.5	5,274.0	2	30	4	05					3	05	3.9	131.0	63.5	130.0	18.39	1.98
21	12	8.40	7.80	29	0.51	99,065	3	60	62	33,021	812	14,199.0	11,557.3	7,264.6	3	10	3	10					4	55	3.1	106.0	53.3	156.0	21.09	1.96
22	11	7.70	7.15	26	0.46	86,621	4	64	62	21,655	687	9,311.6	7,579.2	4,764.1	2	45	2	55	1	30		33	2	47	2.7	86.0	41.6	166.4	19.74	1.80
23	12	8.40	7.80	27	0.48	81,630	3	55	53	27,210	755	11,700.3	9,523.5	5,986.2	3	46	4	19				14	3	26	4.4	97.5	36.4	165.0	21.09	1.93
24	12	8.40	7.80	26	0.46	117,748	4	73	79	29,437	774	12,657.9	10,302.9	6,476.1	3	24	4	26	2	20			2	05	3.0	97.0	51.3	189.8	21.09	1.91
25																													4.29	1.45
26	12	8.40	7.80	27	0.48	99,660	5	63	61	19,832	803	8,527.7	6,941.2	4,363.0	3	38	3	48	2	40		10	1	29	3.5	69.0	33.6	163.8	21.09	1.93
27	12	8.40	7.80	29	0.51	80,140	4	58	58	20,035	690	8,615.0	7,012.2	4,407.7	3		4	29	1	40		15	1	39	3.8	78.5	39.3	150.8	21.09	1.96
28	10	7.00	6.50	22	0.39	91,004	4	59	59	22,751	771	9,782.9	7,962.8	5,005.2	2	40	3	07			2	15	1	38	2.9	79.5	39.8	153.4	18.39	1.48
29	10	7.00	6.50	23	0.41	117,570	4	75	72	29,392	799	12,638.5	10,287.2	6,466.2	3	22	3	55				15	2	03	2.9	99.5	39.4	195.0	18.39	1.96
30	11	7.70	7.15		0.39	69,748	3	53	52	23,249	664	9,997.0	8,137.1	5,114.7	2	10	2	18	2	40		41	2	45	2.5	94.0	45.7	137.8	19.74	1.84
31	10	7.00	6.50	24	0.42	106,609	4	60	60	26,652	838	11,460.3	9,328.2	5,863.4	2	42	2	55			1	17	2	46	2.8	81.0	40.5	156.0	18.39	1.87
						2,200,622	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.											Avg.					
						416.7 mi.	3.2	58.3	59.3	25,236	690	10,851.5	8,832.7	5,551.9											3.3					
		$203.00	$188.70	670	$11.71	15.4 mi. per day	per day								75	49	87	18	24	30	18	38	73	18		2,635.0	1,270.3	4,098.4	$540.89	$56.66

NOTE—Fixed operative costs in Column 25 are obtained by adding the driver's wages (Column 3) to the coupler's wages (Column 4) and allowing 12c. daily for motor-house rental and 20 per cent of supervision cost, $1.32 daily for interest on investment at 6 per cent, $1.23 for depreciation on locomotive at 10 per cent, $1.62 daily for depreciation of battery, figured on a seven-year life, 60c. daily for supervision cost per locomotive. These items total to $4.89 daily. Maintenance costs are obtained by adding to current consumption costs (Column 6), costs of repair parts at $150 per locomotive year, or 41c. per day, cost of labor on repairs, one hour per day or 80c daily, cost of repair shop (20 per cent of parts and labor costs) or 24c. daily.

ber of men working in those rooms. One day all the loaders may work while the next day from five to forty men may be out; this varies the tonnage and work done by the individual locomotives. When the first storage-battery locomotive was installed, a good motorman and trip rider, without difficulty, could gather from 140 to 160 cars in 8 hours; as they became more familiar with the operation of the locomotive the number of cars gathered gradually increased until as many as 264 cars have been gathered in an 8-hour working shift by a locomotive operated by a good motorman and trip rider; 200 to 210 cars are frequently gathered by one locomotive.

"The empty cars weigh approximately 1,000 to 1,200 lb. and hold from 2,200 to 2,600 lb. net of coal; all are of the plain-bearing type. Taking the weight of a loaded car as 3,200 lb. and 15 cars per trip, a train load weighs 24 net tons, plus 5 to 5½ tons for the locomotive. Thus, 220 tons net of coal are gathered and hauled to the parting per day by a locomotive gathering 200 cars. Unfortunately, due to our small cars, our turnover is very large for the tonnage hoisted.

"Taking everything into consideration, five to six mules and as many drivers would be required to replace one battery locomotive where it has a chance to work at least 7 hours a day continuously. Furthermore, if we had not introduced storage-battery locomotives, we would have been compelled to brush the roadways to make headroom for the mules. The locomotives are 33 in. in height from the rail to the top of the locomotive and weigh 5 tons.

Taking the cost of one locomotive, charging panel and necessary equipment to operate same as	$5,000.00
Interest at 6 per cent	300.00
Depreciation on locomotive chassis at 5 per cent	195.60
Repairs, such as brake shoes, lamps for headlights, springs, controller parts, etc., at $3 a month, which is ample	36.00
Depreciation of battery, per year	1,056.00
Labor, 1 hr. a day at 94c. an hour, to insert charging plugs and do any miscellaneous work necessary on the locomotive, as we cannot pay the men less than 1 hr. for overtime	188.00
One motorman, at $[illegible].13 a day	1,626.00
One trip rider, at $7.50 a day	1,500.00
Current for recharging battery, average of 25 kw. per day, and covering all line losses $1.50	300.00
Total cost of operating one battery locomotive for one year, working 200 days	$5,201.60

"The cost of gathering with mules and drivers to replace one storage-battery locomotive, using six mules and six drivers for this work, is as follows:

Cost of six mules, at $135 each	$810.00
Interest at 6 per cent	48.60
Depreciation, at 25 per cent., on mules in low coal	202.50
Keeping six mules 365 days at $1.25 each, which covers the cost of feed, harness, shoeing, insurance, stable care, barn boss, medicines, doctor, and other expenses in taking the mules in and out of the mines daily	2,737.50
Six drivers, at $7.50 a day	9,000.00
Total cost of operating six mules, 200 working days a year	$11,988.60

"If it would require six mules and six drivers to do the work of one storage-battery locomotive, at a cost of $11,988.60, and the total cost of operating a locomotive is $5,201.60, there is a net saving in favor of the locomotive of $6,787, or more than sufficient money to pay for the complete cost of installation of a locomotive. Even though the conditions are liable to change in some parts of the mine, where four mules could do the work of one locomotive, the locomotives would still be the more economical."

The Bon Ayr Coal Co., of Indiana, says: "Our cars are of the roller-bearing type, weigh approximately 2,000 to 2,200 lb. empty, and carry 6,000 lb. of coal net. We have two 6-ton storage-battery locomotives in operation and two others ordered. The longest run that a locomotive has to make in a given entry is 1,700 ft., or 3,400 ft. to the round trip, of which 200 ft. has a grade of 2 per cent against the load and 200 ft. has a grade of 5 per cent in favor of the load. The rest of the road is almost level. Half the rooms are fairly flat or slightly in favor of the load; the other half have a grade of 1½ to 2 per cent against the load.

"The storage-battery locomotives, as well as the reel-gathering locomotives, leave the bottom of the shaft with ten empty cars, which they place at the necks of ten rooms. They then take from the working faces of ten rooms, the rooms being driven to a depth of 250 ft., ten loaded cars, making up a ten-car trip which is hauled to the shaft bottom. A 25-lb. rail is used in rooms and for cross entries.

TABLE II—SUMMARY WITH REMARKS ON TABLE I

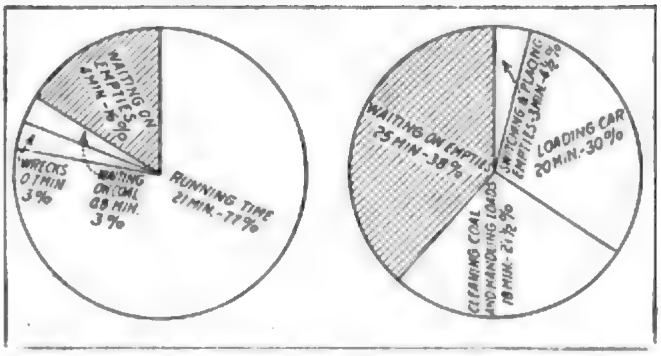
Tons hauled in month	4098.4
Total cost per month	$597.55
Average cost per ton	$0.145
Mules replaced	8
Mule drivers and crab men replaced	8
Cost of operating per mile	$0.135

REMARKS

Previous equipment used in same section, 8 mules, 8 men, and 2 crab units	
Feed @ $20.00 per month each	$160.00
Depreciation at 25 per cent at an average cost of $175	29.16
Interest on investment @ 6 per cent	7.00
Shoeing, stabling, and harness	16.00
Drivers and crab men at actual time locomotive worked	1,624.00
Monthly costs	$1,836.16
Locomotive monthly costs	597.55
Saving monthly	$1,238.61
Saving yearly	$14,863.32

COMPARATIVE RESULTS

Per ton cost hauled by mules	$0.448
Per ton cost hauled by locomotive	0.145
Per ton saving	0.303



FIGS. 7 AND 8. DIAGRAMS SHOWING PERFORMANCE OF MOTORS

In Fig. 7 the average time consumed by a trip was 27.39 minutes, of which the actual running time was 21 minutes. In Fig. 8 the trip waited on empties almost as long as it took to make an average trip in Fig. 7. The average trip in Fig. 8 took 66 minutes.

"Taking 2,400 tons as the average daily hoist, with eight locomotives, each locomotive would have to handle 100 cars per shift, if the cars contained 3 tons each. But as it is impossible to make loaders average 3 tons net per car, it is often necessary for the locomotives to deliver 140 cars and take out 140 loaded cars in order to produce the tonnage of the shift.

"The locomotives are 39½ in. to 40 in. in height; the ties are 3 x 4 in. and the rail 3 in. high, which gives a total height of 46 in. from the bottom to the top of the locomotive. There is a 6-in. clearance between the top of the locomotive and the roof in our thinnest coal. In many parts of our mine the coal is much thicker and naturally gives a greater clearance.

"The locomotives have gathered 16-car trips, but when working twenty rooms on an entry, with all men in, the 10-car trips work out satisfactorily, as that leaves ten rooms at which the motormen drop off ten empties and ten rooms from which to take out loaded cars. If there should be twenty-four rooms working on an individual run, the motorman would deliver twelve empty cars and take out twelve loaded ones.

"Mules would not be able to handle our work, as the cars, if loaded to capacity, would weigh over 4 tons, and the best the average mule would be able to handle would be one car at a time, thus the mine would be full of mules. Also, 3,400 ft. for a round trip with heavy cars would be beyond the mule capacity through a shift.

"The reel type of gathering locomotive has given good service, but the storage-battery locomotives will gather more coal at less expense. Also, if the power is off temporarily and there is plenty of coal shot down they can continue to gather and haul the coal until the supply of empty cars has been exhausted. Furthermore, for miscellaneous hauling on idle days or nights it is not necessary to start up a generating unit of any kind in order to operate them.

"At the end of a day's work the locomotives are charged through a rheostat switchboard from a 250-volt direct-current circuit. As the switchboard is automatic, an attendant is unnecessary. The charge is started on the locomotives and as each battery is fully charged the charging circuit is automatically cut off. It is necessary to add water two or three times a week to each battery to replace the water evaporated; this requires about 15 minutes for each locomotive. Outside of general inspection, oiling, etc., no attention is required other than that which should be given any piece

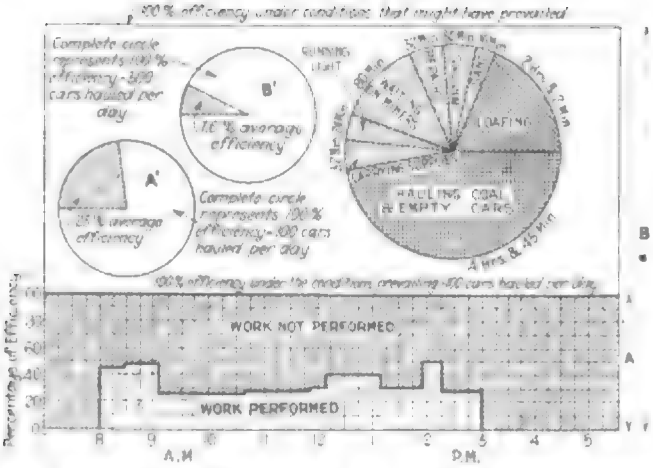


FIG. 9. GRAPHIC ANALYSIS OF DAILY PERFORMANCE OF LOCOMOTIVES

The above is practically characteristic of mine haulage in general. Similar tests made several weeks later, after power and other conditions had been improved, indicated a 100-per cent increase in productive effort and a proportional decrease in the equipment needed for the work performed, power consumption and other incidental costs. A represents possible work under prevailing conditions; B, possible work under conditions that might have prevailed.

of mining equipment at the end of the day's work."

John B. Hicks, assistant superintendent of power and mining, Consolidation Coal Co., in a paper read before the Kentucky Mining Institute, June 4, 1920, said: "Over a period of three years 3,003,361 tons were hauled at a cost of 12c. per ton. These figures cover renewals and the daily care of the battery, which includes the flushing as well as all necessary repairs. They do not credit the battery locomotive with the recovery of rails and pillar work or with the hauling of supplies or the bailing of water, but only with the actual coal tonnage hauled."

In all of the preceding statements only the true storage-battery locomotive, as distinguished from the combination storage-battery and trolley type locomotive, has been considered. The primary purpose of the latter locomotive has been the conservation of the battery charge. This locomotive, when operating under a trolley wire, will receive its power directly from that source and at the same time the storage battery will receive a charge.

Table I, showing the performance of the combination locomotive, was compiled after a careful study for a month at the Lynch mines of the United States Coal & Coke Co., at Lynch, Ky.

The performance of motors and loaders in a given mine, as obtained by a careful time study, is given in Figs. 7 and 8. Fig. 7 shows the time lost by a locomotive while waiting for empties. In this case the loss is small, being but 16 per cent of the total. Fig. 8, on the other hand, shows that the time spent by loaders waiting for empties is 38 per cent of the total. It was the opinion of the mine operating department that additional locomotive equipment was necessary, but these charts clearly indicate that the curtailment of production was caused by an insufficient number of mine cars. The purchase of additional locomotives, instead of being helpful, would have been hurtful in this case, both from an operating point of view and from the standpoint of cost.

This fact is further shown by Fig. 9, which is the summary of a series of analyses made at several mines. The performance shown is more characteristic of delays encountered or permitted than is indicated in Figs. 7 and 8. To sum up, a locomotive should not be blamed for those conditions that prevent the locomotive from working to the capacity for which it was built. Many locomotives are blamed for delays of one kind and another that reduce the tonnage handled by it, but this is more true of the storage-battery locomotive than of any other type.

One important manufacturer has developed a combination locomotive. It is equipped with two motors, one driven by the storage-battery charge and the second by a current from the trolley wire. This second motor is built up to 35 hp. for the 6-ton machine, and the locomotive is designed, when driven by this motor, to produce its rated drawbar pull at 6 miles per hour. The successful application of this principle will represent a valuable step forward in the development of locomotives for mine haulage. There are many conditions in which, in addition to the actual work of gathering, the locomotive should be capable of strictly haulage duty, in the sense of speed and sustained drawbar pull.

On account of space limitation, the motor receiving the full voltage from the wire has a lower rating than the present haulage locomotive, though equal to that applied to the haulage locomotive of a few years ago.

What is Your Production Record?

DURING the past several years *Coal Age* has been asked repeatedly such questions as: "What is the biggest day's work known for a single mine hoist?" "What is the world's record output for a single mine?" "What is the greatest tonnage ever taken from a single mine opening (shaft or slope) in one 8-hr. shift?"

In all of these queries the idea is the same. It would be a "fair bet" that some mine had just made the biggest day's run in its history; the officials of that particular operation felt a justifiable and altogether commendable pride in their accomplishment; they would like to spread the good news beyond the confines of their local community but hesitate to do so because they fear that some other operation has long ago beaten their output. As a result they write to the editor in the full belief that from him they can learn exactly how they "stack up" with the rest of the industry before they begin making too much "noise."

Now the editor gladly furnishes such information as he has available, but at the present time he is by no means sure just what the "record" really is. While it is quite true that various figures have been published from time to time, it is not certain that those published, say, in 1920 hold as records in 1922. Record productions are constantly being bettered. Just when the officials of one mine think that they have a record "clinched," some other operation exceeds their tonnage by a substantial margin. Sometimes it is they themselves that turn this trick.

Take as an example the No. 3 mine of the Superior Coal Co., at Gillespie, Ill. In June of 1920 this operation averaged 4,813 tons per day, with a maximum day's output of 5,140 tons. This surely looked good as a record hoist, but in less than six months this same mine with the same equipment had beaten this mark by somewhat more than 10 per cent!

As a reader of *Coal Age*, if your mine has made a day's run of which you are proud, won't you write in and state the facts? Record outputs in each class, of course, will be published.

Wide Range of Combinations of Coal Essentials Hinders Fixing of Universal Specification Standards[*]

Relative Values for Different Fuels Determinable Only for Particular Time or Plant — Knowledge of Coals More Helpful Than Specification Mechanism — Sound Contract Expresses Mutual Agreement Based on Accurate Information

BY GERALD B. GOULD[†]

IN MAKING specifications for coal buying there is no way of establishing all coals in a scale of values, for the simple reason that there are an infinite number of combinations of the essential characteristics to be found in individual coals and many different requirements. In a rather crude way at the present time the laws of supply and demand set up differentials in price, but these are constantly in a state of flux. Take a broad distinction: that between semi-bituminous coals and the small sizes of anthracite. In general the relation of the heat value and other characteristics as between these broad classes remains the same, and yet for a particular consumer their relative value at the mine would be changed by an increase or decrease in freight rates, even though it were a percentage increase or decrease covering all kinds of coal. This introduces another difficulty. Coal prices from the seller's point of view are prices "at the mine," yet between the mine and the consumer is a more or less rigid system of freight rates, in many cases double or triple the mine price. And the relative value of coals must be determined by the consumer on the basis of the cost of the coal at his plant.

NOT POSSIBLE TO SET UP UNIVERSAL STANDARDS

It seems clear, therefore, that we cannot set up universal standards, nor can we determine relative values for different coals, except for a particular time and plant. Surely, therefore, the device of specifications will not simplify the selection of coal by determining, once and for all, relative values.

Now go a step further. Assume that a particular consumer is about to obtain bids under specifications, and assume that he has determined definitely the limitations within which a satisfactory coal must come. For the sake of simplicity leave out everything but ash and heat value, and assume that this buyer can and has satisfactorily operated his plant on a coal which averages 12 per cent ash and 13,800 B.t.u. dry. If he set this as a standard, and the bidder delivered coal with 8 per cent ash and 14,450 B.t.u. dry, he would, according to a proposed set of specifications which I have before me, pay 22c. a ton above the upset price.

It might be said there is nothing out of the way in this. The buyer would obtain a more valuable coal and pay more for it in proportion. That is the purpose of specifications. Right here is where many coal buyers make a mistake by not thinking clear through to the conclusion. Whether he did or not, we will assume that the buyer in this case received as many heat units per dollar from the better coal at 22c. higher price as he would have received from coal of his standard value at the base price. Where the mistake is made is in not looking beyond this adjustment. In the case of a commodity like coal, about which so little accurate information is generally available, there is not yet any relationship between value and prices offered. It is not only possible but frequently occurs that two coals as far apart as 13,800 B.t.u. and 14,450 B.t.u. will not only be offered at prices which are as much as or more than 22c. apart but the higher price may be asked for the poorer coal.

In other words, any standard in coal specifications is just as much a part of the price as the number of dollars and cents per ton. Unless one knows coal values to begin with, there is nothing in the specifications mechanism which prevents him from paying more than he needs to in any given market for a given quality of coal. There is right now, for example, a certain large consumer buying coal under specifications which obligate him to pay a premium of 25c. a ton for coal of only average quality, and the base price for this kind of coal at the time this contract was made was not 25c. below the general level of prices. This is simply because the "standard" was placed too low or, what amounts to the same thing, the price was too high for the quality of coal described as "standard." The high price, however, was expressed in the standard, instead of in the dollars and cents per ton, and so escaped notice.

EXACT KNOWLEDGE ALWAYS ADVANTAGEOUS

The important thing in buying coal, assuming one knows the particular limitations of his plant, is to know the actual values of the coal under consideration. This knowledge, taken with the price, will enable the buyer to make the best choice. Then, and only then, should specifications play their part. Then in an ideal world, which of course does not exist, the seller and the buyer would both agree that the coal should average of a certain value, and as an assurance to his customer the ideal seller would enter into a contract to maintain this quality, or be paid more or less as his actual performance exceeded or fell below his standard.

The first principle of a sound contract is that it expresses as nearly as language can the *mutual* agreement of the parties to it. The lawyers call it a meeting of the minds, and the courts tell you that unless there actually was a meeting of the minds there was no valid contract. But how can minds meet in minute detail on a matter about which one side or the other, under conditions as they exist today, is almost sure to be either uninformed or misinformed?

Coal specifications have worked smoothly and efficaciously in a relatively few instances, where the buyer had the means of getting at the underlying facts and where the seller was reliably informed as to the actual value of his product. These were in cases, too, where the tonnage involved justified the expense of carrying out the technical provisions of the contract in regard to sampling and testing, and where the sampling and testing methods were so arranged as to command the confidence of both sides. In many other cases specifications buying has *seemed* to work well merely because both sides were able to carry the contract through without any differences, or they have *seemed* satisfactory to the buyer because he made deductions, or to the seller because he obtained premiums. In fact, in many of these cases the specifications as a device for adjusting price to value did function properly, but what if they did, if the standard from which the adjustments were figured was out of line with the market at the time the contract was made?

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[*] Second and concluding installment of Mr. Gould's article on coal specifications; the first part appeared Feb. 9, under the caption "Specification Systems Should Not Be Permitted to Eliminate Judgment in Coal Buying." Published also in *Purchasing Agent*.

[†] Vice-president, Fuel Engineering Co. of New York.

Relation of Specifications to Coal Price

You sometimes hear specifications spoken of among buyers as a means of bringing down the price of coal, and some think of deductions from the price under specifications as if they represented savings. Any substantial difference over the period of a contract, either above or below the base price, is evidence of a faulty standard for the coal in question. If the standard and price are in line with the market, and the standard is a representative one for the particular coal, the buyer will save money by paying premiums. If a buyer has exacted consistently large penalties, he has, consciously or unconsciously, taken advantage of a seller who has been either misinformed or uninformed as to the quality of his coal. It may be answered that that is something for the seller to look out for, and so perhaps it is, but even so it does not make a sound basis for the conduct of business.

There are many technical features to the successful use of specifications, such as an equitable basis for price adjustment for quality above and below a standard, and sampling and testing methods, which might be discussed at length. The attempt here has been, however, to get beneath the superficial view of coal specifications. This discussion might be summarized as follows:

No Substitute for Accurate Knowledge

A coal specification is part of a business contract. To be sound it must represent a genuine agreement between buyer and seller. To this end, both must be adequately and accurately informed before the contract is drawn. At the present stage of development of the art of coal buying neither the buyer nor the seller, speaking generally, is sufficiently informed to operate coal buying on a specification basis without running risks as great as those they are trying to avoid. It is my belief, after plenty of opportunity to observe specifications in actual use, and after fifteen years of intimate contact with the problems of both buyers and sellers of coal, that any attempt to bring about the sudden use of coal specifications would be harmful to both buyers and sellers; that coal specifications are a proper and logical conclusion to coal negotiations carried on with full information and adequate technical facilities for sampling and testing, but that their general adoption, if ever, should come by gradual development, through the influence of a steadily widening knowledge on both sides. Coal specifications are not a cure-all nor will they ever furnish a substitute for accurate market information, which includes knowledge both as to prices and coal quality.

"An' They Are Still Goin' 'Round"

SHED a tear for Joe Hooten. The sad but thrilling story of Joe's experience back in 1913 with an early and boisterous specimen of combination trolley and battery type mine locomotive has just been exhumed from the ancient annals of a Utah mine. The story proves that that justly famed character in agile rubber boots who jumped from the umptieth floor of a burning building and couldn't come to anchor, had nothing on Joe. Joe couldn't either. But he did his noble and blasphemous best, aided and abetted by the entire mine gang. A pleasant time was had by all present, as reported in this letter from Joe's foreman, Pete McGinnis, written to an official:

Mushroom hollo oct the 10th 1913

mr. horace Alexander lectercal enjuneer Young man's butte Utah.

dear air i got your letter askun did the new combinayshun storage battry an troley locomotiv run it does we put it on the circular track in number 7 mine an jo Hooten the motorman wanted to show off

an he jammed

the controler handul over as hard as he could an the locomotiv started an is going yet we cant turn the power off the line cause one of the ginnies in the power stashun tride to throw the switch and didnt no how an we had

fourth of july an the last days of pompay all to once an we gobbed the ginnie yesterday an will have to shoot jo to keep him from starvin to death this combinayshun stunt is great i dont think wen the locomotive leaves the troley wire it runs on the battry an wen it gits back on the troley wire it charges the battry an is reddy for another round them motors is so danged hot you can smellum a mile but on that circular track the locomotiv is making about 78 r.p.m. per minute we made up a anker of cast iron with a steel kabul an wen jo whisked around on the 2 hunderdth lap we throwed the anker to him an jo he throwed it out and the locomotiv stopped

"AN' HE LIT ON THE HOT MOTOR AN' SWOAR SUMPIN' AWFUL."

so sudden that jo went right on in the direckshun of room 143 entry 46 but the kabul broak an

the locomotiv ketched up with jo and wen he fell he lit

on the hot motor an swoar sumpin awful an they are still going round wat can we do this is

hell

yours truly pete McGinnis

Reinhardt Thiessen, associate research chemist of the U. S. Bureau of Mines, is continuing his study of the origin and composition of coal. He has examined bituminous coals from different beds in Pennsylvania, Alabama, Kentucky, West Virginia and Ohio. An investigation has begun in co-operation with the Pennsylvania State Geological Survey to study the relationship between the composition and the distillation products of coals, cannel coals, cannel slates and bone coals of Pennsylvania.

In co-operation with the research bureau of the American Society of Heating and Ventilating Engineers, tests have begun at the Pittsburgh Experiment Station of the U. S. Bureau of Mines to determine the heat transmitted to the firepot alone of a small house-heating boiler when a definite quantity of coal is burned. Later additional sections will be added to the heater and the increase observed in the quantity of heat transferred.

Scraper Loading Well Adapted to Thin Seams Where Coal Will Not Slide from Face to Mine Car

Description of Scraper That Without Turning Reciprocates Between Haulage Road and Dislodged Coal—Gets Under Material and Does Not Tend to Mount It—Costs of Production Under Unusual Difficulties

By Dever C. Ashmead[*]
Kingston, Pa.

Each succeeding year in the anthracite region of Pennsylvania the production of coal becomes more difficult. Gradually the thick beds are being exhausted and thinner ones must necessarily be worked. It would not be far from the truth to say that only about 50 per cent of the yearly output is now being obtained from the thick measures and that consequently an equal amount is being produced from thin beds. These may vary in thickness from as low as 18 in. in some places up to 4 ft. in others.

Steeply pitching beds are mined with less difficulty than those which are flat. In the former it is possible for the miner to stand erect while working and he is not compelled to shovel his coal into mine cars, as it will run away from him down the breast.

As a miner will not stay in a room where he has to push coal on sheet iron even over short distances, it is extremely difficult to induce men to work in these low places. Of course it is possible to brush the top or lift the bottom and carry a roadway up the room so that the men may load directly into mine cars, but this is extremely expensive and is feasible only on slight pitches. Furthermore it makes the cost of a ton of coal so high as to be practically prohibitive. Even in flat beds and in breasts having a roadway the coal in many instances has to be pushed across the room or reshoveled before it can be loaded into mine cars.

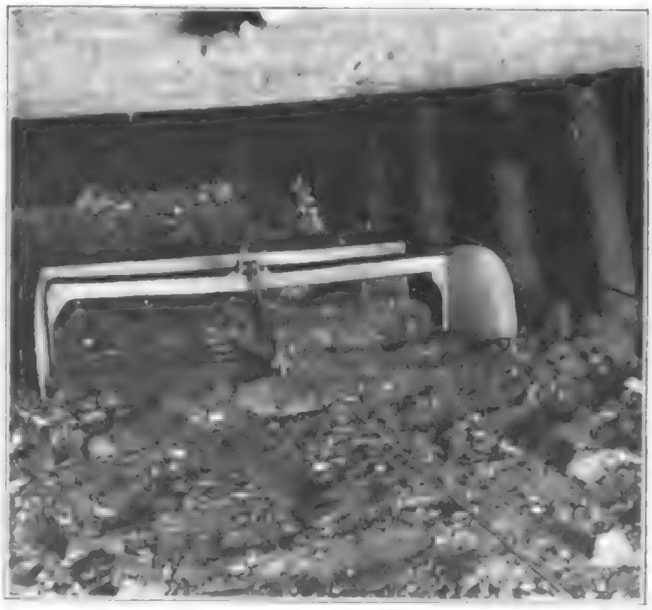
Shovel Has Just Two Sides and an End Gate

One type of scraper, and the method of operation suited to its construction, which have not yet been given extensive publicity, doubtless will be of interest to both anthracite and bituminous operators. The device is known as the Strange scraper and it differs radically from those of the ordinary type. Scrapers usually are built in the form of a *V* and in order to be loaded must be turned with the open end toward the coal, so that the scraper will fill as it is drawn through the loose material. Then by means of posts and pulleys it is turned round so that it will drag the coal down the room to the loading chute. This *V*-type of scraper has a tendency to ride upon or over the material being dragged and it is often necessary to use manual labor to force it into the coal, so that it will pick up its load.

The Strange scraper, being of an entirely different construction, operates in another manner. Instead of the sides being set at an angle they parallel each other, being about 6 ft. apart. Both ends of the scraper are open but the rear end is provided with a door. This is hinged at the bottom and is built of great strength. The ropes that operate the scraper are attached to it in such a manner that when the device is being pulled into the room the door is open and lies flat on the floor of the breast. When the scraper reaches the coal that has been shot down, the opened door digs its way under the loose material. After the door has been fully buried under the coal the hoist is reversed so that the rope that pulls the scraper back down the room, being attached to the inside of the door, closes it and throws the coal into the body of the scraper. This digging into the coal and reversing is repeated two or three times, so that the scraper will become fully loaded. When it is full it holds about one and a half tons of coal and as a rule only two trips from the roadway to the face are required to fill a mine car.

In the chamber in which I recently saw one of these scrapers at work the roof was weak, a double line of props being required in a 24-ft. room. These props were set about 8 ft. apart and on 6-ft. centers. Boards nailed along the base of the props acted as a chute in which the scraper moved up and down the room. It was necessary to set props within 10 ft. of the face. This prevented the scraper from operating to best advantage. Previous to shooting the coal a jack was set close to the face of the room and the scraper rope passed through the snatch block upon it. The coal was then shot down, but without disturbing the jack.

Immediately after shooting it is possible to operate the scraper and commence loading coal. With the face full of loose material this is easily done, as the scraper has only to dig into the dislodged mass once or twice



SCRAPER COMING UP ROOM FOR A LOAD OF COAL

With its lower and only jaw wide open and so far under the coal as to be hidden the scraper is entering the room. As soon as it is pulled back this door or jaw lifts, carrying the coal with it in its outward motion.

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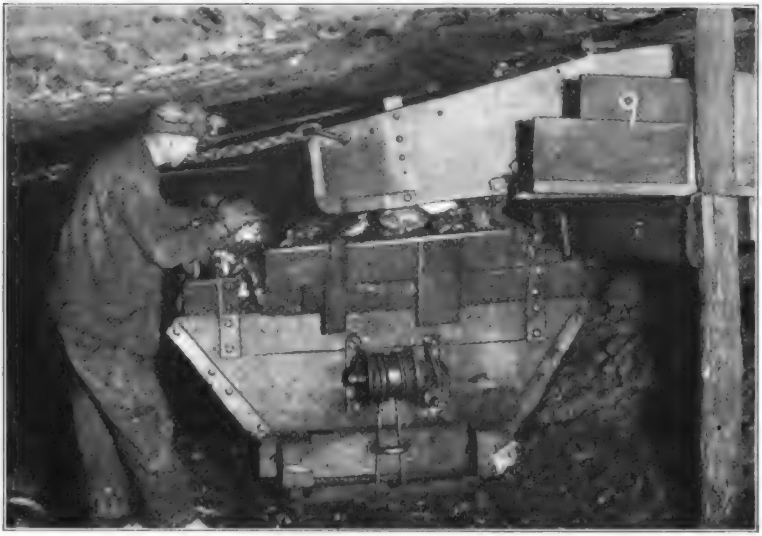
[*] Anthracite editor *Coal Age*.



Loading Into Car

In this case the gangway is well below the coal bed; consequently the coal readily drops into the mine car without need of an adjustable apron. Note the chain for dragging the scraper and the wire rope by which the rear door is lifted. Also note that the scraper has no bottom but drags the coal along the mine floor. In a room 250 ft. long a three-ton mine car can be loaded in six minutes, using a hoisting engine having a rope speed of 150 ft. per minute.

in order to get a full load. Immediate operation of the scraper aids in clearing the smoke from the room, thus permitting the men to get back to the face quicker than they could if it were necessary to wait for the smoke to clear up in the usual manner.

As soon as it is possible to re-enter the room one man goes up to inspect the result of the blast and if everything is in proper condition he takes his position at the signal button and through it directs the movement of the scraper. When the space immediately in front of the jack post is cleared, the signalman moves the post to one side or the other, so that the scoop may have plenty of loose coal to load.

In this manner all the coal in a room can be loaded into mine cars without any of it being moved by hand shovel, except that which lies in the corners of the room or which may have been thrown behind the props by the force of the blast. In rooms where it is necessary to set the props in a double row and close to the face they interfere with the operation of the scraper and in such a case some coal must be shoveled by hand in order that the coal may be brought within reach of the scoop.

In a room 250 ft. long it is possible with this type of scraper to load a three-ton mine car in six minutes, using a hoisting engine having a rope speed of 150 ft. per minute. If plenty of coal were available, cars were always on hand and no delays were experienced it would be possible with one crew to load at a maximum rate of ten cars per hour, or eighty cars per day. Of course this is out of the question, as it is necessary to change the position of the jack props, shovel some of the coal by hand, and move the scraper from room to room. Besides this it is practically impossible to shoot down sufficient coal in these low beds to give a full day's run for any scraper crew, unless an excessive number of rooms are worked.

Before going into the matter of the cost of producing coal by this means a brief description will be given of the conditions under which the scrapers are now working. In the heading shown in the accompanying map, which we shall call *A*, the scraper is operating in coal about 28 in. thick. Only two breasts are being worked. The coal is loaded into mine cars and the same hoisting engine that operates the scraper actuates a short rope haulage system that pulls the cars to the main heading. Here they are discharged into a chute, when empty returning to the mouth of the chamber for reloading. The roof is weak and, as has been stated, it requires two rows of props, which have to be carried within 10 ft. of the face.

The next place where the scraper is used is in a pillar hole. Here the coal is only 26 in. thick. This pillar hole is designated on the accompanying map as place *B*. In the third section, shown at *C*, the coal runs from 18 to 25 in. thick, the method of mining being longwall. The hoist at this point is mounted on a locomotive and two scrapers are used.

About the same sized crew is at present employed in all the three places just mentioned. Some of the work is done on company time and some on contract. The daily rates of pay on which the company men work are as follows: Driller or miner (drills and shoots two breasts), \$5.53; helper, \$4.91; timberman, \$5.52; hoist man, \$5.11; working foreman, \$5.52; laborer, \$4.91.

In addition to the above the men are paid a bonus. Before this bonus becomes operative they are required to furnish one car for each man employed. Then for a second car each man receives 10c., for the third car, 15c., for the fourth, 20c. and for the fifth, 25c. The average bonus per shift per man for the month of August was 21c.

The mine cars have a capacity of 113 cu.ft., which is approximately 3 tons of coal. The average colliery yield is about 2.4 tons of cleaned coal per car. This of course includes the material from the steep-pitching breasts, where it is impossible to separate the rock underground. However, in the thin beds where the scraper is used the product is practically clean coal, so that the yield in marketable fuel per car considerably exceeds the average.

In section *A* the mining cost per car is between \$8.78

and $3.84 and the delivered cost on the main haulage road is between $4.20 and $4.40. This work is done on company time. The average number of cars loaded is small because of the condition of the roof and the fact that only two working places are available instead of three or four, which the crew should be able to handle easily. Two scrapers are at work and the average number of cars per scraper per shift is 4.25.

In section *B*, which is a pillar hole, the work is done on contract. Here the coal is delivered to the main hoisting slope, 2,000 ft. away from the working face, at a contract price of $5.50 per car. This scraper, as might readily be expected, averages only 3.2 cars per day.

Section *C* is worked longwall and two scrapers are used. Here the coal is thin and an average of 3.7 cars per day is produced. The cost, delivered to the main haulage road, is $4.25 per car.

Contrast these costs with those in similar but thicker beds where the coal can be loaded by hand shovel into mine cars. To give an example: A certain bed is 6½ ft. thick, of which 4 ft. is coal. The bed being flat the mine cars are run to the face and loaded by hand shovel. The cost per carload under these circumstances varies from $4.60 to $5.20.

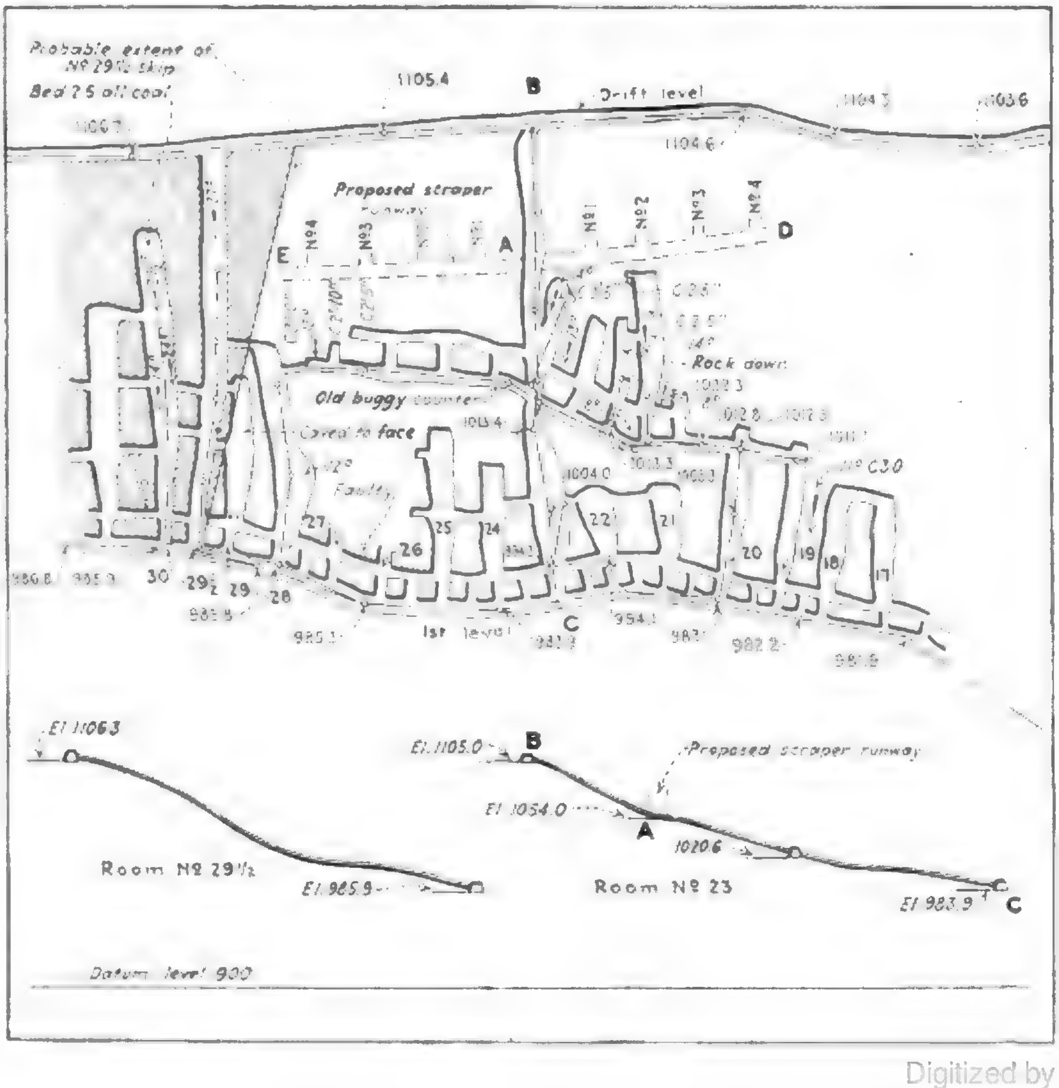
In another instance where the bed is 7.2 ft. thick, 4.2 ft. of the measure being coal, and where the pitch is sufficient to assure that the coal will run on sheet iron the cost varies from $5 to $5.40 per mine-car load. It is necessary in this case to shovel the coal from a platform into the mine car.

Thus in spite of the unfavorable conditions under which the scrapers are operated in this mine the cost of the coal produced by this means is no more and as a rule less than that obtained by any other method employed. At other places the cost per mine car, no matter what the method followed may be, greatly exceeds the cost given above. The comparison is really not fair to the scraper, for if the average costs for the colliery were compared to the scraper costs the latter would show up in a much more favorable light.

Mining, as everyone knows, involves various problems that crop up from time to time and demand solution. Referring to the map accompanying this article, from the cross-sections near the bottom the conditions that must be met will be readily appreciated. From the point marked *A* to that designated as *B* it is possible for the coal to be slid on sheet iron whereas from *A* to *C* the pitch is not sufficiently steep for this to be accomplished, yet it is too great for mine cars to ascend without the aid of some kind of rope haulage.

In order to overcome the difficulties encountered in mining this coal a scraper will be placed in breast 23 and operated from *C* to *A*. The rest of the procedure planned will be found detailed in the subcaption of the map which illustrates the method to be adopted.

Whether this arrangement will do everything it promises to accomplish remains to be seen. On the face of it, however, the proposition appears to possess marked advantages. Of course, only time and trial can determine whether these are sufficiently great to overbalance the objections.



Scoop-Shovel Operation

From B to A the coal will slide on sheet iron. From A to C it will not, yet the grade, as will be seen, is too steep for mine cars unless some form of rope haulage is provided. The coal will be mined in breast 23 by scraper and at A a heading will be turned toward E and D following the contour of the coal. Scrapers will be placed in both these roads receiving the coal from the sheet-iron troughs by breastways driven up the pitch from each roadway. Coal will be transferred from A by scraper and will be loaded into mine cars at C. In this way advantage will be taken of the pitch where it is adequate, and the scraper will move the coal where the grade is unfavorable—that is, where it is too easy for the sliding of the coal and too steep for the use of mine cars.

Large Combustion Chamber in Rear of Boiler, to Which Heated Air Is Admitted, Increases Efficiency

Air Heated in a Flue Passing Under Combustion Chamber, Is Emitted Through Passages in the Bridge Wall, Causing the Combustion of Unburned Hydrocarbons and Carbon Monoxide

By Alphonse F. Brosky*
Pittsburgh, Pa.

SPEAKING collectively, boilers at the power stations of coal mines give somewhat lower efficiencies than those installed at other industrial plants. Usually but little real excuse exists for the extremely low efficiencies sometimes found.

Losses due to the escape of unburned hydrocarbons to the stack are those which yield most readily to improvements in design. In order to successfully consume the gases given off by coal during the coking process, it is necessary to mix them thoroughly with sufficient air to insure their combustion, raise the mixture to the temperature of ignition and allow sufficient time for their burning before they come in contact with any cold body and become chilled.

In order to obtain these results as well as to diminish the infiltration of air through the brickwork and reduce the radiation from the boiler the H. C. Frick Coke Co. at its Hecla No. 1 mine has adopted the setting shown in the accompanying illustrations. The variation from standard practice here delineated is known as the Barry-Pollins smoke-consuming and power-developing device, J. J. Barry one of the designers, being a machine boss at this operation.

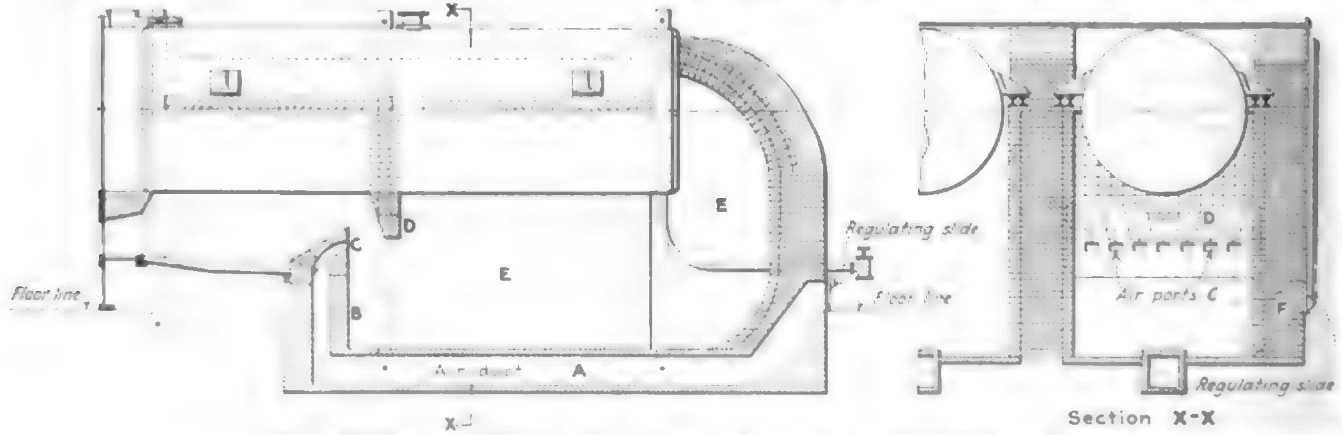
It will be observed that this setting differs in two particulars from that ordinarily installed. A duct, *A*, draws air from the rear of the boiler, leads it under the floor of the combustion chamber *E*, thence up through the bridge wall and delivers it through a series of openings, *C*, at the rear face of this wall near its top. A second and inverted bridge wall or heavy baffle, *D*, placed a few inches in the rear of the first, extends downward from the boiler shell to a point somewhat below the top of the first wall. As this completely fills and blocks the inverted spandrel openings between the shell of the boiler and the setting, the products of combustion leaving the fire are deflected downward between the two walls. They are thus "choked" between two white-hot firebrick surfaces, caused to move at comparatively high velocity, while at the same time they are mixed with the air from the duct which has become heated while passing under the floor of the combustion chamber and upward through the bridge wall.

After emerging from the space between the bridge wall and baffle the mixture of gases and air enters the combustion chamber, where its velocity is greatly reduced. Ample time is thus afforded for the burning of whatever constituents are combustible.

In this setting the rear end is not only generous in its proportions but is built in the form of an arch, the brick work of which is comparatively thin. The boiler shell, as may be seen, is supported by brackets resting on rails built into the side walls. Taken as a whole, this arrangement facilitates or rather provides for the expansional distortion of the boiler shell. The rear arch is not covered with magnesia or asbestos but with a mixture of puddled clay and horse manure.

This clay arch covering is applied in several layers, each being allowed to dry thoroughly before the next is placed, the boiler being fired lightly meanwhile. When the clay has been built up layer upon layer until it is almost flush with the brickwork, a finishing coat of cement mortar is applied. This type of covering may be readily placed, its initial cost is slight and the results from its use have been entirely satisfactory.

This type of boiler setting and covering minimizes the losses arising from incomplete combustion and reduces those resulting from radiation. The quantity of air admitted to the bridge wall and thence to the combustion chamber may be readily regulated in accordance with the existing rate of combustion by means of the slide damper at the intake end of the duct. As an alternate arrangement to that shown, applicable



ARRANGEMENT OF BOILER SETTING TO BURN A HIGH-VOLATILE COAL

An air duct, A, passing along the warm floor under the boiler travels up the bridge wall and delivers air through openings, C, close by the baffle, D. The burning gases meet this current air and are consumed in the combustion chamber, C, at a point quite remote from the boiler. They are then directed by the rounding end of the boiler to the return tubes after combustion has been completed

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*Bituminous editor *Coal Age*.

where boilers are set singly or in batteries of two each, the duct may be arranged with a side opening, *F*, so as to extend transversely through the bridge wall only. This arrangement is shown dotted in the section *XX*.

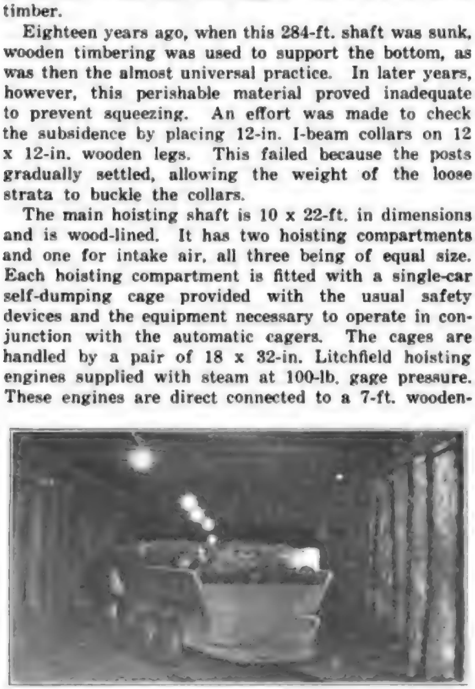
Provision for the admission of excess air to the combustible gases within a boiler setting at the exact point where it will do the most good is particularly efficacious at those times when the grates become partly or entirely clogged with clinker. Natural draft at such times is insufficient to draw enough air through the fuel bed to effect complete combustion, and much burnable gas is evolved. This setting therefore increases the all-day or average efficiency of the unit by raising it at those times or during those periods when it would normally be lowest. Application of this setting at the Hecla No. 1 plant has proved so conclusively successful that the Frick company officials felt warranted in adopting it as a standard for installation at those plants to which it is suited.

In Retimbering a Shaft Bottom, Posts and Foot Timbers Are Set in Deep Trenches

THE Lower Freeport bed as mined by the Younghiogheny & Ohio Coal Co. in Mine No. 1 at Amsterdam, Ohio, is characterized by an exceptionally weak roof. This requires an excessive amount of "timbering" even in unimportant headings, 5- and 6-in. I-beam collars being used, supported by 8- or 10-in. sawed oak legs and lagged with 3 x 5-in. sawn timber.

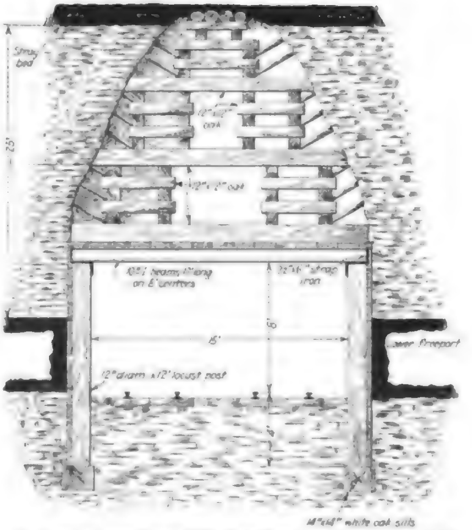
Eighteen years ago, when this 284-ft. shaft was sunk, wooden timbering was used to support the bottom, as was then the almost universal practice. In later years, however, this perishable material proved inadequate to prevent squeezing. An effort was made to check the subsidence by placing 12-in. I-beam collars on 12 x 12-in. wooden legs. This failed because the posts gradually settled, allowing the weight of the loose strata to buckle the collars.

The main hoisting shaft is 10 x 22-ft. in dimensions and is wood-lined. It has two hoisting compartments and one for intake air, all three being of equal size. Each hoisting compartment is fitted with a single-car self-dumping cage provided with the usual safety devices and the equipment necessary to operate in conjunction with the automatic cagers. The cages are handled by a pair of 18 x 32-in. Litchfield hoisting engines supplied with steam at 100-lb. gage pressure. These engines are direct connected to a 7-ft. wooden-lagged drum, the unit being provided with a Roybel emergency governor and steam brake. The airshaft is provided with a single-decked cage operated by a pair of 8 x 10-in. second-motion engines. It is used for emergency purposes only.



LOCUST POSTS IN AMSTERDAM SHAFT BOTTOM

Timbers are 12 in. in diameter and 12 ft. long and are set on 14 x 14-in. oak sills the top of which are sunk 4 ft. below the top of the rail.



MEANS OF HOLDING TOP WEAKENED BY STRAY BED

No reliance is placed on the weak material under coal but a footing is sought 5 ft. 2 in. below the top of the rail. Criss-cross timbers support the arch formed by the rock that has rattled down up to a stray coal bed 25 ft. above the measure worked.

On the south or load side of the bottom the heading was originally 17 ft. wide. The shaft timbers were carefully reinforced before the legs of the old timber sets were removed by dynamite. This latter operation was slow inasmuch as the old timbers supported loose strata extending upward 25 ft. to an overlying stray coal bed. As fast as this loose material was cleaned up a trench on each side of the heading was dug to solid rock, footings placed and timbers set. All timbering was completed as the work progressed.

The method used in supporting this shaft bottom is a departure from the practice usually followed in timbering. Locust legs with a minimum diameter of 12 in., carrying 10-in. I-beam collars are placed on 3-ft. centers. This material was readily available and in the preliminary plans and estimates it was found that this method of framing would prove adequate for the purpose throughout the probable life of the mine.

The framing was extended for 500 ft. on the south side of the shaft and is lagged behind the legs throughout this entire distance. On the north side of the shaft the work was less complicated, as sufficient width and headroom afforded an opportunity to carefully reinforce the old framing. The illustrations show the general plan of this work as well as some details.

By working two shifts of men this job was completed in ninety days. More than 15,000 tons of rock and other refuse were hoisted to the surface and hundreds of tons gobbed in old workings. The mine officials are to be congratulated that not a man was injured while prosecuting this somewhat hazardous undertaking to a successful conclusion.

Problems of Operating Men

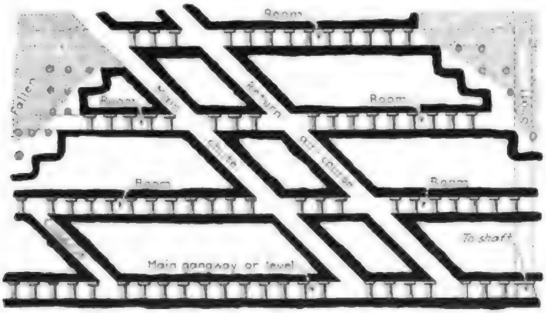
Edited by James T. Beard

Working a Vertical Coal Seam

Chutes Driven on a Forty-Five-Degree Pitch and Rooms Turned Forward and Back, on Twenty-Foot Centers—Coal Worked Out in Stopes on the Retreating System of Mining

REFERRING to the inquiry regarding the best way of working a vertical coal seam, which is said to vary from 10 to 15 ft. in thickness, *Coal Age*, Nov. 3, p. 726, allow me to outline a plan I have seen in successful operation, in working coal lying at a high angle.

Assuming that headings or levels have driven right and left in the seam, as described in the reply to this inquiry, the plan I have in mind involves driving a pair of chutes on a 45-deg. pitch. These chutes, as shown in the accompanying figure, are driven up from the level, starting a short distance from the mouth of the cross-tunnel connecting the seam with the shaft, or from the bottom of a slope driven in the seam itself.



VERTICAL PROJECTION SHOWING CHUTES AND ROOMS WORKED IN STOPES

Rooms Driven as Levels

As indicated in the figure, rooms are turned forward and back from these chutes, at regular intervals. The rooms are turned on 20-ft. centers and driven about 4 ft. in height, leaving a 16-ft. pillar of solid coal between consecutive rooms or levels.

The rooms are driven the full width of the seam, but the height is kept low to afford a better support for the footwall, which in this case is said to be weak. Also, driving low rooms requires less timber in the first working.

The general plan is to work out the coal on the retreating system, by driving the rooms to the boundary and working back on the pillars, which are stoped out, after the usual fashion. The coal in the upper pillar is worked in advance of the one beneath it.

The most difficult part of the plan occurs in drawing back the pillars, which are 16 ft. thick and worked out in benches or stopes. Each pillar lies vertically over the one below it. As the coal is taken out, heavy crossbars are put in place reaching from footwall to hanging wall.

Much of the work is done by the miners standing on platforms resting on these crossbars. At times, some of the coal is left above and supported by timbers, in order to afford sufficient protection to the men working below.

In driving the rooms, crosscuts are driven at such distances apart as will comply with the state law. These crosscuts are necessary to keep the ventilating current up to the working faces, in the same manner as when working a level seam. The crosscuts are sometimes cut in the form of a stairway to enable men to pass from one room to another.

The same system can be employed whether the seam is reached by a cross-tunnel driven from a shaft, or a main slope is driven in the seam itself. In the latter case, however, the rooms driven back from the chute toward the slope are stopped at a distance that will provide a wide pillar for the protection of the slope.

As all the rooms are driven the full width of the seam, greater safety is provided when substantial cribs are built at regular intervals in each room. This provides a vertical chain of cribs, one above the other, in each consecutive room.

One disadvantage in chute work is the necessity of carrying all the timber up the chutes. Care must be taken not to drive the rooms too high or too far for safety. I would suggest leaving as small a pillar as will be safe and giving special care to the timbering of the rooms and the placing of the crossbars.

River Herbert West, N.S. Canada. "MAC."

Another Letter

I HAVE been reading the inquiry of a Colorado engineer, asking for the best method of working a vertical coal seam in which the coal ranges from 10 to 15 ft. thick. The writer states that the seam was originally opened by a slope and cross-tunnel at a depth of 100 ft. below the surface. Later, a shaft was sunk to a depth of 200 ft. and the seam tapped by a second cross-tunnel. From each of these openings, levels were driven to the right and left in the seam.

The reply to the inquiry takes up the question of working out the coal, by driving rooms to the rise from these levels which is practically the only thing to do under the conditions named. The rooms are opened by first driving a loading chute at a proper angle for loading and then widening out the room to the full width of the seam and working the coal by overhead stoping.

Allow me to suggest, here, that it would have been a far better plan to have opened this seam by sinking the shaft in the coal. Then, the shaft would have paid for itself by the coal taken out and there would be no rock to hoist, which is all deadwork in sinking a rock shaft or rock slope.

As soon as the shaft sunk in the seam has reached a sufficient depth to provide good protection for the workmen, levels should be driven to the right and left from the shaft and the coal worked out by stoping, in the usual manner. In adopting this plan, it will not be necessary to open rooms to the rise. To insure safety, the levels should be driven to the boundary before stoping is commenced, the coal being taken out on the retreating plan.

It is only necessary to add that the work of driving the levels and stoping out coal should progress downward, the upper levels being worked first and made secure by substantial crossbars and cribs to protect the men below.

Twinton, Tenn. LEE JONES.

Certificate vs. Experience

Holding certificate does not make a man more competent in the mine—Experience the chief factor required in successful mining—Practice in English mines—The vest-pocket ticket in place of certificate.

REGARDING the question of certification of mine foremen, assistant foremen and firebosses, it is the farthest from my thought to attempt to destroy any advantage that has been gained through the amendment to the certificate law in Pennsylvania.

At the same time, it must be admitted that the holding of a certificate does not make a man any more proficient than he was before he obtained the paper. It simply makes him eligible for appointment under the old law, which required the certification of all mine foremen, assistant foremen and firebosses.

FOREMEN NEED BOTH THEORY AND PRACTICAL EXPERIENCE

Assuming that the certificate has been obtained by honest study and the passing of a thorough examination before an honest examining board, it is true that the study and training through which the candidate passed before taking the examination has given him a knowledge of the theory and principles of coal mining.

On the other hand, where the holder of a certificate lacks the experience that alone can make him a successful foreman, he has yet to gain the one chief factor necessary in supervising mining work. In saying this, I do not wish in any wise to discount the value of theoretical knowledge.

The successful mine foreman is the man who combines with his practical experience a knowledge of the principles of mining. He must understand the rudiments of geology, mechanics, gases, ventilation and be able to apply that knowledge to the work underground.

I have known men who could not write out or sign the reports they were required to make, and yet they hold certificates of service granted them by reason of their practical knowledge and experience in the management of underground work.

MUST HAVE EXECUTIVE ABILITY

My conclusion is that the understanding of conditions in mines and having an intelligent knowledge of the safe and economical methods of dealing with them, together with the executive ability required in bossing, are the prime factors in the mining of coal today.

It is not the scroll upon the report book, which marks the signature of the man who made the examination of a section of a mine, that shows his ability to produce coal. Neither is it the possession of a certificate. In place of these, it is the careful foresight into conditions that surround the work and which goes far to prevent accidents that may tie up, perhaps, the entire mine.

Let me say to the young man who has just obtained his certificate, Strive for an appointment where you will have the benefit of older and more experienced men than yourself. By so doing, you will learn much that you did not know before and which will be of service to you in the years to come.

On several occasions, I have appointed an uncertified man to perform the duties of my regular fireboss who might be sick for a time. My mind was then always at rest, because I knew the man I appointed had the knowledge and the experience to perform the work.

AMERICAN VS. ENGLISH PRACTICE REGARDING CERTIFICATION

Compare, for a moment, our American practice, in this regard, with the prevailing custom in English mines, which are worked under greater disadvantages than our own and yet produce coal on a paying basis. If my understanding is correct, the mine manager is the only official required to possess the government certificate.

The "overman," who corresponds to our mine foreman, and the fireboss, though held morally responsible for the performance of their respective duties, have nothing to certify them but a vest-pocket ticket given them by the manager when appointing them to the positions they hold.

The overman performs all the work that falls to the lot of our mine foreman. When in the mine, there is no time given to discuss topics of the day. Every minute is devoted to the study of what is required to get out the coal and keep the mine in a safe condition. Let me say, here, that the attitude of both the overman and the fireboss, in this regard, is reflected in the manner in which every man in the mine performs his work.

THE VEST-POCKET CERTIFICATE

As I have just remarked, neither of these men hold more than a vest-pocket ticket certifying to their ability to perform the duties in their charge. Should one of them not come up to the standard, this ticket is taken from him and given to another man, who is at once put in his place.

In my opinion, this practice is well worthy of our consideration in connection with the matter of certified mine officials. A certified manager who appoints his own staff to operate the mine will seldom fail, because the responsibility rests in his own hands and the experience of men will determine their appointment.

Gans, Pa. R. W. LIGHTBURN.

Another Letter

False economies, the result of lack of study—Present depression and labor unrest disheartening to operators—Remedy lies in patient study of all conditions—Maintain every incentive to study.

MANY readers of *Coal Age* have given their opinions in regard to the certification of mine officials, which most of the writers seem to favor strongly. To say the least, the requirement that mine officials shall be certified is progressive.

Certification is an incentive to study. The reason that many false economies are being practiced, in the mining of coal, today, is not solely the result of the present industrial depression; but is largely to be attributed to the lack of study and reading, on the part of mine officials in charge of operations.

The present depression, together with the prevailing unrest of labor, must be very disheartening to operators and mine officials alike. In combating this condition, many officials, particularly those of the uncertified class, are adopting ways and methods that must prove expensive in the end. They do not realize that these are false economies, because of their lack of acquaintance with the practical side of the mining problem.

REMEDY LIES IN STUDY

Regarding the situation from every angle, my conviction is that the remedy lies chiefly in doing all in our power to increase the incentive to study, on the part of mine officials of every class.

At this point, let me advise all certified men not to get the idea that they *know it all*, and develop a spirit of disregard for the orders given them by higher officials who, it may be, hold no certificate and yet are probably well educated men having trained minds.

While an order coming from an uncertified superintendent may not appeal to a certified foreman as being the most efficient method to follow, it must be remembered that the instructions of the higher official are to be obeyed.

The fact that a mine superintendent has not the same opportunities to study the situation and learn the ways and means best adapted to the performance of certain work, should enlist the sympathies and interest of those mine foremen who have made a study of the principles of mining, and should lead them to a different attitude toward their superior officers.

NEED OF BROADMINDED MEN

It is my firm belief that foremen who are broad minded can always find some way to approach their superintendent on matters regarding which they differ. It will generally be found that these superintendents are educated men and, as such, are broad minded and when properly approached will gladly listen to suggestions coming from their foremen.

It is natural and right that a mine superintendent would not take kindly toward any dictation from a foreman, and that must be avoided if there is to be no friction between these two officials.

By way of suggestion, let me ask, how would it be if operators or mine superintendents were to require quarterly or monthly reports from their foremen, and request that these reports should embody any suggestions that the foreman might think would add to the efficiency of the work.

If this plan was adopted, it would

eliminate the idea that the foreman was dictating to his superior officer, and would go a great ways toward establishing friendly and cordial relations between the men.

Again, we have heard in the past and will continue to hear much regarding governmental control of mines. There must be a cause for this and I repeat, let us study the situation carefully to ascertain the cause and its remedy. The more we study, the more we help to advance the interests of coal mining. Let us, then, maintain every incentive to study on the part of mine officials. W. H. LUXTON.

Linton, Ind.

Mine-Car Hitchings

Many kinds of coupling links on the market—Single links cheapest and most reliable—Three small links and two clevises give good satisfaction.

THERE is much of interest in the letter of James Thompson, *Coal Age*, Dec. 8, p. 927, which draws attention to the delay and annoyance caused by the bending of car links so common in mining practice. At the close of his letter Mr. Thompson has suggested the need of employing some means of overcoming this trouble.

From the standpoint of convenience as well as safety, the matter of adopting a good form of link for a car hitching is one worthy of careful study and consideration. Most of us will agree that every kind of hitching on the market has its advantages and disadvantages.

THE SINGLE-LINK HITCHING

The single link has the advantage of being cheap and, if kept in order, is reliable on haulage roads having varying grades where the trips hauled are subject to much jerking, which is hard on the couplings.

The chief difficulty, in use of the single link is keeping the links in safe working order. In speaking of the single link, I refer to the hitching commonly known as the "link-and-pin" coupling. I can hardly agree with Mr. Thompson, however, who regards this as far superior to the hitching consisting of three small links and two clevises.

It is true, as he has clearly explained, the single link is easily bent by its hanging low and being jammed when the bumpers come together. This not only causes a dangerous strain on the pin, bending it so that it cannot be quickly and safely put in place when making a coupling, but the bent link must be straightened before being again used in making a coupling.

THREE LINKS AND TWO CLEVISES

In my experience, the three small links and clevises have proven so convenient and safe that, taking everything into consideration, it pays to go to the extra expense of using them. As now made, this form of coupling has been so improved as to eliminate the chief difficulty found in its use, which was the danger of losing part of the coupling. Formerly, that was a drawback that led many to discard that form of coupling for a single link.

As is well known, when a coupling is to be made with the single link, the latter must be lifted and guided into the hole of the approaching bumper. Many a trip rider has lost one or more fingers, or been otherwise maimed when performing this act.

My chief reason for regarding the three links and clevises as a better form of car hitching is the advantage it affords, by enabling one to make a safe coupling. When doing this, the clevise is held by the hand in a position where there is no danger of the fingers or hand being caught when the bumpers of two cars come together.

Pikeville, Ky. GEORGE EDWARDS.

Inquiries Of General Interest

Removing Gas Accumulated on Falls

Tendency of Gas to Rise Makes Removal from Falls Difficult—Bituminous Law (Penn.) Requires Boreholes Sunk from Surface—Will This Method Prove Effective in Exhaustive Ventilation?

HAVING seen many practical problems satisfactorily solved in *Coal Age*, I am writing to gain information in reference to one point of the Bituminous Mine Law, relating to the removal of gas that has accumulated on falls. The section of the law to which I refer reads as follows:

> In any mine where it has been found impracticable to remove explosive gas from the inaccessible top of a fall, it shall be the duty of the mine foreman to make this fact known at once, in writing, to the superintendent, who shall immediately report the same to the inspector, requestng him to make a prompt personal investigation. If the superintendent and the inspector are unable to devise means to have said explosive gas removed within a reasonable time, the inspector shall direct that a borehole, or boreholes, not less than 6 in. in diameter, be drilled from the surface to a high point on said falls, in order to give the gas an opening to escape to the surface.

Now, the mine in which I am employed is ventilated by an exhaust fan, which means that the mine pressure is below that of the atmosphere. I have been studying over this section of the law and it seems to me that it cannot apply to mines where the exhaust system of ventilation is employed for reasons hereafter set forth.

Clearly, in a mine ventilated by a blowing fan, the pressure in the mine being greater than that of the atmosphere outside, the gas accumulated above the fall would be forced out through the borehole and escape from the mine. But, where the mine is ventilated, as is ours, by an exhaust fan the reverse of this would take place, would it not?

The question I want to ask is, Will it be safe to try to remove a body of explosive gas from the top of a fall, in a mine ventilated on the exhaust system, according to the manner required by law? If this is not the method to be employed in such mines, kindly explain what means can be used to effectually remove the gas from high falls and keep them clear.

I shall greatly appreciate any information *Coal Age*, or its readers, can give on this question, as I am studying to prepare myself for the next examination and wish to be informed on the real meaning of the law. STUDENT.

Brownsville, Pa.

This correspondent has the correct idea in regard to the relative effect of the exhaust and blowing systems of ventilation. As he has stated, in the exhaust system, the mine is ventilated under a pressure below that of the atmosphere, while the blowing system causes a mine pressure above that of the atmosphere. The result is that when the fan is exhausting outside air will be drawn down the borehole into the mine. On the other hand, in the blowing system of ventilation, the gas and mine air will be forced out by the pressure and escape through the borehole into the outer atmosphere.

In our opinion, the section of the law quoted by the correspondent applies equally in each of these cases, as far as the movement of the gas from the falls is concerned. While in the blowing system of ventilation the gas will be forced out, at once, into the outside atmosphere and be of no further trouble in the mine; in the exhaust system the borehole will provide an entrance for a strong current of fresh air from the outside, which will blow the gas down from the falls and keep the latter clear from any further accumulation at that point.

The only difference in these two instances is that a mine using the exhaust system of ventilation will require a more ample air current in circulation, to dilute and carry away the gas generated and accumulated on the falls. In the blowing system of ventilation, on the other hand, inasmuch as the gas would escape from the mine at once, there would not be required as great a circulation of air in the mine, on that account, other conditions being the same.

Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

QUESTION—*On entering upon your duties as mine foreman, what would you consider to be your duty, in order to make a reputation for yourself and do justice to both employees and employer? State fully.*

ANSWER—By giving careful attention to the reading of the reports of the firebosses and seeing that any dangers they may have found are promptly removed and that the men are not permitted to enter such places, until the same are reported safe, the mine forman is fulfilling his first duties in the mine. By seeing that discipline is maintained and every man performing his work properly, the miners mining and loading their coal safely, and the drivers hauling the same to the bottom and bringing the needed supplies back into the mine, the foreman will earn a reputation for himself, in the eyes of his employer, in proportion to the way in which he is able to maintain the output of the mine at a reasonable cost. In justice to every employee in the mine, the duty of the mine foreman is to see that the working places are well ventilated and every requirement of the law fulfilled.

QUESTION—*In a mine employing a continuous air current for ventilation and the air-courses where the use of timber is necessary for support of the roof, how would you instruct your men in reference to working their rooms? Would you use the same method on the split system? Explain.*

ANSWER—The real meaning of this question is uncertain. However, assuming that, in the adoption of a continuous system of ventilation throughout the mine and in the endeavor to shorten the length of air travel as much as possible, the plan is adopted of carrying the air through rooms that have holed into each other, it will be necessary to give the men particular instructions, in reference to driving their rooms at a uniform width and timbering them securely to prevent their falling in before the next adjoining rooms have holed into each other and thus opened a new air-course for the current to travel. Unless these precautions are taken, in driving and timbering all rooms, a fall in any one room might cut off the circulation for the entire mine.

QUESTION—*Why is the use of black powder more dangerous, in blasting coal in dusty and gaseous mines, than permissible powder? Explain fully.*

ANSWER—Black powder produces much flame, which is projected from the hole when a shot is fired. On the other hand, the composition of permissible powder is designed to render it more or less flameless, by reason of the large proportion of nitrates used in its manufacture. Again, a smaller charge of permissible powder will do the same work as a much larger charge of black powder and produce a less concussion of the air, which will raise less dust and reduce the liability to explosion by reason of the dust suspended in the air.

QUESTION—*(a) What atmospheric conditions are indicated by the following instruments: Anemometer, barometer, hygrometer, thermometer, water gage? (b) In what way will variations of either instrument affect the others?*

ANSWER—(a) The anemometer is used to determine the velocity of the air current passing in a mine, while the water gage is used to determine the ventilating pressure. The only instruments used to indicate atmospheric conditions are the barometer, hygrometer and thermometer. The barometer indicates the pressure of the atmosphere, at the point of observation. The hygrometer determines the relative humidity of the atmosphere, or the percentage of saturation, due to the presence of moisture in the air. The thermometer makes known the temperature of the air.

(b) The hygrometer and thermometer, showing as they do the relative humidity and temperature of the air, indicate only local conditions and in no appreciable way affect the other instruments, except the reading of the barometer requires a slight correction for temperature, as indicated by the thermometer, if extreme accuracy is desired.

QUESTION—*An air-course is 5 ft. high and 7 ft. wide. An anemometer held near the top of the air-course shows a velocity of 900 ft. per min. When held near the center, the velocity is 1,000 ft. per min., while near the sides and the bottom the reading is only 850 ft. per min. What is the estimated amount of air traveling through this airway?*

ANSWER—There is no exact rule for determining the average velocity of the air current in an airway. At the best, the reading of an anemometer is only an approximate indication of the velocity of the passing air. In every case, the observer must use his judgment. It is more important to always employ the same method when taking measurements of the air. To be more accurate, allowance would have to be made for the space taken up by the observer's body, in the airway.

A common practice is to move the instrument about in the airway while taking an observation, giving say, 12 sec. to each position at the center and the top, bottom and sides of the airway; but never holding it nearer than from 8 to 12 in. from any bounding surface. The final reading of these five positions will give what may be assumed to be an average reading for a minute.

From the data given in this question, the full sectional area of the air-course is $5 \times 7 = 35$ sq.ft. Then, assuming nine tenths of this as the effective area for the velocity observed in the center of the airway, gives for the volume of air passing, in this case, $0.9 \times 35 \times 1{,}000 = 31{,}500$ cu.ft. per min.

QUESTION—*How must the power be increased to maintain a constant current of air in circulation, in mines where the airways are continually increasing in length?*

ANSWER—Assuming there is no change in the mine, except that due to the lengthening of the air-courses, the power required to maintain a constant flow of air, or a constant velocity in the airways, must vary as the increasing length of the same. For example, if 10 hp. produces a given circulation in 10,000 ft. of airway, 15 hp. will be required to produce the same circulation when the airways have increased to 15,000 ft.; and 20 hp. will be required when the length of the air-courses has reached 20,000 ft.

QUESTION—*What will be the area of fire grate of a furnace that is to supply 50,000 cu.ft. of air per minute, against a 2-in. water gage, when the depth of the furnace shaft is 200 ft.?*

ANSWER—First, find the horsepower on the air required to pass 50,000 cu.ft. of air per min., against a 2-in. water gage, which is $(50{,}000 \times 2 \times 5.2) \div 33{,}000 = 15.75$ hp.

Now, calling the depth of the shaft D, in feet, and the horsepower on the air H, the area (A) of the grate surface required is found by the formula

$$A = \frac{34H}{\sqrt{D}} = \frac{34 \times 15.75}{\sqrt{200}} =$$

37.86, say 38 sq.ft.

QUESTION—*With furnace ventilation, how much more air will pass in a shaft 300 ft. deep than in one 50 ft. deep, other things being equal?*

ANSWER—For the same average temperatures of the upcast and downcast shafts and the same barometric pressure, the mine ventilating pressure varies with the depth of the shaft; and, since the quantity of air in circulation varies as the square root of the pressure, the quantity of air in circulation will vary as the square root of the depth of the shaft. In other words, the quantity ratio is equal to the square root of the depth ratio, which is 300 : 50 or 6. Therefore, in this case, the quantity ratio is $\sqrt{6} = 2.45$. That is to say, under the same conditions, a 300-ft. shaft will pass 2.45 times the quantity of air that will be passed by a 50-ft. shaft.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THROUGH its employment service the U. S. Department of Labor announces that as a result of its industrial survey for the month ended Jan. 31, 1922, the following classifications showed increases in employment: Food and kindred products; leather and finished products; paper and printing; liquor and beverages; chemicals and allied products; metals and metal products other than iron and steel; vehicles for land transportation; and miscellaneous industries. The industries which show a decrease are textiles and their products; iron and steel and their products; lumber and its manufacture; stone, clay, and glass products; tobacco manufactures; and railroad repair shops.

The survey is based on figures taken from the larger industrial payrolls of the country. The statistics on which its computations are based are gathered each month by the department's special agents in 65 principal industrial centers. In all 1,428 firms, each usually employing more than 500 workers, or a total of 1,600,000, are comprised in the survey. On Jan. 31 these 1,428 firms had 63,400 more employees on their payrolls than they carried on Dec. 31, an increase of 4.2 per cent.

Employment conditions fail to give any indication of the substantial improvement in business activities predicted for January. The figures last month were obtained during inventory period, particularly those in the automotive industry. The slight change in the totals of all the groups shows a downward trend. Increase in employment in metal products other than iron and steel, and miscellaneous industries, is the encouraging feature of this month's survey.

Reports from 231 of the principal centers show no general improvement in employment conditions. Industry is hardly holding the gains made during the past four months, and is, therefore, absorbing but few, if any, of the workers released from seasonal activities and the unemployed caused by the usual climatic conditions of this season of the year.

The feeling that there will be a decided change for the better by early spring is manifested by every section of the country, and seems to be based on real evidence of prosperity and not mere optimism.

South Central Region Not Hopeful

Actual payroll data of 332 industrial concerns in Kentucky, Tennessee, Alabama and Mississippi employing 105,244 show a net increase for the month of ¼ of 1 per cent. Seventy-five per cent of the textile mills are running full time, 20 per cent part time and 5 per cent shut down; 50 per cent report outlook for improved business unsatisfactory. Fifty per cent of the lumber mills are running full time, 25 per cent part time or with reduced forces and 25 per cent shut down. About 50 per cent report outlook for improved business unsatisfactory. Three hundred concerns representing most all of the 14 groups of industries show that 65 per cent are running full time, 25 per cent part time or with reduced forces and 10 per cent shut down; 40 per cent report outlook for improved business unsatisfactory.

INDUSTRIES REPORTING AN INCREASE IN EMPLOYMENT IN JANUARY, 1922

Industries	Amt. of Inc.	P.c. Inc.	Weight*
Vehicles for land transportation	63,204	58.4	11
Leather and its finished products	2,080	3.7	3.7
Metals and metal products	2,254	2.8	5.2
Paper and printing	132	2.6	3.24
Food and kindred products	2,319	1.8	8.45
Miscellaneous	4,286	1.7	16.5
Liquors and beverages	10	1.2	0.05
Chemicals and allied products	598	0.8	4.7
Total	74,802		

INDUSTRIES REPORTING A DECREASE IN EMPLOYMENT IN JANUARY, 1922

Industries	Amt. of Dec	P.c. Dec.	Weight*
Railroad repair shops	4,286	3.9	3.8
Tobacco manufacture	903	2.6	1.9
Stone, clay and glass products	149	1	0.9
Lumber and its manufacture	74	0.3	1.[illegible]
Textiles and their products	949	0.8	17.[illegible]
Iron and steel products	7,130	0.21	21.4
Total	13,301		

*Per cent employed Jan. 31 to total reported employed in 14 groups.

Mid-Atlantic Conditions Improved

Industrial revival from the point of extreme depression has not been marked in the Middle Atlantic district during the first month of 1922. Many industries have shown a slight increase in operations, particularly the building industry. Some industries show a slight decrease in operations, attributable in great measure to the usual dullness during the inventory period. Many industries have made slight gains since the general shutdown during inventory and there are many reports with good signs of increased activity. The consensus of opinion forecasts betterment in the near future with gradual improvement in most lines. Idleness has been greatly reduced in certain sections.

South Atlantic District Gloomy

Judging from small firms reports in 18 cities in the South Atlantic district the month from Dec. 15 to Jan. 15 shows a drop in employment. Textile mills show discouragement as to the outlook of business in their lines. Most of the mills are running with fairly full forces, but orders are not being received to a sufficient extent to warrant much optimism as to the outlook. The lumber situation throughout the South is unsatisfactory. Five hundred and ninety textile mills in Virginia, North Carolina, South Carolina and Georgia report 151,564 employees on their payrolls Jan. 15, compared with 151,818 on Dec. 15, a decrease of 254.

Manufacturing Gains in Midwest

The starting of the new year seems to have brought about a slow but sure increase in the amount of manufacturing and a general resumption of activity in all building trades lines in Michigan. The furniture industry is putting large numbers of skilled workmen at work. The automobile industry is estimated as working 60 per cent of normal, with continued feeling that conditions will improve gradually. One railroad shop which had been working short time opened at full capacity Feb. 1 with full crew.

Outlook Bright in New England

Building reports for December in the six New England States show an increase over the previous month of $8,070,500. The value of December contracts was $26,474,100, of which $17,358,700 was for residential buildings. General opinion is that periods of increased business and industrial activity will prevail. Textile mills at present time are operating at nearly normal capacity. Wool products look bright for the future. Shoes and leather show a slight increase.

United Mine Workers Are Riding for a Hard Fall, Is Belief in Washington

By Paul Wooton

Washington Correspondent of *Coal Age*

THERE has been a pause during the last week in the wordy controversy in government circles revolving around the labor situation in the coal industry. The adherents of each of the conflicting interests apparently are marking time waiting to see what the miners do at Indianapolis. Speculation continues as to the possible meaning of John L. Lewis' appeal. Some think it is a bid for financial support. Others are of the opinion that he simply wants to make the record clear that he has left no stone unturned in furthering the cause of the mine workers.

Preparations on the part of British exporters to take advantage of the strike situation to ship coal to north Atlantic ports has raised the question as to the possible attitude of the British miners. Since American miners made no protest during the British strike when the United States was exporting 2,000,000 tons of coal a month and in view of the existing British labor situation there is a widespread opinion in Washington that there will be no interference from that source with the shipment of British coal to the United States. It is estimated that 2,000,000 tons is the maximum monthly rate that such shipments could attain.

With the increasing certainty that there will be a strike, closer scrutiny has been given to the actual output that can be expected from the non-union fields. From the non-union territory proper it is probable that the shipments at the outset cannot exceed 4,500,000 tons weekly. This is assuming that there will be no interference with its distribution. Since it is taken for granted that some of the outlying fields will be back at work soon after the strike is called, an ultimate output of 6,000,000 tons can be attained, in the opinion of disinterested coal specialists. Their estimates of the needs of the country, however, exceed those of the operators. They believe that nearly 9,000,000 tons will be required to run the country and keep up export shipments. This will mean that some 3,000,000 tons weekly must be taken from stocks.

Even if there should be no additions to the 55,000,000 tons now estimated to be in stock, a number of weeks must pass before any acute shortage is likely to develop. To assume that stocks will be materially increased is looked upon in government circles as counting chickens before they are hatched, but since advice is coming from several quarters urging consumers not to be frightened into paying increased prices, as the strike will be of short duration, it is possible that the addition to stocks will not be as great as is generally expected. Practically all the reliable agencies are urging the accumulation of as large stocks as possible prior to April 1.

It is pointed out that figures as to coal stocks are deceptive in that stocks are inequitably held and, like oil in a pipe line, there are some 20,000,000 tons entering into the stock total which do not enter into actual consumption. The opinion is expressed in government circles that coal operators in the face of a crisis of this kind can do much toward effecting equitable distribution of the coal they ship.

In calculating stocks on hand attention is called to the fact that there are 1,017,000 tons of byproduct coke on hand. Since these plants are in the vicinity of large consuming centers, they could be relied upon to furnish a supply of domestic fuel equivalent to one week's production of anthracite.

There is some reason to think that the American Federation of Labor is not highly pleased with the way the coal labor situation is being handled. The belief is stronger than ever that the United Mine Workers are riding for a hard fall.

To Investigate Wages and Cost of Living Among Anthracite Mine Workers

WAGES and the cost of living in the anthracite industry, it is reported, are being studied by the National Industrial Conference Board, the headquarters of which is at 10 East 39th St., New York City. The board hopes to obtain data from practically all anthracite producers, and it is said that a field investigation of living costs in six representative cities and towns is now under way.

As the board has already completed an inquiry into wages in twenty-four manufacturing industries and is reported to be engaged in an examination of wages and working conditions on the railroads, it is supposed that the board felt that data from the anthracite industry would prove of general interest for purposes of comparison.

Increased Coal Shipments Cause Gain of 5,453 in Freight Car Loadings

DUE PRINCIPALLY to increased shipments of coal, loading of revenue freight totaled 743,728 cars during the week ended Jan. 28, compared with 738,275 cars during the previous week, or an increase of 5,453 cars, according to reports by the American Railway Association. This also was an increase of 42,123 cars compared with the corresponding week in 1921, but a decrease of 59,604 cars compared with the corresponding week in 1920.

Coal shipments during the week of Jan. 28 totaled 180,966 cars, which was an increase of 16,875 cars over the week before and 17,536 cars in excess of the corresponding week in 1921. It was, however, 7,949 cars below the number shipped during the same week in 1920. Coke shipments also increased 235 cars over the week, before which brought the total to 7,502.

Reports from the railroads of the country show that 489,842 freight cars were idle on Jan. 31, compared with 555,353 on Jan. 23, or a reduction of 65,511. Surplus coal cars numbered 145,913, a reduction of 38,086 within the week. A reduction of 246 cars, which brought the total to 4,296, was reported for coke cars.

State of Alabama Offers to Buy Coal Mines To Provide Work for Idle Convicts

A TENTATIVE offer to buy and operate the properties of the Montevallo Mining Co., recently placed in the hands of a receiver, has been made by Governor Kilby and the State Board of Control and Economy, in charge of the care and working of Alabama convicts. Since the receivership the convict labor used at the company's mine has been replaced by free labor and the state finds several hundred convicts on its hands with nothing to do. With the object of providing employment for these prisoners and others from time to time the state proposes to buy the property of the bankrupt and operate it.

The offer provides that the state assume all liabilities of the company, aggregating $574,048.47 as listed, and pay $84,551.53 in cash, which represents the difference between liabilities and assets as scheduled. The inability of the Montevallo company to relieve itself of the burden of steady employment for the convicts regardless of the market conditions which prohibited disposition of the output on such a scale is alleged to be largely responsible for the failure of the company, which now has 32,000 tons of high-grade domestic coal stocked at the mines.

Despite War Law, Government Must Pay Market Price for Requisitioned Coal

THAT the United States Government must pay the market price for coal requisitioned by it, war laws to the contrary notwithstanding, was in effect the ruling handed down by the U. S. Circuit Court of Appeals sitting in Cincinnati on Feb. 7, when a decision was announced on the appeal of the government against the C. G. Blake Co., a Cincinnati concern. The company had won a verdict in a trial before Judge John Weld Peck in the district court and was awarded several thousands of dollars as a difference between the market value of the coal and the allowance made by the Navy Department under section 10 of the Lever Act. The record in the case shows that the value of the coal in the open market at the time it was taken by the government was $5.60 a ton, while the navy fixed the price at $4. Under the law the coal company accepted the three-quarters of the value fixed by the navy and then sued for the difference between that and the market price.

The same company has filed another suit seeking approximately $31,000 for coal that was taken over between October and December, 1920—a difference between the government allowance of $4 a ton and the company's valuation, ranging from $5.60 to $13.70 a ton. The point at issue in this case is whether the inland or the tidewater price for the coal should rule. It is the argument of the company's attorneys that the government should pay as much for the coal that it seized as would have been paid by foreign governments, corporations or others who were in keen competition at tide for coal at the time.

After hearing all of the witnesses and the argument of counsel Judge Peck took the case under advisement.

Suggests That Premium and Penalty Clauses In Contracts Be Limited to Essentials

IF the purchaser of coal wishes to buy on a premium and penalty basis, the same should be confined to a few essential items, such as the ash, heat value and fusing point of ash, in the opinion of H. L. Ogden, of Boston, Mass., representative of the National Association of Purchasing Agents on the committee on coal of the American Society for Testing Materials.

As told in *Coal Age* of Jan. 26, the sub-committee has rejected a contract form providing for the purchase of coal based on analysis. Its recommendations are: "That every plant cannot buy under the same specification and to determine what coals will work to the best advantage under your own peculiar conditions the different coals available in the territory where the plant is located be given a boiler test to determine which are best adapted to your use.

"When these coals have been determined, analyze them and draw up a contract on the basis of this analysis, naming the mine or mines from which coal is to be shipped.

"If a premium and penalty clause is included in the contract it should be based on the ash content of the coal, and the amount of the premium and penalty should be determined in each individual case on the actual cost of coal delivered and the expense of handling the excess ash at the plant."

In addition to the suggestions relating to the premium and penalty basis Mr. Ogden's report says that the amount of penalty and premium should be based on the cost to the purchaser of using the poorer quality of coal and that the premium to the operator should be based on the saving from use of the better quality. This, he believes, would insure uniform preparation of coal by the shipper.

Mr. Ogden believes that this is the only manner in which a satisfactory contract of this nature could be made and that the purchaser and the shipper would have to agree on the premium and penalty in each individual case. He also believes a rider clause might be attached to the standard coal contract of the association to meet the individual case.

The suggested rider provides for a maximum and minimum percentage of volatile, fixed carbon, ash, sulphur, moisture, thermal units and fusing temperature of ash. Succeeding paragraphs provide for the penalties, which are to be agreed upon, in case the coal does not come up to the analysis agreed upon, and it also provides that should the coal delivered fail to analyze equal to analysis specified or should the shipper fail to ship from the mine or mines specified, without the written consent of the buyer, the latter may cancel the contract should he so elect.

The following resolution was unanimously adopted by the committee:

> It is the sense of the committee that when parties can agree in sampling and analyses, quality should be specified, based on analysis of samples taken from previous shipments. Specifications should state the mine or mines from which coal is to be shipped. The producer should, barring providential clauses, bind himself to take and pay for the coal if it is shipped as per contract with regard to quality and quantity. Any bonus and penalty should be so arranged that the user of the coal is indemnified for loss due to the quality being below specification and the operator is compensated for any gain which the user makes due to the coal being better than specifications.

Mr. Ogden's report is now before the National Fuel Council of the National Association of Purchasing Agents for consideration.

West Virginia Operators Meet in New York

ABOUT FIFTY members of the West Virginia Coal Association met early last week in the Waldorf-Astoria and discussed the threatened coal strike. The meeting adjourned on Feb. 8 but the Smokeless Coal Operators Association of West Virginia continued the meeting Feb. 9. L. G. Bradley, president of the larger association, said that "the unorganized fields produced in the 1919 strike about 30 per cent of the country's maximum tonnage. The country is now consuming about 80 per cent of the normal output, the unorganized fields shipping over half of that tonnage."

In the New River field, according to Mr. Bradley, 80 out of 115 companies are working on a non-union basis and in the Kanawha field 23 out of 165. The smokeless operators, under the chairmanship of E. E. White, concluded their sessions with a lunch at the Waldorf-Astoria at which R. Bryan, R. D. Hall, Senator Baumgartner, A. J. King, E. J. McQuail and J. J. Tierney made short addresses.

Explosives May Not Be Used at Cassidy

THE Department of Mines, Victoria, B. C., recently prohibited the use of explosives in the Cassidy mine of the Granby Consolidated Mining, Smelting & Power Co., the reason given being that it constituted a menace to the miners. The order followed reports of blowouts of methane and coal dust, a number of these occurrences taking place at intervals over a period of some months. In the opinion of the men affected the prohibition is unduly severe and objection is taken chiefly because it makes the work of the miner harder and, for those working on contract, less remunerative. William Sloan, Minister of Mines, has promised to consider the matter and in the meantime has forwarded a sample of coal from the mine in question to the U. S. Bureau of Mines, Washington, D. C., in order that tests may be made to ascertain the explosive range of the coal dust.

Scotts Run to Lower Wages 30 Per Cent

ON APRIL 1 the wages of mine workers in the Scotts Run field of Monongalia County, West Virginia, will be reduced 30 per cent, the Monongahela Coal Association at a meeting terminated on Feb. 4 having decided to announce that wage cut. The conferees also announced that the check-off would be eliminated. The members of the association operate 65 mines along the Monongahela and Morgantown & Wheeling railroads in West Virginia.

In announcing the reduction the association issued a statement in the course of which it was said that "The leaders of the mine workers have apparently shut their eyes to the wage adjustments that have been made in other industries. They have refused to recognize these wage changes and are unwilling to bear their share of the burden of deflation."

Hoover Queries Form Effective Trade-Association Code

Eleven Questions on Lawful Activities Receive Affirmative Answer by Attorney General—Collection of Data on Trade and Economic Conditions, If Revealed to General Public, Declared Harmless

QUESTIONS arising out of the activities of trade associations are of such complex legal character that the Department of Commerce and the Department of Justice have given out for publication the entire correspondence on the subject, to which the departments have given several months of study and investigation.

It is likely that a series of conferences between Herbert Hoover, Secretary of Commerce, and representatives of the principal open-price associations and trade organizations of the country will be begun soon for the purpose of arranging for the compilation and publication of trade statistics in accordance with the recent decision of the Supreme Court in the Hardwood case and the correspondence mentioned.

MR. HOOVER'S LETTER COVERS ALL ANGLES

The following letter from Mr. Hoover to Harry M. Daugherty, Attorney-General, under date of Feb. 3, 1922, requires no explaining:

"The situation regarding the activities of legitimate trade associations is more disturbing now than at any time since we first discussed the matter, and since Mr. Lamb was advised by Colonel Goff and Mr. Fowler that it was your desire that I present an informal, inter-departmental inquiry regarding the present status of the law relating to legitimate trade associations and the extent that they may engage in legitimate co-operative activities, I have made a further survey of the matter, and the questions hereinafter presented seem to me to be vital to trade associations based on present information secured through recent investigation.

"It may not be out of place to call your attention to the organic act which created the Department of Commerce, which imposed upon the department the duty 'to foster, promote, and develop the foreign and domestic commerce, the mining, manufacturing, shipping, and fishery industries, and the transportation facilities of the United States.' In obeying the commands of the statute, it seemed to me that the department should employ all available legal means to get into the closest possible touch with industry in all its forms and secure the best information possible regarding the needs and necessities of trade and commerce.

"If the department has to help, aid, and assist industry, it must, of course, be conversant with the facts and conditions influencing the carrying on of trade. The existence of a large number of trade associations being well known prompted me to make inquiry regarding their forms of organization and the functions they were performing to ascertain whether or not they could be utilized as a means for securing trade information that would properly aid the department in performing its duties. My inquiry into the affairs of trade associations was not with the idea of creating a new scheme for carrying on business, but solely for the purpose of ascertaining whether or not they could properly be utilized in furnishing information that would not only be helpful to the department and to the commercial world but to the public generally, always keeping in mind that whatever activities were carried on by such associations, they should of necessity be within the terms of existing law.

"In the course of my inquiry I discovered that certain trade associations were involved in litigation which questioned the legality of their performances, and by reason of the litigation, there was much doubt and confusion regarding the legal limits within which trade associations could properly operate. This situation seemed to call for conferences with your department, which you have graciously afforded, and although no definite determination has heretofore been reached regarding the policy to be pursued, I realize the difficulties that confront you in attempting to reach a proper conclusion, and while a public announcement from you would have been most helpful to all, I most heartily acquiesce in your suggestion that the matter be presented as an informal, interdepartmental inquiry for my guidance in performing the duties imposed upon me by the organic act creating this department.

"So much has been said in the various conferences, coupled with lapse of time, in order to obviate excusable failures in memory as to the matters that have heretofore been discussed and to make clear the position and views of this department, I desire to offer some preliminary observations regarding trade associations before asking the specific questions heretofore set forth in various informal memoranda and upon which I desire the informal expression of your views.

"Commercial progress in industry has always been measured by the advance in knowledge of those engaged in industry. It is impossible for men to acquire or secure all possible knowledge at one time. Its acquisition is a growth resulting from continuous, intelligent inquiry. The knowledge of an industry that is necessary and essential to its success must embrace all facts and circumstances that will in any way influence that industry. These facts and circumstances must include economic conditions as well as scientific facts to the extent that science is called into play in its operation and all commercial conditions that make for efficient production, merchandising and distribution. No one will dispute the foregoing statements; they are fundamental and necessary to the life of trade and commerce.

DIFFICULT TO DETERMINE MEANS AND METHODS

"The difficulty seems to lie in the determination of the means and methods that may be adopted to secure this necessary information. Little, if any, trouble is experienced in securing the admission that an individual may secure knowledge of these facts by any means that would not constitute an individual crime, and that he may use the information in such manner as his best judgment may tell him will bring him the greatest benefit.

"But when two individuals engaged in the same line of industry undertake to provide a means for securing facts necessary and essential to the economic and efficient conduct of their respective organizations, this form of endeavor seems to at once assume an aspect of difficulty that, in my judgment, is in no way justified by a proper consideration of the underlying necessities therefor.

"The individual sets up some form of instrumentality to secure the information without which, in the management of his business, he would be groping in the dark. His competitor across the street does the same thing, and each, securing his information in his own way, uses it as he sees fit, and the action of either one has not offended the majesty of the law. Yet, if the two seek to joint the instrumentality each has used for information purposes and the same information is received through one instrumentality and the information given to each and it is used in the same way that it was before, it is suggested that the collective activity in the use of the consolidated instrumentality should not be permitted because of the greater ease and facility thereby afforded for the two individuals to make improper use of the information so acquired. In other words, the objection does not go to the instrumentality, but to the abuse of the information that may be secured through the collective means.

"The principle is the same whether two or two hundred join together in securing the information.

"No form of legislation has ever yet been devised, nor has man, with all of his genius for invention, ever been able to devise a rule or regulation that would prevent men from committing crimes if they are so minded. The best that can be done is to forbid the doing of certain acts or to command the doing of others, prescribing proper punishments in the case of the commission on the one hand and the omission on the other; and when legislation takes that form, rules and regulations and administrative constructions which have for their objective the making of the prohibited thing more difficult will always include within their terms the law-abiding citizen as well as the prospective criminal.

"We have had criminals since the beginning of time, and human nature cannot be changed by legislation. The criminally inclined represent a small minority, and it may be said in a general way that, excepting offenses against persons and property, most of the criminal statutes regulating trade and commerce and forbidding acts that seem against sound public policy have been made necessary for the control of the minority. None of these statutes, however, has undertaken to prevent the doing of a thing that would result in benefit to the public, but the restriction has been against the doing of the thing in an unlawful way.

"These statutes have not condemned lawful institutions or instrumentalities for the carrying on of commerce merely because someone might possibly abuse their use. The laws have condemned the abuse, and punishments have been prescribed for those who may be found guilty of the abuse. Therefore, the fact that the minority may be known to violate given laws does not establish a principle that the primary means lawful in itself, which they have adopted for the purpose of performing the unlawful acts, should be entirely abolished and its use forbidden by law-abiding citizens. Each unlawful use of the means is merely an individual case of the violation of a law.

"Trade associations have been in existence for many years. The great majority are legitimate, both in form of organization and in activity. The minority, while lawfully organized under articles expressing lawful purposes, may engage in activities that are evidence of purpose contrary to and outside of the declared purposes in the articles of organization.

"Again, a trade association may have lawful form of organization and the activities of its officers may be clearly within the purposes declared in the association charter, and yet members of the organization may, by unlawful confederation, use the information lawfully secured for unlaw-

CODE OF PRACTICE GOVERNING TRADE ASSOCIATIONS

Secretary Hoover's Eleven Questions, Which Elicited an Affirmative Reply from Attorney-General Daugherty

(1) May a trade association provide for its members a standard or uniform system of cost accounting and recommend its use, provided that the costs so arrived at by the uniform method are not furnished by the members to each other or by the members for the association and by the latter to the individual members?

(2) May a trade association advocate and provide for uniformity in the use of trade phrases and trade names by its respective members for the purpose of ending confusion in trade expressions and for harmony of construction as to the meaning of trade phrases, names, and terms?

(3) May a trade association, in co-operation with its members, advocate and provide for the standardization of quality and grades of product of such members, to the end that the buying public may know what it is to receive when a particular grade or quality is specified; and may such association, after standardizing quality and grade, provide standard form of contract for the purpose of correctly designating the standards of quality and grades of product; and may it standardize technical and scientific terms, its processes in production, and its machinery; and may the association co-operate with its members in determining means for the elimination of wasteful processes in production and distribution and for the raising of ethical standards in trade for the prevention of dishonest practices?

(4) May a trade association collect credit information as to the financial responsibility, business reputation and standing of those using the products of the industry; and may the association furnish such information to individual members upon request therefor, provided such information is not used by the association or the members for the purpose of unlawfully establishing so-called "blacklists"?

(5) May a trade association arrange for the handling of the insurance of its members, including fire, industrial, indemnity or group insurance? In other words, can the members of an industry, through the agency of a trade association, arrange for or place all of the insurance of the members?

(6) May a trade association, in co-operation with its members, engage in co-operative advertising for the promotion of trade of the members of that association engaged in the particular industry; and may the association engage in such form of promotion by furnishing trade labels, designs and trade marks for the use of its individual members?

(7) May a trade association, for and in behalf of its members, engage in the promotion of welfare work in the plants or organizations of its members, which welfare work includes sick benefits and unemployment insurance for employees, uniform arrangements for apprenticeship in trade education, the prevention of accidents and the establishment of an employment department or bureau for co-operation with employees?

(8) May a trade association, in co-operation with its members and acting for and in behalf of its members, handle all legislative questions that may affect the particular industry, regarding factories, trades, tariff, taxes, transportation, employers' liability and workmen's compensation, as well as the handling of rate litigation and railroad transportation questions?

(9) May a trade association, in co-operation with its members and acting for and in their behalf, undertake the promotion of closer relations between the particular industry and the federal and the state departments of government which may have administration of laws affecting the particular industry in any form?

(10) A. May a trade association collect statistics from each member showing his volume of production, his capacity to produce, the wages paid, the consumption of his product in domestic or foreign trade, and his distribution thereof, specifying the volume of distribution by districts, together with his stock, wholesale or retail?

B. And may such trade association, on receipt of the individual reports of each member, compile the information in each report into a consolidated statement which shows the total volume of production of the membership, its capacity to produce by districts of production, which, in some instances, include a state or less area, the wages by districts of production, the consumption in foreign or domestic trade by districts, the volume of distribution by districts, and the stocks on hand, wholesale and retail, by districts?

C. And if, after compiling the information as aforesaid, the information received from the members as well as the combined information is not given by the association to any other person, may it then file the combined statement with the Secretary of Commerce for distribution by him to the members of the association through the public press or otherwise and to the public generally and to all persons who may be in any way interested in the product of the industry, it being understood that the individual reports for the members should cover either weekly, monthly, quarterly or longer periods, as may be deemed desirable by the members, and, when a period is adopted, the report for each member shall cover that period, and the combined report shall be for that period?

(11) A. May a trade association, at the time it collects the production and distribution statistics above outlined, at the same time have its members report the prices they have received for the products they have sold during the period taken, specifying the volume of each grade, brand, size, style or quality, as the case may be, and the price received for the volume so sold in each of the respective districts where the product is sold?

B. And may the association, without making known to any person the individual price reports of any member, consolidate all of the reports into one, and show the average price received for the total volume of each grade, brand, size, style or quality, as the case may be, distributed in each district covered by the distribution statistics for the period covered by each individual report?

C. And may the association, after making such compilation, send the compiled report as to average price, as aforesaid, to the Secretary of Commerce, to be by him distributed to the public and to any or all persons who may be interested in the particular industry making the report?

In order to avoid repeating this question in connection with each one of the activities outlined in the eleven preceding questions, may trade associations engage in any or all of the activities named without violating the law, provided the organization and the activity engaged in are not for the purpose of hiding or concealing some agreement, contract, etc., to actually restrain trade of otherwise violate the anti-trust laws?

ful purposes. It may, therefore, truthfully be said that the line dividing the good association and the bad, the proper activity from the improper one, and the lawful activities of the officers of an association from the unlawful acts of the membership, cannot be determined in every instance with singular ease. It is my belief, however, that it is more easy to determine the forms of organizations and activities that are generally recognized as good than to determine in advance those that may be bad, because in the latter instance the peculiar facts relating to each association the subject of inquiry may determine whether the organization or its members are operating in violation of law.

"It is with much earnestness that I claim there is propriety, generally speaking, in trade associations. Their lawful field of endeavor is large, and their activities work for promotion and advancement of the public welfare and for progressive economic organization. In making this statement I am not unmindful of the fact that the impression exists with a small minority that individual prohibited acts may be accomplished by organization under the disguise of a trade association. However, to make my position clear regarding the trade associations the existence of which I advocate, I desire to say that I have always taken the view that no body of men could combine in the form of a trade organization and do any act or thing forbidden by law if they were undertaken by them outside of a trade organization.

"The character of trade organization the existence of which should be preserved is one that carries lawful purposes only in its articles of association; its activities must be in harmony with its declared purposes. The articles of association, with their lawful, declared purposes, must not be used as a mask to hide unlawful purposes. In other words, the organization cannot be used to conceal or disguise any contract, combination, conspiracy, agreement or understanding, secret or otherwise, on the part of the officers of the organization or on the part of the membership or any part thereof to engage in activities in restraint of trade or otherwise in violation of the anti-trust laws.

MUCH DATA RESTRICTED TO ASSOCIATION MEMBERS

"There has been much information collected by legitimate trade associations in which the general public has no interest whatsoever, yet information of this class has always been freely offered to the daily and the trade press, as well as to any governmental agency that might desire the information as a matter of statistical record. On the other hand, certain statistical data are collected by trade organizations that would be of vast value to the public generally if published in practical, available form.

"Many of the trade associations securing and disseminating the statistical data mentioned have restricted the same to its membership, while others have undertaken to give the same to the public through the daily and the trade press concurrently with its members. The trade associations of the latter class are in the minority.

"Information lawfully secured regarding trade and economic conditions made public for the information of everyone cannot be harmful. Information secured solely for the benefit of members and of a character that puts the membership, by reason of the information, in a position of advantage as compared with the public without such information cannot be sanctioned by sound public policy. The act of securing the information and the use of it by the members of a particular organization may be perfectly lawful in itself, but it is my belief that good morals and a sense of fair dealing require the giving of the information secured in this collective manner to the public generally, to the end that all persons engaged in commercial transactions involving the information in question will be on an even footing.

"The activities of trade associations that have received the greatest criticism involve the collection of statistics relating to volume of production, capacity to produce by districts of production, wages, consumption of products in domestic and foreign trade, distribution thereof including volume of distribution by districts, together with figures as to stocks on hand, wholesale and retail, by districts, coupled with information as to price, either in the form of individual reports of each member distributed to every other member or the individual prices reported to the association and by the latter compiled and averaged by districts for certain specified periods.

"If information regarding production, capacity and distribution by districts, with average prices for grades, brands, sizes, styles or qualities sold in the respective districts for specified periods of time could be given to the public at the same time that such information is available to the members of an association, in my judgment, great public good would result. With this information available, everyone dealing in the products of a given industry, whether buyer or seller, would have the same information regarding conditions and, in dealing with one another, would have knowledge of the same facts upon which to form their judgments as to the proper course to pursue.

"A majority of the associations collecting data of the nature indicated have distributed same only to members of the association, while others have undertaken to give the information to the public through the daily and trade papers. Publication of the information by these associations in the daily press has not been general, and its availability to the public has been largely through the medium of trade papers, and through the daily press to the extent that the latter may have been utilized. When published through trade papers this information should be released to members only after such publication

"It should be borne in mind that the criticism aimed at this form of activity has not involved the instrumentality for securing it or the subject matter of the information, but has been directed to the use or possible use that might be made of the information and the fact that no means existed for distributing the information to the public at the same time that it was received by the members of the association. These observations likewise apply to the criticisms directed to the furnishing of average prices of given commodities according to grade, size, brand, or quality by districts for specified periods of time, based on past and closed transactions.

"With these observations, which have been extended at greater length than I intended, I desire the informal expression of your views as to the following activities on the part of trade associations and their members wherein neither the form of the association nor the activity, which appear perfectly fair and lawful on the surface, is used to hide or conceal some contract, combination, conspiracy, agreement or understanding, secret or otherwise, on the part of the association, the membership, or any part thereof to actually restrain trade or otherwise violate the Sherman Act. [Then follow the eleven questions enclosed in a border on page 298.]

"As stated in the beginning, I do not ask you to express your views in a formal opinion, but it is my hope that you may see your way clear to give me the advice that will enable me to adopt the proper administrative action in undertaking the duties imposed upon the Secretary of Commerce by the organic art creating the department. It is unnecessary for me to say that the general, unsettled condition regarding the proper provinces of trade associations justifies as early a reply to these inquiries as your other numerous official duties will permit."

ATTORNEY-GENERAL DAUGHERTY'S OPINION

Attorney-General Daugherty's reply, under date of Feb. 8, was as follows:

"Your communication of the 3rd instant relating to the practices in which trade associations may lawfully engage was received. I recognize the force of your able discussion of the subject, and after careful consideration of the several activities which you suggest can be exercised lawfully, I beg to say:

"With reference to the first paragraph, there is no apparent objection to a standard system of cost accounting, but I think associations should be warned to guard against uniform cost as to any item of expense. For illustration, a strong effort has been made by some lumber associations to take as a basis for estimating costs of production a uniform charge for stumpage. Of course the cost of the timber in the tree to the different manufacturers who own their timber in the woods greatly varies; and as to each it should be charged at its actual cost. It is as clearly a violation of the law to agree upon the cost of an item that constitutes a substantial part of the total cost price when its cost actually varies, as to agree upon the sales price, because the sales price is substantially affected by such agreement. It has been ascertained that the members of one association go so far as to fix a uniform cost price, leaving to each member to determine what per cent profit he will add, thus eliminating entirely competition in so far as affected by the cost of production.

"Furthermore, I have serious doubts about the advisability of the latter part of the sixth paragraph. I can see no objection to co-operative advertising designed to extend the markets of the particular article produced or handled by the members of an association, but when the several producers or dealers use uniform trade labels, designs and trade marks it seems to me the inevitable result would be a uniformity of price. Where two competing articles are advertised in precisely the same way and bear exactly the same label or trade mark, it certainly would be difficult for one to be sold at a higher price than the other, although its quality may be superior. In a way this is illustrated in the cement industry. There a standard of quality has been adopted. That is, it is necessary for all cement to comply with a certain standard, but in practice no manufacturer undertakes to make, or at least no one advertises that he does make, a grade of cement superior to that standard. The result is that there is no competition in the sale of cement so far as quality is concerned. It seems to me therefore that it would be well to eliminate the latter clause in paragraph six, to wit, 'and may the association engage in such form of promotion by furnishing trade labels, designs and trade marks for the use of its individual members?'

"I can now see nothing illegal in the exercise of the other activities mentioned, *provided always* that whatever is done is not used as a scheme or device to curtail production or enhance prices, and does not have the effect of suppressing competition. It is impossible to determine in advance just what the effect of a plan when put into actual operation may be. This is especially true with reference to trade associations whose members are vitally interested in advancing or, as they term it, stabilizing prices, and who through the medium of the associations are brought into personal contact with each other. Therefore the expression of the view that the things enumerated by you, with the exceptions stated, may be done lawfully is only tentative; and if in the actual practice of any of them it shall develop that competition is suppressed or prices are materially enhanced, this department must treat such a practice as it treats any other one which is violative of the Anti-Trust Act."

MR. HOOVER CLEARS UP A MISCONCEPTION

Under date of Feb. 9 Secretary Hoover wrote as follows to Mr. Daugherty:

"Your observations regarding the last clause in question (6) in my letter are wholly sound, based on the language of that clause. It was not, however, my idea that each constituent member of a trade association would use a community trade mark on his product, i.e., the same trade mark that was used by every other member of the association, and, therefore, the last clause in that question was unhappily worded. The question really relates to trade promotion through co-operative advertising, in which certain trade slogans are used, such as, 'Made in Grand Rapids,' which was adopted by the furniture manufacturers at that furniture center.

"Generally, activities covered in question (6) are conducted by a trade association in a given local community. An organization at Chicago advertises for its entire membership, which includes every line of commercial endeavor in Chicago, that the city is the great central market. It is co-operative advertising of this class that tends to promote trade extension in given lines or collected lines of industry. Certain of the trade associations, however, do devise trade marks, not for use by all members, but for individual members. It is a well-known fact that when some manufacturer or producer is fortunate enough to select a trade mark that appeals to the public, it becomes a great aid in selling his commodity and, as a result, it is well advertised until it becomes a household word. Other producers or manufacturers of the same kind of an article, in order to take advantage of this situation, will devise a trade name or trade mark as near to that of the successful competitor as he thinks he can go and still escape suit under the trade mark or unfair competition laws.

"The activities of a trade association regarding trade marks to which I referred in my letter of the third relate to the straightening out of instances of unfair competition or infringement as between the members by undertaking to design trade marks for the individual members of the association making the same product that would absolutely prevent confusion on the part of the public as to the producer or manufacturer of the given article and, at the same time, remove all claim of infringement or unfair competition. In other words, the trade-mark activity referred to was that of making the trade marks of each individual member distinctive instead of common. You may, therefore, consider the part of my question (6) referred to in your letter as eliminated from the question, and that the question was really intended to cover the matters stated herein. With this explanation, I feel sure you will agree with me that our views on the matters presented are in complete accord."

Southern Appalachian Operators Veto Union

SOUTHERN Appalachian coal operators are opposed to the closed shop and the check-off. Prior to 1917 this region was non-union in every respect, but for several years has had so-called open-shop working agreements with the United Mine Workers. A resolution proposed and adopted at the annual meeting of the Southern Appalachian Coal Operators' Association, held in Knoxville on Feb. 10, 1922, amends the constitution of that organization as follows:

"That this association have nothing whatever to do with labor matters, except to resist with all its influence and power, both directly and indirectly, any movement to force the mines of this section into a 'Closed Shop' basis, or to adopt the so-called 'Check-off.'"

This is held to mean that the operators will hereafter deal directly with their labor, and that there will be no district agreement.

The meeting at Knoxville, the twelfth annual meeting of its kind for this association, was well attended, more than 100 operators being present. L. C. Gunter was re-elected president. J. E. McCoy, the able and well-known secretary, continues in that office.

Addresses were made at the meeting by Mr. Gunter, by C. D. Boyd, traffic manager; Judge H. B. Lindsay, general counsel for the association, and by Mr. Patterson.

Consolidation Acquires Carter Coal Co.; Now Among Smokeless Shippers

ACQUISITION by the Consolidation Coal Co. of the Carter Coal Co., having four mines in the smokeless field of southern West Virginia shipping navy standard coal, two mines in Virginia south of the Pocahontas region and three mines in Knox County, Kentucky, puts the Consolidation in the list of smokeless shippers and sets at rest several years' speculation in the trade as to when and where the Consolidation would eventually acquire an interest in this field.

The Carter Coal Co. interests, including 16,000 acres of undeveloped high-grade smokeless coal land on Dry Fork in the Pocahontas region, are now developed by four mines, the Olga shaft and Nora No. 8, Thelma No. 6, and Caretta No. 5 drifts. In Virginia the company has the Empire and Seaboard drift mines in Tazewell County, on the Norfolk & Western, with 10,000 acres of coal land. The Kentucky mines, on a 12,000-acre tract in Knox and Bell counties, are known as the Warren, Trosper and Anchor drift.

Except a portion of the Kentucky property all coal lands are owned in fee and the Pocahontas holding is reputed to be the largest single tract so held in that field. The combined annual output of all the Carter Coal Co.'s mines is about 1,000,000 net tons, with a capacity of 1,500,000 tons. The Consolidation announces that the plant will at once be greatly expanded, some reports stating that the aim is to reach 5,000,000 tons a year.

Mine Workers Do Not Desire a Strike, Lewis Says

Scale Committee Insists That Present Basic Wage Schedules Be Maintained—Recommends Adjustments of Inequitable Differentials and Unfair Conditions—Advises Ratification of Anthracite Demands

By E. W. Davison

Special Dispatch to Coal Age

At 10 a. m. Feb. 14 the twenty-eighth annual convention of the United Mine Workers began its sessions in Indianapolis. The report of the scale committee opposed any reduction in mining prices, insisting "that the present basic wage schedules be maintained." "We recommend that inequitable differentials within and between districts, unfair working conditions and internal differences, wherever existing, be adjusted on a fair and satisfactory basis," the report stated, "and the joint conferences in the respective districts be empowered to make such adjustments. The present eight-hour day is merely theoretical, the mine workers being compelled to spend greatly in excess of eight hours in the mines. We hold that eight hours out of twenty-four is the maximum amount of time any mine worker should spend underground. We therefore recommend that all new agreements be based upon the eight-hour day underground."

The committee also took a stand for time and a half for overtime, doubletime for Sundays and holidays, weekly pay days, elimination of automatic penalty clauses in wage agreements, that the convention go on record for ratification of anthracite wage demands formulated in Shamokin and that the next wage scale cover two years.

The scale committee also recommended that International officers demand that the operators in the Central Competitive Field live up to the agreement of March 31, 1920, and confer on a new wage agreement, that John L. Lewis and the presidents of Districts 1, 7 and 9, in the anthracite region, try to arrange a joint conference with anthracite operators for a new agreement there.

Suspension Advised If Agreement Is Not Made

"In case no agreement is reached in anthracite and bituminous fields by April 1 we declare in favor of a general suspension, subject to a referendum vote of the membership of the United Mine Workers previous to March 31."

Appointment of a committee is advised, to be composed of the scale committee of the Central field, three men from each outlying district, the international executive board and officers, to "take such action for the protection of our best interests as circumstances may require and to advise the membership upon unexpected developments which may arise and which now cannot be foreseen." It was recommended also that when an agreement may be made in the Central Competitive Field, the outlying districts be authorized to enter into joint negotiations for wage agreements as in the past, such agreements to run concurrently with the basic agreement in the Central Competitive Field.

"Any wage scale must be submitted to a referendum vote of the membership affected for approval." The convention deferred action on this report until Wednesday, when printed copies were to be given all delegates.

All action on the credentials committee report was postponed until Wednesday, though the Illinois vice president, Harry Fishwick, tried to get the floor to start a contest for the seating of Howat.

Indications early Tuesday morning, Feb. 14, were that war over Alexander Howat and the Kansas mine situation would flare forth some time during the day. The delegates reconvened at 10 a.m. to finish the work begun at last October's session. As president John L. Lewis delivered his address counselling unity at any cost and the full exercise of sound, sober judgment Howat and his men from Kansas sat in the gallery uneasily waiting for Frank Farrington, president of the Illinois district, to see his chance to begin the fight to seat them in place of "Provisional President" Dan Peck of the Kansas district and the contingent of 59 administration men.

It seemed as if the Lewis and Farrington factions were practically agreed upon the report of the scale committee, although the report was still shrouded in secrecy Tuesday morning. Members of the committee, however, gave evidence of believing that the organization should take a stand for a 15- or 20-per cent increase in wages and feel lucky if it could maintain the present level, but that the check-off must be saved. Mr. Farrington, a member of the committee, said no five-day weeks, six-hour days, 40-per cent increases in pay or any other extravagant demands were to be recommended.

In his final statement to the public before the convention opened, President Lewis said: "The United Mine Workers do not desire a strike. We propose to do everything possible in a proper way to prevent such an occurrence. I feel sure when the convention has finished its work the public will realize that fact." This was taken to presage a moderate stand on the part of the union organization.

He professed great satisfaction at the action of the railroad brotherhoods in accepting his invitation to talk over a miner-railroader alliance next week.

The Farrington faction has said little except to declare war on Lewis for "Sticking a knife in Howat's back."

"We are going to make a mighty try to reinstate Howat as president in District 14, and have those revoked charters returned," Mr. Farrington said.

"If you fail, how about holding a rump Howat convention?" a questioner asked.

"I don't think anybody has any thought of that," said he. But Howat was not so positive. He merely did not want to talk about it. The administration feels that Farrington cannot muster as much strength as he displayed for Howat last autumn. Farrington declares he has more. It was expected that before night he would have a chance to marshal it, for the credentials committee had denied Howat and his men the floor and the battle was scheduled to start early.

The National Coal Association, through its representatives, at the meeting of the National Council of the Chember of Commerce of the United States opposed the adoption of the resolution favoring the creation of a commissioner general of transportation. J. D. A. Morrow and W. B. Reed represented the National Coal Association at the meeting.

J. D. A. Morrow, vice-president of the National Coal Association, addressed the annual meeting of the Hazard Coal Operators Exchange, at Lexington, Ky., on Feb. 10. Before returning to Washington he expects to visit Columbus, Cleveland and Pittsburgh.

Mine and Railroad Workers to Confer

John L. Lewis, president of the United Mine Workers of America, announced Feb. 11 that the executives of all the railroad unions with the exception of one of the largest had consented to be parties to a conference with the executives of the mine workers to be held Feb. 21 in Chicago. He is hopeful that the one organization still holding out yet may be induced to be represented by its executive officers. A leader of one of the great railroad brotherhoods has recently pointed out that the rules of the "Big Four" forbid sympathetic strikes.

Production and the Market

Weekly Review

THAT "every cloud has a silver lining" was demonstrated last week in the coal industry. The menacing strike cloud has enlivened buyers' interest and orders for storage coals are increasing daily. While much of the heavier production is going to reserve piles, barometer reports from industrial centers show that current consumption is also heavier.

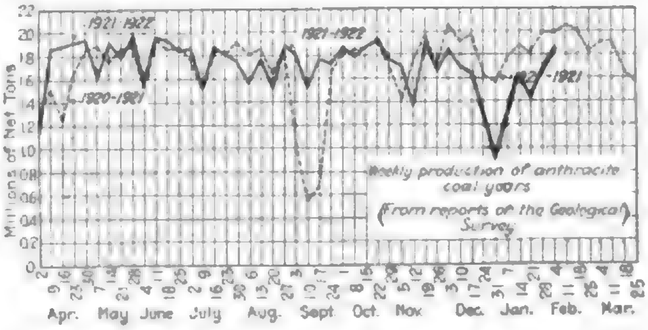
Coal prices have risen, or, rather, the low and unprofitable distress quotations have about disappeared. *Coal Age* Index of spot bituminous coal prices stands at 183 as of Feb. 13, as compared with 182 for the week of Feb. 6. A price boom is unlikely, as too many mines are standing idle ready to fill in the gap between supply and demand when the latter has picked up sufficiently to warrant a resumption of operations.

STRIKE THREAT A REVERSAL OF USUAL ORDER

The underlying psychology of the present threatened strike is vastly different from any that has occurred in the mine regions in the past quarter of a century. On previous occasions the walk-out was the result of demands for higher wages, which usually were won and which spelled higher coal prices. Conditions are reversed today. A strike, if it comes, will flow from the demand for lower wages, which will result in reduced prices for coal. In other words, the outcome of the strike is likely to be cheaper coal, whereas conflicts in recent years have been followed by higher-priced fuel. Users are taking this aspect of the situation into consideration and argue that there is little inducement to stock up now greatly in excess of needs. The only point of perplexity is the probable length of the shutdown. If output should be halted for a long period, users without sufficient stocks to carry them over would suffer, and this angle is being given special study.

Rail union chiefs have agreed to discuss the proposed alliance with the miners to fight against wage reductions. The meeting is set for Feb. 21, at Chicago, following closely the miners' convention at Indianapolis. Confronted with this disturbing possibility, the industrial buyer has felt the necessity of playing safe in the event that a coalition of mine and railroad labor closes the avenues of non-union coal supply.

Retail anthracite business has been stimulated by more seasonable weather. Householders are still keeping orders at the minimum, but as this policy has been followed throughout the season, an increase, caused by weather conditions, has been immediately apparent. Retail stocks continue to dwindle as replacement orders to the mines are being withheld with a view to going into April with stocks at a low point.

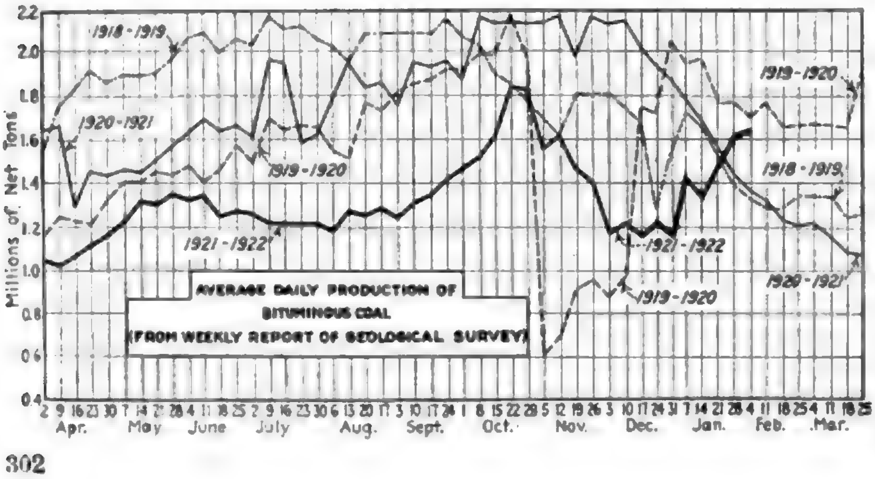

Weekly production of anthracite coal years
(From reports of the Geological Survey)

Independents at best are obtaining only company schedules for domestic coals, while pea, which is very sluggish, is being quietly shaded by some of the larger producers. Continued scarcity of steam sizes has strengthened independent quotations.

BITUMINOUS

Production continues to increase. The total output during the first week of February was 9,708,000 net tons, an increase of 88,000 tons when compared with the output for the previous week. At the current rate of production and consumption reserve stocks are steadily growing. That this rate is increasing is indicated by reports of loadings for the first two days of last week, when 2,000 cars more were loaded than in the corresponding days of the week preceding.

Coastwise receipts are heavier. This is attributed mainly, however, to the fact that bad weather had bunched New


AVERAGE DAILY PRODUCTION OF BITUMINOUS COAL
(FROM WEEKLY REPORT OF GEOLOGICAL SURVEY)

Estimates of Production

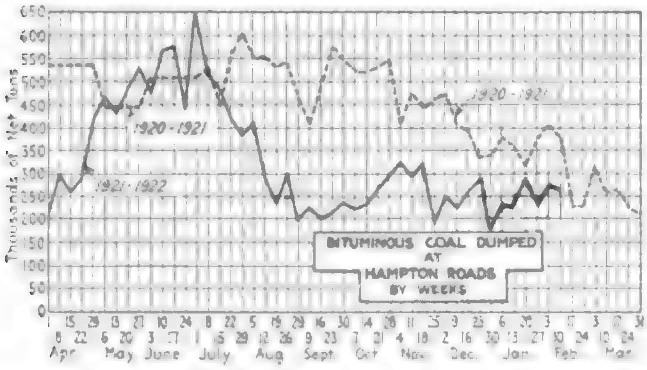
(Net Tons)

BITUMINOUS COAL

	1921—1922	1920—1921
Week Ended:		
Jan. 21 (b)	8,782,000	9,184,000
Jan. 28 (b)	9,620,000	8,570,000
Feb. 4 (a)	9,708,000	8,132,000
Daily average	1,618,000	1,355,000
Coal year	350,439,000	466,581,000
Daily aver. coal yr.	1,350,000	1,790,000
ANTHRACITE		
	1922	1921
Jan. 21	1,443,000	1,819,000
Jan. 28	1,607,000	1,999,000
Feb. 4 (a)	1,811,000	1,985,000
COKE		
Jan. 28	113,000	248,000
Feb. 4 (a)	122,000	234,000
Calendar year	577,000	1,277,000

(a) Subject to revision. (b) Revised from last report

England cargoes at the Roads and bulked the movement into a relatively short period. Bunker tonnage shows a gain lately. Total dumpings at the Hampton Roads piers were 254,178 net tons during the week ended Feb. 9, as compared with 271,032 tons in the previous week. Accumulations are growing at the piers, but the market is reflecting a better tone throughout.



In the month of January there was dumped over Tidewater piers a total of 2,325,000 net tons. In comparison with December, this represented a decrease of 120,000 tons.

The quantity exported is placed at 141,000 net tons, equivalent to an annual rate of 1,690,000 tons. How complete is the depression in the export trade may be judged from the fact that in 1919 exports were 8,292,000 tons; in 1920, nearly 22,000,000, and in 1921, 9,633,000 tons.

TIDEWATER BITUMINOUS COAL SHIPMENTS FOR JANUARY, 1922
(In net tons)

Destination	New York	Philadelphia	Baltimore	Hampton Roads	Charleston	Total
Coastwise to New England	58,000	42,000	63,000	716,000	.....	879,000
Exports	1,000	14,000	25,000	87,000	14,000	141,000
Bunker	219,000	32,000	27,000	179,000	1,000	456,000
Inside capes.	....	156,000	99,000	15,000	.....	270,000
Other tonnage	522,000	2,000	3,000	52,000	.....	579,000
Total......	798,000	246,000	217,000	1,049,000	15,000	2,325,000

A sudden increase in all-rail coal shipments to New England was recorded during the week ended Feb. 4, when 3,531 cars were forwarded—721 cars in excess of the preceding week's movement. The New England market is taking more coal, most of it via Hampton Roads, although central Pennsylvania grades have been better taken at slight concessions. Marine freights have strengthened recently, due to better demand and poor transportation weather. A continuance of this strength will enlarge all-rail shipments in the more closely competitive New England territory.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Jan. 16 1922	Jan. 30 1922	Feb. 6 1922	Feb. 13 1922†
Pocahontas lump..........	Columbus....	$3.45	$3.30	$3.25	**$3.25@$3.40**
Pocahontas mine run......	Columbus....	2.15	2.15	2.15	*1.75@2.10*
Pocahontas screenings....	Columbus....	1.50	1.55	1.30	**1.25@1.50**
Pocahontas lump..........	Chicago......	3.10	2.85	3.00	**2.75@3.50**
Pocahontas mine run......	Chicago......	2.10	2.15	2.00	**2.00@2.50**
Pocahontas lump..........	Cincinnati....	3.00	3.15	3.15	3.00@3.25
Pocahontas mine run......	Cincinnati.	1.90	2.05	1.85	1.75@2.00
Pocahontas screenings....	Cincinnati...	1.30	1.40	1.20	*1.00@1.15*
*Smokeless mine run......	Boston.......	4.80	4.70	4.70	**4.70@4.85**
Clearfield mine run......	Boston.......	2.05	1.95	1.95	1.70@2.25
Cambria mine run.........	Boston.......	2.45	2.45	2.45	2.25@2.60
Somerset mine run........	Boston.......	1.80	1.90	1.90	1.75@2.00
Pool 1 (Navy Standard)...	New York....	3.00	2.85	2.85	**2.75@3.25**
Pool 1 (Navy Standard)...	Philadelphia.	3.00	3.00	3.00	2.85@3.25
Pool 1 (Navy Standard)...	Baltimore....	2.30	2.70	2.55	**2.50@2.70**
Pool 9 (Super. Low Vol.)..	New York....	2.25	2.20	2.35	**2.35@2.50**
Pool 9 (Super. Low Vol.)..	Philadelphia	2.30	2.40	2.45	2.20@2.65
Pool 9 (Super. Low Vol.)..	Baltimore....	2.15	2.45	2.20	**2.15@2.40**
Pool 10 (H. Gr. Low Vol.)	New York....	1.95	2.05	2.05	**1.90@2.25**
Pool 10 (H. Gr. Low Vol.)	Philadelphia.	2.00	2.00	2.10	1.95@2.20
Pool 10 (H. Gr. Low Vol.)	Baltimore....	1.90	2.05	2.00	**2.00@2.10**
Pool 11 (Low Vol.)........	New York....	1.70	1.65	1.75	1.65@1.85
Pool 11 (Low Vol.)........	Philadelphia	1.70	1.70	1.75	1.65@1.85
Pool 11 (Low Vol.)........	Baltimore....	1.80	1.95	1.85	*1.70@1.80*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)...	New York....	1.45	1.40	1.50	1.40@1.60
Pool 54-64 (Gas and St.)...	Philadelphia..	1.55	1.50	1.50	1.40@1.60
Pool 54-64 (Gas and St.)...	Baltimore....	1.40	1.65	1.45	*1.35@1.50*
Pittsburgh Sc'd. gas.......	Pittsburgh....	2.65	2.65	2.65	2.60@2.70
Pittsburgh mine run (St.)..	Pittsburgh....	2.15	2.15	2.15	2.10@2.20
Pittsburgh slack (Gas)....	Pittsburgh....	1.80	1.75	1.65	1.60@1.70
Kanawha lump	Columbus	2.95	2.50	2.65	2.50@2.75
Kanawha mine run	Columbus	1.80	1.65	1.65	1.50@1.80
Kanawha screenings.....	Columbus....	1.50	1.15	1.30	**1.25@1.45**
W. Va. Splint lump	Cincinnati ..			2.55	**2.50@2.75**
W. Va. Gas lump.......	Cincinnati ..	2.50	2.45	2.25	*1.75@2.25*
W. Va. mine run........	Cincinnati.	1.45	1.35	1.45	**1.50@1.65**
W. Va. screenings	Cincinnati....	1.00	1.05	1.10	**1.25@1.35**
Hocking lump.........	Columbus	2.85	2.50	2.65	**2.60@2.85**
Hocking mine run.......	Columbus.	1.85	1.90	1.75	**1.75@2.00**

	Market Quoted	Jan. 16 1922	Jan. 30 1922	Feb. 6 1922	Feb. 13 1922†
Hocking screenings........	Columbus....	$1.50	$1.25	$1.35	$1.25@$1.50
Pitts. No. 8 lump.........	Cleveland....	3.50	3.05	3.00	**3.00@3.25**
Pitts. No. 8 mine run......	Cleveland....	2.10	2.00	2.00	*1.95@2.00*
Pitts. No. 8 screenings.....	Cleveland....	1.95	1.55	1.70	*1.60@1.75*
Midwest					
Franklin, Ill. lump.......	Chicago.....	3.50	3.65	3.65	3.25@4.05
Franklin, Ill. mine run....	Chicago.....	2.80	2.35	2.35	**2.25@2.75**
Franklin, Ill. screenings..	Chicago.....	2.00	1.90	2.00	*1.65@1.85*
Central, Ill. lump	Chicago.....	3.10	3.00	3.00	2.75@3.25
Central, Ill. mine run.....	Chicago......	2.50	2.35	2.35	2.25@2.50
Central, Ill. screenings....	Chicago......	1.80	1.50	1.65	**1.60@1.90**
Ind. 4th Vein lump......	Chicago.....	3.35	3.25	3.25	3.00@3.50
Ind. 4th Vein mine run ..	Chicago.....	2.55	2.40	2.50	2.35@2.65
Ind. 4th Vein screenings...	Chicago.....	2.10	1.60	1.85	**1.75@2.00**
Ind. 5th Vein lump.......	Chicago.....	2.95	2.95	2.95	*2.60@3.00*
Ind. 5th Vein mine run ..	Chicago.....	2.25	2.20	2.25	2.10@2.40
Ind. 5th Vein screenings...	Chicago.....	1.65	1.45	1.55	**1.50@1.75**
Standard lump	St. Louis.....	2.75	2.90	2.90	2.65@3.00
Standard mine run......	St. Louis.....	1.90	2.00	1.90	1.85@2.00
Standard screenings.....	St. Louis.....	1.35	1.00	1.00	**0.90@1.20**
West. Ky. lump.........	Louisville....	2.75	2.60	2.60	*2.40@2.75*
West. Ky. mine run......	Louisville....	1.75	1.90	1.90	*1.70@2.00*
West Ky. screenings......	Louisville....	1.25	0.95	1.15	**1.00@1.50**
South and Southwest					
Big Seam lump	Birmingham..	2.75	2.90	2.90	2.75@3.00
Big Seam mine run......	Birmingham..	2.10	1.85	1.85	1.75@2.00
Big Seam (washed)......	Birmingham..	2.15	2.10	2.10	2.00@2.25
S. E. Ky. lump......	Louisville....	2.85	2.75	2.90	*2.65@2.85*
S. E. Ky. mine run.......	Louisville....	1.55	1.55	1.45	**1.50@1.75**
S. E. Ky. screenings......	Louisville....	1.25	1.10	1.15	1.10@1.25
S. E. Ky. lump	Cincinnati.	2.55	2.75	2.90	*2.50@2.85*
S. E. Ky. mine run.....	Cincinnati...	1.35	1.45	1.45	**1.50@1.75**
S. E. Ky. screenings.....	Cincinnati.	1.10	0.95	0.85	**1.00@1.10**
Kansas lump..........	Kansas City..	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City..	4.10	4.00	4.00	4.00
Kansas screenings........	Kansas City..	2.50	2.50	2.50	2.50

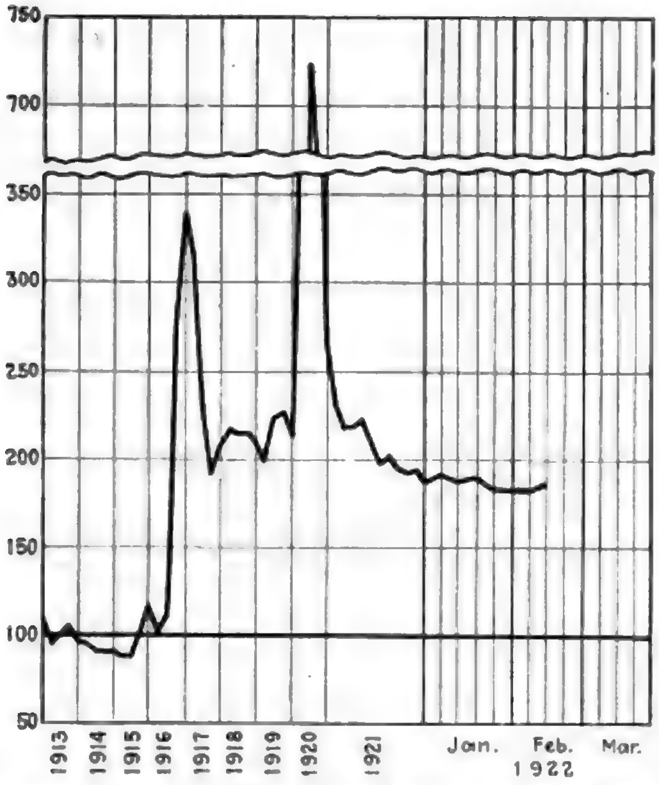
*Gross tons, f.o.b. vessel, Hampton Roads

†Advances over previous week shown in **heavy type**, declines in *italics*

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Jan. 30, 1922 Independent	Jan. 30, 1922 Company	Feb. 6, 1922† Independent	Feb. 6, 1922† Company	Feb. 13, 1922† Independent	Feb. 13, 1922† Company
Broken..............	New York.....	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken..............	Philadelphia	2.66	$7.00@$7.50	7.75@7.85	$7.00@$7.50	7.75@7.85	$7.00@$7.50	7.75@7.85
Egg.............	New York.....	2.61	7.25@7.75	7.60@7.75	7.50@7.75	7.60@7.75	7.50@7.75	7.60@7.75
Egg.............	Philadelphia..	2.66	7.15@7.75	7.75	7.15@7.75	7.75	7.15@7.75	7.75
Egg.............	Chicago.....	5.63	7.50*	6.95*	7.50*	6.95*	7.50*	**7.40***
Stove	New York.....	2.61	7.85@8.10	7.90@8.10	7.85@8.10	7.90@8.10	7.85@8.10	7.90@8.10
Stove.............	Philadelphia	2.66	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Stove.............	Chicago.....	5.63	7.75*	7.20*	7.75*	7.20*	7.75*	**7.60***
Chestnut	New York.....	2.61	7.85@8.10	7.90@8.10	7.85@8.10	7.90@8.10	7.85@8.10	7.90@8.10
Chestnut	Philadelphia...	2.66	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Chestnut	Chicago.....	5.63	7.75*	7.20*	7.75*	7.20*	7.75*	**7.60***
Pea	New York.....	2.47	4.75@5.50	6.05@6.45	5.00@5.75	6.05@6.45	*5.00@5.50*	*5.75@6.60*
Pea..........	Philadelphia.....	2.38	4.75@5.00	6.15@6.25	4.75@5.00	6.15@6.25	4.75@5.00	6.15@6.25
Pea	Chicago.....	5.63	6.10*	5.60*	6.10*	5.60*	6.10*	**6.10***
Buckwheat No. 1......	New York.....	2.47	2.85@3.50	3.50	3.00@3.50	3.50	**3.00@3.60**	3.50
Buckwheat No. 1......	Philadelphia	2.38	2.75@3.25	3.50	2.50@3.25	3.50	**2.75@3.25**	3.50
Rice	New York.....	2.47	2.00@2.50	2.50	2.00@2.50	2.50	2.00@2.50	2.50
Rice..........	Philadelphia..	2.38	2.00@2.25	2.50	1.75@2.25	2.50	1.75@2.25	2.50
Barley	New York.....	2.47	1.35@1.75	1.50	1.50@1.75	1.50	1.50@1.75	1.50
Barley	Philadelphia..	2.38	1.25@1.50	1.50	1.00@1.50	1.50	**1.00@1.75**	1.50
Birdseye........	New York.....	2.47		2.50	....	2.50		*2.00@2.50*

*Net tons, f.o.b. mines. †Advances over previous week shown in **heavy type**, declines in *italics*



Coal Age Index, 183, Week of Feb. 13, 1922. Average spot price for same period, $2.22. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

Agricultural products are in much better position, and this has a definite bearing on the coal market. Iron and steel, while not up to the level anticipated for this time of the year, give promise of early improvement. Late reports indicate that unemployment has waned slightly. From these and other signs a better market is seen, based on actual requirements, although conditions are still far below normal. The feeling prevails in trade circles that the disposition of the wage question will remove the bar to a more healthy demand.

For the first time in months, mines in the Middle West are behind on their domestic orders. Aside from the inevitable strike stimulus there is a little better market for coal for current requirements reported from nearly every important center. Buyers are seeking quotations on new contracts as well as protection over the next 45 days, but producers are not inclined to quote on much forward business.

Non-union mines continue to obtain the major portion of any competitive business offering. Pittsburgh district producers have failed to obtain much additional tonnage, the business going largely to the Connellsville section, but producers report that the men appear only passive in their stand on the check-off controversy, despite the attitude of their leaders, and that individual working agreements seem likely before April 1.

ANTHRACITE

Production during the week ended Feb. 4 increased to 1,811,000 net tons, compared with 1,607,000 tons the week before. While the retail business has improved, hand-to-mouth buying is still the order of the day. This attitude of the householder is reflected in retailers' orders to the mines, and yard stocks are gradually being worked off. Independents are working at a better rate, although their domestic prices at the most are only equal to company schedules. Steam sizes are growing scarcer and quotations are up.

A sudden increase has occurred in all-rail shipments to New England. During the week ended Feb. 4 3,047 cars were forwarded, 1,297 more than in the previous week.

COKE

Beehive coke production was 122,000 net tons during the week ended Feb. 4, an increase of 9,000 tons when compared with the previous week. The market is slightly stronger, as offerings have been very restricted lately. Producers are finding the coal market more attractive at the present time and coke buyers have been unable to obtain tonnage at the low prices which recently prevailed.

Foreign Market And Export News

British Export Coals More Active; Further Rail Cut Urged; Production Increases

Production in Great Britain during the week ended Jan. 28 increased to 4,739,000 gross tons from 4,561,000 tons in the preceding week, according to a cable to *Coal Age*.

The market has been featured by more active buying, in which France, Italy, Spain and South America participated. Heavy orders are coming from India and the Far East and prices have stiffened. British railway coal contracts have been arranged for a six months' period. The prices are from 11s.@12s. below the last contracts. The Eastern Coast market has strengthened with prices generally a shilling higher. New business includes 40,000 tons of gas coal for Stockholm at 20s. 6d.; 20,000 tons of coking coal, unscreened, for Belgium at 72 francs c.i.f., delivery over the next three months; 60,000 tons of coking coal, unscreened, f.o.b., delivery monthly throughout the year.

The latest figures show that unemployment tends to decrease. According to the official *Labor Gazette*, there were 1,069,726 wage earners on the colliery books of the United Kingdom for the fortnight ended Dec. 17, 1921. This is an increase of 0.6 per cent as compared with the figures for the previous month. There is also an improvement in the number of days worked per week.

Owners are still dissatisfied with the reduction in rail rates—8d. for export coal and 11d. for industrial fuels—and will approach the railroad companies for a further reduction. The owners consider that the reduced transport and shipment charges are still too high to afford any considerable relief to the industry and that the trifling and altogether unsatisfactory character of the decreases announced in respect of shipment charges is no encouragement to development. Such costs are in certain districts still in the neighborhood of 400 per cent above their pre-war level.

The Mining Association points out that there has been an appreciable increase in the volume of coal export traffic, the tonnage in December being at the rate of 52 millions a year, as compared with the corresponding figure of 27 millions for 1920, based on the exports during December of that year. Further there have been substantial reductions in locomotive coal since the case for reduced rates was submitted by the owners last October, while the railroads have further benefited from recent reductions in wages and in the cost of all materials and stores.

A statement issued by the Northumberland Miners' Association sums up the feelings of the miners throughout Britain on the prospects for a brighter future. The statement reads, in part, "As we look into the future we are not so hopeful of a rise in wages as we are of a fall in the cost of living, which will give to wages a greater value. Our hope is not only in the probable fall in the cost of living, but we expect much from a fall in the cost, other than wages, of producing coal. Colliery owners must recognize that only by educative knowledge of what the various costs are will workmen ever be induced to share the responsibility, as they should do, of keeping those costs down. Therefore, instead of hiding the separate costs in the lump sum, they would serve their own interest best by itemizing these costs as far as possible."

The British Treasury has issued a Minute dealing with the method adopted for effecting payment by Italy for certain deliveries of coal made by France to Italy during the war. The French Government explains that the supply of this coal to Italy has involved the purchase by France from Britain of coal in replacement. These purchases were effected from advances made to France by Britain, and accordingly France has asked that the French debt be reduced and the Italian debt to Britain increased by the value of the coal deliveries, amounting to £2,021,858. This course has been agreed to and Italian Treasury bills have been accepted by Britain and French Treasury bills surrendered to the equivalent value.

Coal Paragraphs from Foreign Lands

SPAIN—All restrictions have been removed until further notice on the exportation of coal and other kinds of mineral fuel. This relaxation is necessitated by the large surplus stocks accumulating at the pit heads, due to the industrial slump, which has caused domestic production to be in excess of the national needs. The Ministry of the Interior is given power to limit or suspend exportation if the national situation demands such action.

SOUTH AFRICA—The general strike originated in the refusal of wage-earners to fall in line with the march of deflation, as coal-miners objected to a five-shilling cut. The long-standing color problem was injected into the controversy, making the adjustment more difficult. There is no disposition of owners to remove the "color bar"; what they desire is the maximum economic production. The method of obtaining this, whether through a greater ratio of colored labor or more hours per day, is now the problem confronting General Smuts and his conferees.

ITALY—Cardiff steam first is quoted on the Genoa market at 38s. according to a cable to *Coal Age*. The market has taken an upturn since the last report, when the ruling quotation was 37s. 3d.

Export Clearances, Week Ended, Feb. 9, 1922

FROM HAMPTON ROADS

	Tons
For Africa:	
Br. S.S. Heathfield, for Dakar	7,026
Du. S.S. Bondowaso, for Port Said	5,167
Am. S.S. Sioux, for St. Lucia	2,395
For Argentine:	
Du. S.S. Veerhaven	4,054
For Atlantic Islands:	
Nor. S.S. Johan Ludwig Morwinckel, Guaynabal	2,000
For Brazil:	
Br. S.S. Mitchell, for Para	1,202
For Canada:	
Br. S.S. Bethlehem, for St. Johns, N. B.	3,054
Sw. S.S. Italia, for St. Johns, N. B.	2,610
For Cuba:	
Nor. S.S. Trafalgar, for Antilla	2,471
Dan. S.S. Viborg, for Havana	2,675
Nor. S.S. Hollgjerd, for Sagua la Grande	2,006
Am. Schr. St. Johns, N. F., for Sagua la Grande	3,113
For Portugal:	
Port. Schr. Aveiro, for Lisbon	1,269
FROM PHILADELPHIA:	
For Cuba:	
Am. Schr. Charles Chittemore, for San Juan	

Favorable Developments at the Roads

Dumpings were brisk during the week ended Feb. 9, although they showed a slight decrease from the week before, with business better at the end of the week and demand growing. Accumulations were increasing, with upward of 300,000 tons on hand at the end of the week.

Prices of the best grades held firm, while Pool 2 was quoted as low as $4.35, with $4.40 as the general quotation. Considerable supply was being held on the spot, with demand picking up at the week-end.

Increased production at the mines was responsible for large surplus supplies on hand here. The tone of the market is somewhat stronger than at any time the last 30 days.

Dealers were optimistic of a continued revival in trade. One favorable note struck in the market was in the announcement that the Old Dominion Investment & Holding Co. will charter five steamers to carry coal from Hampton Roads to the company's paper mills in Canada.

The passage of the $5,000,000 port bond issue, providing for erection of municipal terminals, is taken by coal men to mean that business will take another leap at Hampton Roads, with the prospect of an increase in general shipping.

Pier and Bunker Prices, Gross Tons

Foreign Bunker Quotations by Cable to Coal Age

PIERS

	Feb. 4	Feb. 11†
Pool 9, New York	$5.60@$5.80	**$5.65@$5.90**
Pool 10, New York	5.25@ 5.50	**5.35@ 5.55**
Pool 9, Philadelphia	5.50@ 5.70	5.50@ 5.70
Pool 10, Philadelphia	5.15@ 5.35	5.15@ 5.35
Pool 71, Philadelphia	5.65@ 5.80	5.65@ 5.80
Pool 1, Hamp. Rds	4.65@ 4.75	*4.65*
Pools 5-6-7 Hamp. Rds	4.30	4.30
Pool 2, Hamp. Rds	4.45	*4.40*

BUNKERS

	Feb. 4	Feb. 11†
Pool 9, New York	5.95@ 6.15	**6.00@ 6.20**
Pool 10, New York	5.60@ 5.85	**5.65@ 5.90**
Pool 9, Philadelphia	5.75@ 6.00	5.75@ 6.00
Pool 10, Philadelphia	5.55@ 5.65	5.55@ 5.65
Pool 1, Hamp. Rds	4.75	*4.75*
Pool 2, Hamp. Rds	4.80	*4.65*
Welsh, Gibraltar	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Marseilles	120 fr. f.o.b.	120 fr. f.o.b.
Welsh, Genoa	40s. t.i.b.	40s. t.i.b.
Welsh, Messina	37s. t.i.b.	*36s. 6d. t.i.b.*
Welsh, Algiers	35s. f.o.b.	35s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	40s. f.a.s.	40s. f.a.s.
Welsh, Teneriffe	40s. f.a.s.	40s. f.a.s.
Welsh, Malta	40s. f.o.b.	40s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Port Said	49s. f.o.b.	49s. f.o.b.
Belgian, Antwerp	30s.	30s.
Alexandria	45s.	45s.
Bombay	38 rupees	38 rupees
Capetown	42s.	42s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Cardiff:	Feb. 4	Feb. 11†
Admiralty, Large	24s. 9d.	24s. 6d.@25s.
Steam, Smalls	18s. 6d.	18s. @ 19s.
Newcastle:		
Best Steams	24s. 6d.	**24s. 9d.@25s.**
Best Gas	21s. 9d.	**22s. 6d.@23s.**
Best Bunkers	21s. 6d.	**22s.@22s. 6d.**

Advances over previous week shown in heavy type; declines in *italics*.

German Production Increasing

Production in the Ruhr region during the week ended Jan. 28 was 1,908,000 metric tons, according to a cable to *Coal Age*. The output of the previous week was 1,929,000 tons.

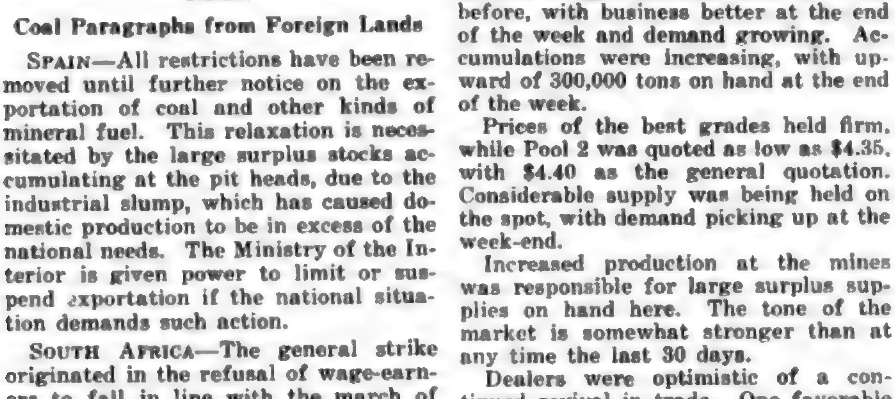
German production for the first nine months of 1921 was considerably larger than during the corresponding period of 1920, according to figures published by *Commerce Reports*. The output, as shown in the following table, does not include production of Alsace-Lorraine, Paltinate and the Saar.

GERMAN PRODUCTION, JAN.-SEPT.

Kinds of coal	1913	1920	1921
	January-September— (Thousands of Metric tons)		
Pit coal	130,178	95,737	100,603
Lignite	64,132	81,193	90,820
Coke	22,768	18,292	20,760
Briquets:			
Hard coal	4,406	3,571	4,275
Lignite	15,994	17,921	22,239
Pit coal in the Saar	....	6,892	6,149

A very definite influence on production costs of all commodities will be exercised by the advance in freight rates, Feb. 1, averaging 33⅓ per cent, the proposed doubling of the coal tax (to 40 per cent) as well as the additional normal taxation necessary to meet, even partially, the heavy deficits in both the ordinary and extraordinary budgets.

Bavarian coal deposits have been located between Morishofen and Stockheim. Hitherto Bavaria has had no coal supply of its own and has suffered seriously from strikes and transportation difficulties.



Cincinnati Gateway

Contract Inquiries Find Few Takers in Cincinnati

Uncertainty Regarding Labor Developments Around April 1 Has Deterrent Effect — Warmer Weather Lessens Domestic Consumption — Industry Perks Up a Little

Buyers are coming into the market for reserve coal, to be stored as a precaution against the threatened strike. Domestic fuels are in slightly less demand as the warmer weather has brought some let-up in consumption. The better grades are still moving very well, however.

Customers are inquiring for contract coal, but takers are few, as much hinges on labor developments around April 1. Industrial requirements are slightly increased, following greater manufacturing activity.

CINCINNATI

Sharp contrasts were shown in the market last week. Domestic coal, on which most of the attention has been showered for months was dull. Poorer grades of West Virginia sagged below the $2 mark. On the other hand mine run and steam sizes showed a stronger tone and with increasing inquiry better grades of splints and some gas coals showed a price advance.

Hazard operators seem to have oversold on low-priced bituminous lump and block, according to the inquiries that keep coming in. While this has not advanced the price it has helped to stabilize the market. West Virginia gas block and lump is hard to move, while the splint is a bit better off. Run of mine from the latter state has advanced and some sells 10c. above the same type offered from southeastern Kentucky. Slack is equally as firm.

A cold spell helped along the retail business for a few days, though it has again dropped back into a give-and-take condition with deliveries about keeping pace with actual requirements. Pocahontas lump and egg sells at $8, run of mine at $6.25@$6.50 and screenings. $5.25@$5.50. Bituminous lump is $6.50@$7; run of mine, $5.50@$5.75 and slack, $4.50. This last is an advance of 50c. a ton which followed the wholesale increase of the past few days.

LOW-VOLATILE FIELDS

New River and the Gulf

New River production is being steadily increased. This is made possible by a better Tidewater market, weather conditions and an impending strike. Industrial conditions are unchanged.

Gulf mines are now producing at a rate of about 60 per cent of potential capacity. Bunkers are more active and the line business has also increased. Although part of the additional demand is due to artificial causes, nevertheless nearly all mines now have enough business to keep them operating part of the time at least.

Pocahontas and Tug River

Although not greatly stimulated, Pocahontas production is proceeding at a rate not under 60 per cent of capacity. As production has become stabilized at this figure it indicates to what extent contract shipments are being made. Eastern business has improved considerably and larger shipments are being made to coastwise markets, while domestic has a ready sale in the West. Nut and slack is plentiful with comparatively very little market.

Shipments from the Tug River section continue at about 90,000 tons weekly. There is a little better demand in evidence, however. Much of the coal is going West and contracting is also being done on a small scale, but producers prefer to await April 1 before making many new agreements.

HIGH-VOLATILE FIELDS

Kanawha

Present wage scales make it impossible for producers to secure any of the better business that is going past them. The prospect of a strike has caused a buying spurt in the non-union high-volatile districts. Production early in the month was limited to 8,500 tons daily, representing the output of only a few mines in the territory.

Logan and Thacker

With the possibility of a strike Logan production has increased and inquiries have become more numerous. Many orders for delivery over sixty days have been placed, which has stiffened the market.

Larger railroad fuel consumption enabled Thacker operators to increase their tonnage. The probability of a strike has also induced buyers to place additional orders. This emergency buying was confined for the most part to mine run.

Northeastern Kentucky

Production has been stimulated by a better domestic demand and also by the strike talk, with the result that about 50 per cent of capacity is being mined. The larger sales of steam coal are attributed almost entirely to the strike discussion. Slack is more plentiful and prices have consequently eased up.

SOUTHEASTERN KENTUCKY

Call for domestic is again stimulated. Mines are better able to take care of bookings for screenings, demand for which has steadily improved.

While there has been no great amount of coal bought for storage against the strike situation, a great deal of curiosity is being manifested by big buyers over the matter and there are at present a number of inquiries for large tonnages going the rounds. Operators are not inclined, however, to quote for future delivery and actual bookings continue to be on hand-to-mouth basis.

Prices are firm, with a slight upward trend and are shown in the Weekly Review.

West

DENVER

The industry, as a general thing, is disorganized, due to over-production and mild weather. Bituminous coking coal from Trinidad is down to $2.50 at the mine, and is retailing for $6.60 instead of $7.40. Walsenburg and Routt bituminous slack sells for $1.75 @$2, having been cut 75c., and retails for $5.45 in Denver.

Nine small dealers are reported to have taken over a contract to supply sugar factories with 30,000 to 40,000 tons of lignite slack, getting $1.50@ $1.75 a ton. Two large concerns that formerly received this contract have been left out of the deal, it is understood, and are unloading their slack for 50c.@$1 a ton at the mine.

Most of the mines which asked the state industrial commission for authority to cut wages have been granted this right. The North Park Coal Co. sought reductions which, the commission declared, were lower than wages paid in other mines. There is a higher freight rate between this and competitive territory into Denver, and the company sought to show that only a very low wage scale could meet the prices of other mines. This is the only case where the commission has refused authority to cut rates.

KANSAS CITY

Spring weather has continued and prevented any change in market conditions. The light demand for lump and nut has reacted on the steam market to some extent with the result that the surplus of steam coal is not noticeable. There is no change in the price of Kansas slack and Illinois slack is continuing in erratic quotations ranging $1.25@$1.40 f.o.b. mines, central Illinois district.

Were it not for the many discouraging features there is no doubt that the Southwestern operators would feel considerably heartened by other factors which will affect future business. Increases in farm products will mean additional profit to the farmers and will have a great deal of influence on the coal market situation during the spring months. North Missouri lump is $4.75; mine run, $3.50, washed slack, $3.25, raw slack, $2.50; Arkansas lump, $6, mine run, $4, slack, $2.50@$3; McAlester lump, $8.50, nut, $7, slack, $2.50; central Illinois lump, $2.75@ $3.25, egg, $2.50, slack, $1.25@$1.40.

SALT LAKE CITY

Retail business continues excellent. The operators also report an improvement, but owing to the Pacific Coast market being flooded with foreign coal at a much cheaper rate than the Utah mines can make, after freight charges are added, this improvement is not such as to make things even near normal.

Northwest

Coal Market in Northwest Keeps Pace with Weather

Seasonable Temperature Brings Activity in Domestic Fuel—Movement Off Docks Is Heavier—All-Rail Coal Being Stored in Case of Labor Troubles

Northwestern markets continue to be purely a weather proposition. Industrial consumption has increased only slightly but domestic coals are more active with a period of seasonable weather. Coal is moving off the docks in heavier volume and some all-rail fuel is being stored in anticipation of labor troubles at the mines. Prices have been increased, although quotations on the Minneapolis market are still lower than those prevailing a few weeks ago.

DULUTH

Shipments from the docks showed a large increase during January as a result of cold weather over the Northwest. The shipments aggregated 24,521 cars as compared with 15,444 during December, and only 8,403 cars during January last year.. Duluth docks shipped out 8,887 cars and Superior docks 15,634.

Demand for Iron Range towns is much better this week. Intermittent cold weather has had much to do with this increase, of course, but it is thought business conditions in the Northwest are improving as well, and that more money is in circulation to enable people to lay in supplies of coal.

Dock prices on bituminous and anthracite are holding along the line with every appearance of continued firmness. Pocahontas is at $9 for lump, but run of mine has dropped to $6 from $7 and screenings are off to $5. Regular screenings are skyrocketting. Prices last week were quoted at $4, and an advance to $4.25 is predicted.

More complaints are being received about the quality of anthracite being sold here. A big selling move is being planned by dealers and dock men here to get the docks ready to receive cargoes at the opening. The push will be put on within the next week and will include a fine-tooth survey of the Northwest with an idea of finding out any possible places where coal can be placed.

MINNEAPOLIS

Cold weather, which has prevailed for some time, has had its effect. Prices on soft coal, which were advanced 50c. by a single company a couple of weeks ago, have been marked up by some of the others. Since the cut some weeks ago was $1 a ton this is not much of an advance, all things considered. But it is probable that it is all the market will stand this season.

However, except for the keen competition the present winter has not been a bad one from the standpoint of the coal business. But now with spring in sight it is hardly possible for much more to be expected in the way of tonnage moved. Domestic, apartment, hotel and office building heating consumption has run to a very fair total. But without a better outlet through industrial and railroad needs, there is not much hope for more than a moderate total of coal to go into consumption.

Hard coal will probably show a fair volume for the winter. It has had considerable competition from coke and various soft coals, which have kept down consumption. But after this has been allowed for, there still remains a considerable tonnage, and the high prices have not kept these from buying.

Soft coal has gone into domestic use perhaps a little freer, relatively than hard. It has been possible to get some grades which were out of the market until within a year, such as smokeless. Many people have turned to this as a substitute for hard coal. Other Eastern soft coals have also been resorted to as a substitute for hard coal. But in many instances, consumers have found that the substitutes were unsatisfactory. So the trade has had a great deal of experimenting done by consumers, and with varying results.

The past week has been one which stimulated orders, for there have been two or three mornings when the thermometer went low. People are stringing out their supplies as long as possible, and these days have run down their fuel piles to the vanishing point.

MILWAUKEE

The market is more satisfactory to dealers just now than it has been at any time during the present winter. Home consumption is better in the city, and industrial plants are beginning to husband stock piles in anticipation of mine troubles in the spring.

Jobbers of rail coal report a stiffening in the supply of Pocahontas and screenings in the East, and a disposition to be more firm as to price. Dock men also evince an inclination to be less free in marketing their holdings of screenings.

This attitude tends to dissipate the feeling which has lingered in the minds of some consumers that soft coal and possibly hard was in for a drop before spring. No change in prices of hard or soft coal have been announced. One of the floating cargoes of hard coal and two cargoes of soft coal have been unloaded thus far this month, and other cargoes will follow as fast as the docks afford room.

New England

All-Rail Receipts Soar With Delay of Water Cargoes

Heavy Weather Responsible for Tardy Arrival of Shipments from Hampton Roads—Industries Have 60-90 Days' Supply — Will Rely on Non-Union Fields in Event of Strike

New England feels a slight impetus to the spot coal market. Receipts, largely Southern coals, are heavier than in recent weeks. Heavy weather held up Hampton Roads boats early this month, and this accumulation is just getting in.

All-rail shippers were quick to take advantage of the forced lull in water receipts and higher marine freights, which accounts for substantial gains in all-rail tonnage.

Many manufacturers now have 60 to 90 days' supply on hand and the general disposition is to rely on non-union receipts to see this market through the strike period. Indications, therefore, are that buying in March will be less active than during the last 30 days.

There is a fair amount of cautious buying, but most of the purchases are of Pocahontas and New River coming forward by the water route. The textile, paper, and shoe trades are all suffering from light business and it is quite probable that with reserves now being accumulated there will be less buying of coal in March than in February. In several instances lately mill buyers have turned down offers that they were accepting a fortnight ago. In other words, coal is now being received here at a rate much faster than current consumption would require.

Rates of freight coastwise from Hampton Roads continue reasonably firm. As high as $1.25 has been paid for smaller sized steamers for one or two trips, but even at that rate, if sustained for a time, there will be enough other bottoms put into service from fleets now tied up to make rates react. Along the Sound where there is still a great surplus of small barges from New York there has been no change in freights, 70c. being still the open rate to Providence.

The number of plants equipped with mechanical stokers is now large enough to make a fair demand for smokeless slack and requirements of this kind supplement very nicely the somewhat increasing inquiry in the West for prepared lump and egg, especially from the Pocahontas field.

Grades from central Pennsylvania meet with only a slightly better demand. Producers of some of the quality grades report more inquiry and enough business to run three and four days per week, but there is no snap and it is only by constant plugging that orders are secured.

Should marine freights advance another 10@15c. or even hold where they are, there would soon be a tendency to enlarge somewhat in New England the outlet for Pennsylvania coals all-rail. The Connecticut River has heretofore been the dividing line, at least since 85c. freights from Hampton Roads were first quoted 60 days or so ago, but there is enough good coal available in Pennsylvania and Maryland to make an impression in this now contested territory.

Anthracite

Domestic Yard Stocks Retailers Lag in Ordering

Seasonable Weather Enlivens Retail Distribution—Retail Supplies Will Be Much Reduced by April 1—Independent Operations Heavier—Steam Coals Very Active.

Retail distribution of hard coal is progressing actively, following more seasonable weather. As has been the case all winter, however, the householder is buying only in small lots. Yard stocks of domestic coal are dwindling, as retail dealers are not ordering freely for replenishment, and it is evident that Aprli 1 will see retail supplies much reduced.

Independent operations are heavier, but domestic prices obtained are at best only on a level with winter schedules of the larger producers. Steam coals are very active and premiums are easily obtained.

PHILADELPHIA

Retail buying recently has been fair. The buying continues to be in small lots, however.

Some of the retail yards have also developed an extensive trade supplying the peddlers, which business was looked at somewhat askance during former years. There is now more coal being bought in this way than ever known heretofore.

Retail stocks are decreasing, as dealers are ordering lightly—just about sufficient to keep ahead of current demand. The strike question has yet failed to exert any influence on the consumer, who seems to view the subject with entire indifference.

With one of the companies trying out a "range" size—a mixture of nut and the larger pea coals—the latter is eliminated entirely as a domestic size.

It is in the steam coals that strike talk is making itself felt, and on this account buckwheat and barley are in particularly lively demand. Independents seem well able to move these two sizes at close to company prices. Demand has been so brisk that the companies are beginning to pick up some coal from the storage yards.

NEW YORK

With buckwheat in better movement than pea, and the other domestic and steam sizes in good demand the anthracite situation shows improvement. Stove coal, which a few weeks ago was active is now the hardest to move but has not yet become a drug on the market. Pea coal is regarded as hopeless.

With the backbone of winter practically broken dealers are not taking any more coal than they deliver on orders. Consumers for the most part are buying in small lots, although many are filling their bins instead of placing their orders for next winter's fuel in April.

Independent coals are moving rapidly but are not bringing premiums. Pea is the drawback of the independents as with the companies. It was said that some of the companies were making concessions to their customers in order to move their tonnage.

Offers of washery coals were reported at quotations ranging around $6 for chestnut, $4 for pea and $3.15 for buckwheat.

The steam situation is causing some serious thinking. Buckwheat is still plentiful but this is due to the tonnage being removed from storage piles. Rice is moving quietly. Barley is the shortest of the three sizes. Most producers have the major portion of their present output on contract, leaving little for spot buyers.

BOSTON

Retail stocks have begun to show the effect of sustained cold weather and there is in consequence a better demand for domestic sizes. There is a disposition to keep closely in touch with the wholesale market and to order coal forward in prudent amounts. Buyers are advising their trade to make sure of supplies for March and April, or through to the end of the present season, but not yet has there been any concerted demand for another season's coal.

Independent quotations are somewhat firmer because of strike talk, but we have not yet heard of a rush for coal in any direction.

BALTIMORE

Except for a brief spurt, demand has been below normal, despite the fact that there has been less coal in cellars this winter than for a number of years past. The supply in yards here is now entirely sufficient to meet all conditions. Indeed one or two of the larger dealers who have large stock on hand are growing a bit nervous as they figure that spring will catch them with considerable stock still on hand unless there is a decided cold spell.

ANTHRACITE FIELDS

Improvement in the situation is lacking. The Glen Alden Coal Co. closed all of their mines for the last two days of the week. The Pennsylvania Coal Co. has announced an indefinite suspension of six mines in the Pittston region.

The prospect of a strike does not seem to increase the orders for anthracite. This tends to confirm the fact that there are large stocks of coal throughout the country.

BUFFALO

Colder weather is the chief reason for some improvement, yet at the same time the trade is saying that winter is not going to be severe and it will soon be going altogether. It is generally supposed that the consumers have less coal in their cellars than they had a year ago and that they must buy more heavily as spring approaches.

Independent mines have put up their prices half a dollar or so, and are now getting circular prices or a little more. If the rest of February turns cold the premium will run up some.

There is no move yet to load coal to the Lake. Shippers are not certain what is best to do. They have the coal, but some predict that there will be too much coal carried over at upper ports to warrant rushing any up there next spring. So it may be best to wait till most of the winter demand is known.

Coke

CONNELLSVILLE

The coke market has been stiffening sharply in the past few days. Operators are less ready to sell since there is a broader market than formerly for coal. Right along prices have been better in the coal market than in the coke market, but it has been somewhat difficult to sell coal. Demand for foundry coke has definitely increased, probably due to a desire to stock coke. The spot furnace coke market is easily higher than the range quoted a week ago, $3 being probably the minimum at which any really good coke can be had, and even then the offerings would be limited. Foundry coke still ranges $3.75@$4.25, but there is only a little to be found at $3.75. Contract prices are not quotable, there being no inquiry, but operators certainly would not sell now at prices made a month or more ago.

The *Courier* reports coket production in the week ended Feb. 4, at 57,230 tons by the furnace ovens and 32, 960 tons by the merchant ovens, a total of 90,190 tons, a decrease of 160 tons.

UNIONTOWN

The coke market became unexpectedly strong last week due almost entirely to the blowing out of a substantial number of merchant ovens two weeks ago. Furnace coke of standard quality as a result became hard to locate for spot purchases.

The furnace coke demand and output have been brought so close together that the blowing out of some ovens became immediately noticeable. The only explanation advanced was that operators had learned the number of ovens needed to fill their contracts and were restricting their output to that number.

Talk of the impending coal strike several weeks ago started all sorts of speculation here as to its probable result on the unorganized fields. Operators are "sitting tight" awaiting developments. Most of them, however, are shaping their plants for capacity production if needed.

The spot market is unchanged. Sewickley vein steam coal is quoted at $1.35 and Pittsburgh steam at $1.50. Byproduct has a range of $1.60@$1.80.

BUFFALO

Demand is light, but jobbers sell a little now and then, where a factory has no regular supply. Contracts and local byproduct plants furnish about as much as is needed. The local shipper is mostly waiting for an increase of demand when business is better. Prices are steady at $4.35 for Connellsville foundry, $3.15 for furnace and $2.75 for stock, with some domestic sizes at $3.75, to which add $3.64 for freight.

Eastern Inland

Industry Improves; Orders and Inquiries Increase

Much Stimulation Attributable to Strike Talk—Stocking of Coal Is Gaining—Low-Price Levels Disappear — Non-Union Fields Obtain Most of the Business

The current market in the Eastern Inland section hinges on the developments in the strike situation. Stocking of coal in anticipation of trouble is gaining way and the former low-priced levels have about disappeared. A price boom is not likely, however, as too many mines are only awaiting a heavier call to resume work.

While much of the stimulation is due to the strike talk, better industrial conditions are responsible for some increase in orders and inquiries. The competitive non-union fields are securing much of the business offering.

CLEVELAND

Large consumers remain to be convinced that the prospective coal strike is to result in a prolonged interruption of production or a violent advance in prices. Operators are divided in their opinions upon the course of the market over the next few weeks. Some have now come to believe that no rush of consumers into the market is to be witnessed, as the restricted industrial activities, the feeling on the part of users that the strike will not be serious and the fact that consumers are betting upon lower freight rates and coal prices may prevent much buying.

Industrial conditions are slowly improving. One of the large steel companies with headquarters in Cleveland announced that sales in January were the largest in many months. This reflects some expansion in miscellaneous manufacturing activity, which in turn means larger coal consumption.

Railroads are not expected to do much more buying for storage purposes in anticipation of the strike. Many of them, it is believed, have adequate supplies on hand. Retail dealers also are buying closely despite the strike outlook. Warm weather is approaching they do not want to be loaded up with heavy stocks.

COLUMBUS

More activity is being shown in all directions, but especially in steam grades. Buying is going on mostly for immediate wants, but some purchasers are keeping an eye on the future and are buying to forestall a suspension after April 1. In the immediate market for Ohio coal there is no especial stimulation yet apparent because of the threat of a strike.

Public utilities are buying fairly well. There is a gradual expansion in manufacturing along certain lines and this should be reflected in better demand for fuel soon.

The domestic trade is still rather brisk, but the higher temperatures have taken the edge off the market. Retailers have only a fair tonnage on hand but they are not inclined to stock up much under the circumstances. Retail prices are not advancing but there is less cutting reported.

BUFFALO

The situation hinges entirely on the prospect of a long shutdown in April. Many factories are waking up pretty fast now, as the increased mining of coal lately shows. It is predicted that most of the consumers who are not well stocked will buy more liberally from now on.

It is hard to say how large a proportion of the consumers are without a supply that will last them through the period of wage fixing. That is something that they are not anxious to disclose. Prices show firmness at $2.75 for Youghiogheny gas lump, $2.50 for Pittsburgh and No. 8 steam lump, $2.25 for Allegheny Valley and other mine run and $1.50@$1.75 for slack, adding $2.36 to Allegheny Valley and $2.51 to other coals to cover freight.

DETROIT

Moderating weather has lessened the interest of domestic buyers. The business recently done assisted in reducing retail stocks but did not continue long enough to be productive of much business for the jobbers and wholesalers.

The steam coal branch is even more uninteresting. Consumers are doing little buying. So far, their attitude in reference to the possibility of an extensive strike at the mines, in connection with wage readjustments, is generally apathetic.

Smokeless lump and egg is offered at $3@$3.25; mine run, $2.15; nut and slack, $1.25. Four-inch West Virginia lump is $2.60@$2.75; two-inch lump, $2.25; egg, $2; mine run, $1.65; nut and slack, $1.25. Ohio 3-in. lump is $3; inch-and-a-quarter lump, $2.75; egg, $2.25; mine run, $1.90; nut and slack, $1.60. Pittsburgh No. 8, inch-and-a-quarter lump is $2.35; three-quarter lump, $2.25; mine run, $2; nut and slack, $1.65.

PITTSBURGH

In the past week inquiry has continued to increase, and in rather marked fashion. The Pittsburgh district has been able to sell but little coal, its prices being, as for months past, quite out of line with those made by adjacent open-shop fields. That region is selling considerably more coal than a week or two ago and its prices are stiffer. There is no general advance, but the extreme or sacrifice prices have practically disappeared.

Buyers are not particular to state whether they desire additional coal on account of having increased consumptive requirements or wish it for stocking purposes. The coal trade assumes that the increased demand is chiefly for stocking purposes, against the generally expected mining suspension. The steel industry is running about 20 per cent heavier in tonnage than in December.

There are no definite developments in the wage matter. The common opinion now is that the check-off will be the chief point at issue. It is believed that while all the union officials are strongly committed to the check-off and would not consider any scale without it, the majority of the men are either lukewarm or are definitely opposed to the check-off.

Steam slack is $1.30@$1.50; gas slack, $1.60@$1.70; steam mine run and ordinary gas, $2.10@$2.20; ¾-in., $2.60@$2.70; Panhandle 1¼-in. domestic, $2.75@$2.90; high-grade gas mine run, $2.75@$3.

EASTERN OHIO

Production rose sharply during the week ended Feb. 4. Total output amounted to 359,000 tons or 57¼ per cent of potential capacity, an increase of 40,000 tons.

There is no longer any doubt but that the larger consumers have begun to stock in anticipation of mine-labor difficulties. The major portion of this reserve fuel has so far gone to public utilities and railroads, but operators have advised their customers that if they contemplate storing any fuel, they should begin immediately. This is based on the reasoning that once the storage movement gains momentum, it will result in a stiffening of prices.

Barometer reports from industrial centers continue to be slightly optimistic except that conditions in iron and steel are not improving to the extent that had been expected for this time of the year. The possibility of a coalition between miners and railroad employees, even though considered remote, is nevertheless a potential source of anxiety to buyers. Industrial plants have about 30 days' supply on hand and it is expected that a healthier demand will arise from this quarter.

The passing of extreme cold weather has resulted in some let-up in buying on the part of retail trade. With the increased production, slack has become more plentiful.

Receipts of bituminous coal at Cleveland during the week ended Feb. 4, amounted to 1,590 cars, maintaining the high figures of the past few weeks. Industries received 1,134 cars, an increase of 122 cars over the previous week.

TORONTO

Anthracite business has been only moderate owing to unusually mild weather. There are good supplies of all grades on hand. There is a slight improvement in the demand for bituminous, as some plants are now beginning to resume activity.

Quotations are as follows:

Retail	
Anthracite egg, stove and nut	$15.50
Pea	14.00
Bituminous steam	$9.25@9.75
Domestic lump	11.25
Cannel	16.00
Wholesale—f.o.b. cars destination	
¾-in. lump	7.00@7.75
Slack	6.00@6.75

North Atlantic

Orders Below Expectations, Though Inquiries Are Heavy

Coal Market Shows Marked Stimulus—General Tone Is Better—Industrial Activity Lags—Prices Firm, Even on Poor Grades.

Inquiries are heavy although actual orders are not so numerous as had been expected. However, a distinct stimulus has been felt in the coal market. The general tone is much better and good grades are being booked ahead wherever operators will take on this business.

Industrial activity still lags. Prices are firm on all coals, except for the screened gas varieties, which are in heavier volume due to the demand for slack. Tonnage at New York piers has been reduced but it is understood that there is considerable coal on the way on consignment.

NEW YORK

The market is stronger but demand is not active. Many inquiries are received but actual orders based upon them are scarce. The general tone is better and the prospects indicate a period of good business.

Producers and shippers of the better grades are heavily booked and some of the houses, having none of their own coals available for spot sales are about being forced into buying other coals. Quotations show a rising tendency.

The outcome of the Indianapolis convention will, it is thought, have a decided bearing on future conditions and may result in heavy buying between now and the time set for the expiration of the wage agreement. The railroads are taking more stock in anticipation of trouble.

UPPER POTOMAC

If anything, greater idleness prevails in these fields. Mines are unable to run profitably at current prices and it is impossible for the producers to take on any business as long as mining costs are as high as they are at the present time.

PHILADELPHIA

The slight show of strength recently apparent is maintained and if anything the buyer is showing a greater interest. A good percentage of recent purchases have been for other than current consumption.

There has been no real buying as yet by railroads. Of course, they are putting a little fuel into stock in excess of consumption, but are not in a rush about it and price must be right, according to their way of thinking. The industrial situation seems to be at a standstill.

It is no easy matter to record market prices, as there is so much difference of opinion. There can be no question that producers are anxious for higher prices and when merely asked their opinion as to the market, with no particular sale in view, are likely to get them high enough. We believe on the whole that there has been no real changes during the past week.

BALTIMORE

February trading has not been as brisk as the closing days of January, when a number of consumers came into the market apparently to store coal. The strongest feature has to do with the Pennsylvania and Western Maryland producing districts, where some of the specialized steam coals are holding up fairly well.

A very weak point is in connection with the Fairmont gas productions. There is a certain demand for slack, but it has to be sold on a low level. Nobody seems particularly interested in three-quarter, which, left over after screening for slack demand, has to be sold as run of mine.

The export movement continues flat, although February should on present figures run ahead of January. For the first week in February, two vessels cleared with a total of 6,632 tons cargo and 450 tons bunker.

CENTRAL PENNSYLVANIA

Stocking of coal has resulted in creating a temporarily lively market for fuel and the first few days of February witnessed a greater production than for some time. Coal operators are still working on the old adage that small orders are thankfully received and larger ones in proportion.

Coal has been placed on the preferred shipment list and many mixed trains are now being made up. This is an extraordinary situation and the only question now is, how long will it last.

Operators are not all agreed on the outlook, some contending that the demand will increase as April 1 approaches and that the month of March will witness strong buying. No break has been announced in prices and most operators are ready to put more men into the mines if occasion demands.

FAIRMONT

A slightly heavier line of orders is coming because of strike developments. Much of this emergency business is being placed with lower-cost mines. With decided uncertainty prevailing as to the future rate of wages, producers are not in position to make contracts for the new coal year at this time.

Chicago and Midwest

Stocking Against Strike Stimulates Production

Mines Fall Behind on Domestic Orders—Railroads Have 60 to 90 Days' Supply in Storage—With Industrial Consumption Heavier Trade Is Optimistic

For the first time in months mines are behind on their domestic orders. Production has been greatly stimulated and steam sizes are well taken because of the growing desire of buyers to be protected over the strike period. Non-union coals are active and prices have risen. Railroads have been quietly laying in a surplus and now have from 60 to 90 days' supply.

The market is very skittish, with a distinctly upward trend to all forward quotations. While the strike talk is responsible for most of the better demand, industrial consumption is heavier and coal men are optimistic of future conditions after the wage question has been settled.

Seasonable weather has caused the coal market to respond, developing a better call both in the steam and domestic grades.

Out in the country the demand for domestic coals remains steady. Eastern coals continue to be popular and quotations on West Virginia and Kentucky block advanced during the last week. Pocahontas also stood for a slight increase. Franklin County and other high-grade southern Illinois coals are holding very steady.

Buyers all require prompt shipments and pester the operators for car numbers. As a result, there are actually a few mines in both Indiana and Illinois who are now a little behind on their domestic orders.

Steam coals are strong, especially the different sizes of screenings. Prices have advanced all along the line. Both operators and sales agents are circularizing trade very heavily with literature relative to the threatened shut-down on April 1. The demand for steam coals is slowly but surely improving every day.

Taking all in all, the general tone is much sounder than it has been for a long time and coal men are, consequently, more optimistic. These optimists in the coal industry are basing their predictions for better times on the fact that unemployment is on the decrease according to the United States Department of Labor; that the stock market is showing very much better trend; that the railroads are slowly but surely doing a better business; that foreign exchange is improving, and lastly that the farmers are getting a little more money for their produce. Taking all these matters into consideration, the coal man believes that there are better times in store for him as soon as the trouble which threatens the first of April is out of the way.

CHICAGO

The Chicago market is on the mend as all grades of coal are holding steady, with prices slowly but surely climbing to higher levels. This is brought about by the cold weather we are having, by the uncertainty of the strike situation and by some slight improvement in the industrial situation. Industries which have been in a dormant state for six months are now showing signs of activity and are planning on opening up very soon.

Steam coals are now active, although very few of the large industrial users are buying much for storage purposes. One curious development of the steam coal market during the past week or ten days has been the marked demand for screenings from non-union mines. West Virginia and eastern Kentucky operators are receiving many inquiries, calling for prices on 200 to 400 carload lots to move forward in regular equal weekly shipments between now and the first of April.

None of the railroads have stepped into the market to make any large purchases for storage purposes. Most of the railroads contracted for more coal last year than they actually have been able to use. As a result, they have been very quietly accumulating a surplus at various central points, so that in case there should be a strike nearly all of our roads are in shape to go 60 to 90 days at their present operating rate without purchasing additional coal.

Prices at the mines on domestic coal show a slight upward tendency. This is not noticed in Franklin County but on some of the other Illinois coals which have been selling below the Franklin County levels. Now that the demand is a little better, these operators are trying to bring their prices up more in line with the prices being obtained for the best grades of southern Illinois coal. Pocahontas mine run also increased. Kentucky block, which was offered a week or so ago very freely at $2.25, has completely disappeared and it is now difficult to place business calling for prompt shipment at $2.50 or even $2.75.

LOUISVILLE

The market is as nervous as a thoroughbred at the wire. Producers are watching closely for opportunities to secure better prices, and jobbers are afraid to take business without first getting it accepted by the mine. Producers do not care for period business and the market is getting into a strictly spot channel

The market is so nervous that everyone is afraid apparently to close any business that is not for immediate shipment. Stock rolling is to be had at old prices, but on new inquiries prices are higher than they were a week ago, except on lump and some lower grades of mine run.

Many mines in eastern Kentucky are operating on a very fair-time basis. Reports from railroad men and trainmen are to the effect that considerably more coal is moving.

On some of the inquiries now coming the concern placing the inquiry gives the seller to understand that no contract will be considered that has any clauses relative to miners or railroad strikes, car shortage, etc., and specifying deliveries over periods of several months. Of course no one is interested in such inquiries.

It appears as if the market will continue unsettled until something definite is known concerning the threatening strike. If it is certain there is a strike —it looks like stiff prices. As a rule the trade sees nothing in sight but a strike, considering the attitude of coal miner and producer.

ST. LOUIS

Seasonable weather prevailing in the territory has kept the retail movement of coal in pretty fair condition but, as usual, it is in small lots and calls are for the cheaper grades. Standard seems to be in the lead, with Mt. Olive a close second and Carterville trailing along third, with very little demand at all for hard coal, smokeless or coke, although coke moves in a greater tonnage than the hard coal and smokeless combined.

Dealers all report heavy stocks of high-grade coal on hand and little, if any, high grade, will be bought for storage against a possible strike. Mt. Olive does not store well and such as will be put in will come in just previous to April 1, if it is obtainable, and, if not, then Standard will suffice.

Some small manufacturing plants are gradually acquiring a little storage supply of a couple of weeks or a month, but storage in general has not been provided for in St. Louis as it has been in Eastern cities.

Country demand has been fairly good for the cheaper grades. This has been somewhat scattered and no country dealer feels like storing in great quantities.

A fairly good movement has been noticed through this gateway to Omaha and Kansas City and considerable steam tonnage is being moved to Chicago from the Standard field. Otherwise conditions are quiet and there is no change in prices.

SOUTHERN ILLINOIS

Railroads are taking a little Carterville for storage but in a general way it is not what it should be. There is some storage moving to the North through Chicago but this is in small volume compared with other strike years. All mines have an abundance of all sizes on hand.

There is nothing to indicate that there will be any marked change unless something drastic and definite pertaining to the strike becomes public.

Domestic demand is unusually quiet even though cold weather prevails. There has not been much change in prices since last week. Some coal has been offered as low as $3 from a mine in Williamson County, which is supposed to be controlled by one of the leading members of the operator's association.

The general state of affairs in the field is far from satisfactory from the viewpoint of the operator and the miner. So little coal is being shipped over the Missouri Pacific that coal trains which used to move out at the rate of two or three now go at the rate of one or two per week.

Conditions in the Duquoin and Jackson County fields are somewhat similar to those in the Carterville field as to price and working time. The Mt. Olive situation shows little improvement even though cold weather is here. There is some domestic demand both in St. Louis and Chicago, as well as Kansas City and Omaha, but it is not in the volume that it should be. There has been no change in price since last week.

Standard conditions are unchanged. There is a surplus of all sizes but the railroads have helped to some extent in the matter of storage coal. Industrial storage coal does not seem to materialize and just enough coal is moving, it appears, for current needs. The domestic call in the country is fairly good on 2-in. sizes. The mines throughout the field average about three days a week, with several of them idle.

WESTERN KENTUCKY

Unsettled weather is making for an uncertain demand for prepared coal, but production as a whole is light. Mine run is not moving especially well. Pea and slack is hardly to be had, as operators, while refusing contracts, are able to ship production as fast as mined.

While some of this demand is from consumers who are stocking up for fear of advancing markets and inability to secure supplies, if the strike comes off, there is also a steadier demand for immediate consumption in industrial plants which are on a slightly better basis. Railroad consumption is also reported to be showing a shade better.

Announcement has just been made that through rates have been published from western Kentucky mines to the Southern Peninsular of Michigan, the rate being 25c. a ton over the rate from southern Illinois, and affecting several hundred points.

South

BIRMINGHAM

Overlapping rainy and cold weather is keeping up a fair demand for household coal. Most retailers still have a good supply on hand and are not anticipating placing further orders. Hence short-time operations are still the order at the mines.

No change is noted in the steam situation. Although progress upward in industrial channels is seen, the pace is a slow one and has not so far proven beneficial in increasing commercial consumption. Orders are still of small volume and intended to supply immediate needs. Railroads and utilities are taking their minimum or less in most cases. The Southern has increased its quota from this district since the expiration of contracts in another field, which is giving contract mines slightly better working time.

Wage adjustments either have been made effective or will be made at practically all mines in the Alabama field this month, and with the advent of better demand business in the coal industry should go forward without interruption.

VIRGINIA

The slight spurt in demand which is noticeable is not due so much to any improvement in industrial conditions as it is to the fear of a strike. More than 60 per cent of potential capacity is being produced. Mine run is stiffening in price and is now quoted better than $2 but lump is unchanged at $3.

News Items From Field and Trade

CONNECTICUT

The R. C. McNeil Co., Bridgeport, filed a certificate of incorporation recently to deal in coke, coal, ore, etc. The capital stock is $100,000. Roderick C. McNeill, head of the company, is one of the officers of the Karm Terminal Co., Bridgeport, wholesale and retail coke and coal dealers.

The Mill River Coal Co., New Haven, recently filed a certificate for the reduction of capital stock from $100,000 to $25,000.

The Smith-Pearsall Co., Inc., Hartford, recently filed a certificate of incorporation to handle coal, lumber etc. The capital stock is $200,000, and the officers are: H. E. Pearsall, vice-president; S. F. Westbrook, president; H. M. Guernsey, treasurer; E. W. Smith, secretary and assistant treasurer.

The Citizens Coal Co., Inc., New Britain, is having a large coal pocket and elevator built at the coal yards in that city.

ILLINOIS

H. H. Taylor, president of the Taylor Coal Co., Chicago, was in Herrin recently, looking over the company's property in that vicinity.

Vice-president Jenkins of the **Consolidated Coal Co.**, has estimated that it will cost the company between $100,000 and $150,000 to complete the job of pumping mine No. 9 at Murphysboro. The mine was flooded early last December when a large hole fell through the bed of the Big Muddy, the water reaching a height of 15 feet from the top of the shaft. Shortly after the disaster occurred it was rumored that the company had decided to abandon the mine owing to the great difficulty of pumping. However, pumps were immediately set to work and have at this time made much headway. It is estimated that the work will be completed in about four or five more weeks.

W. E. Rutledge, president, of the Security Coal & Mining Co., Chicago, with mines in southern Illinois, was in that region recently attending to business for the company.

The following itinerary has been announced for February for the **Illinois Mining Examining Board**; Duquoin, 14th; Staunton, 15th; Springfield, 16th; Lincoln, 17th; Danville, 18th; Peoria, 20th, and Spring Valley Feb. 21.

The Riverton Mine at Springfield has been again put into operation by the **Springfield District Coal Mining Co.** The mine employs in the neighborhood of 300 men.

J. M. Dillavou, of Chicago, was a visitor at various points in Illinois recently, inspecting mines which belong to the Harris-Dillavou-Dimond Co. The company, which is a comparatively new concern, has acquired large operations recently in the Franklin and Williamson fields.

The Sincerity Coal Co. of Chicago has contracted with Roberts & Schaefer Co. for the complete installation of shaker loading booms in the tipple at Marion.

The Union Colliery Co., operating the Kathleen Mine at Dowell, recently tendered the officials of the mine a banquet at Duquoin The affair was under the management of Eugene McAuliffe, of St. Louis, who is president of the company and general manager of the mine. The guests included Superintendent George Snedden, the mine manager and his assistants at the mine, E. F. Stevens, of St. Louis, auditor for the Union Colliery Co., and Dr. Young, consulting engineer for the Union Electric Co., St Louis.

INDIANA

The case of **Harry S. Frank**, a Cleveland, Ohio, broker, against the **Rowland Power Consolidated Collieries Co.**, at Terre Haute, was dismissed in Federal Court in Indianapolis recently on motion of the plaintiff. The motion to dismiss came after considerable progress had been made in the trial of the case. The suit was instituted to recover $6,700 said to be due in service in selling $600,000 worth of bonds of the company.

Seven hundred miners of the **Clinton Coal Co.**, at Clinton, will abide by orders of John Hessler, president of District 11, U. M. W. of A., to continue their strike in protest against the discharging of a pumper by the company last October. The miners will be able to continue their strike, since they have received financial aid from other locals in District 11. Some miners recently said at a meeting that unless the district officials and operators reached an agreement, or the miners received financial aid, they would return of their own accord.

Reassessment of coal properties in Clay County are as follows: Bays Logan Coal Co., Sullivan, total increased from $6,135 to $12,000; Bolt Coal Co., Coalmont, total reduced from $59,030 to $34,030; Brazil Collieries Co., Brazil, total reduced from $118,000 to $102,440; Brazil District Mining Co., Brazil, increased from $19,650 to $25,190; Carbon Mining Co., Carbon, personal increased from $35,145 to $46,535; Otter Creek Coal Co., Brazil, total increased from $1,920 to $88,610; Primrose Coal Producers Co., Indianapolis, total increased from $29,385 to $56,045; Rowland-Powers Consolidated Collieries Co., Terre Haute, Posey Township, personal reduced from $168,620 to $143,715, Harrison Township personal increased from $72,359 to $82,840; South Side Coal Co., Coalmont, Lewis Township, reduced from $10,000 to $9,645; United Fourth Vien Coal Co., Linton, reduced from $6,070 to $3,080.

Indiana coal mines produced 22,773,444 tons during the fiscal year which ended Sept. 30, according to the annual report of **Cairy Littlejohn**, chief deputy state mine inspector. The production was distributed as follows: Machine-mined block coal, 57,475 tons; pick-mined block coal, 27,863 tons; machine-mined bituminous coal, 11,696,893 tons; pick-mined bituminous coal, 10,039,520 tons, and strip-mined coal, 951,693 tons. Mines worked an average of 148 days during the year. The number of days of employment lost by miners for various causes is as follows: No orders at mines, 20,480 days; no cars, 2,282 days; strikes, 1,178 days; funerals, 50 days; suspensions, 637 days, and other causes, 4,833 days.

A contract, which will amount to probably 300,000 tons, taken in the next twelve months, has been made by the **Eureka Coal, Co.**, for the coal mined at its mine, eleven miles south of Terre Haute, with the Chicago & Eastern Illinois R.R.

The Miami Coal Co., operating four mines in the Clinton field, has signed a pledge to give $10,000 to the Vermillion County Hospital and the **J. K. Dering Co.**, with two mines, has signed a pledge to give $7,000. **H. M. Ferguson**, president of the Clinton and the Ferguson-Spears companies, had signed to give $10,000.

KENTUCKY

Eight men were killed, two badly injured and one is missing as the result of a mine explosion, which recently wrecked a mine of the **Marietta Coal Co.** on Pond Creek, Pinson Fork.

A petition in bankruptcy has been filed in Federal court by the **Boyce Coal Co.**, of Madisonville. The company lists its assets at $40,332.90, and liabilities at $31,101.73. Among the liabilities there is a claim of $3,357 due to coal miners.

The Clifton Coal & Lumber Co., Louisville, capital $30,000, has been chartered by A. J. Corey, Frank Gernert and B. A. Doyle. The company has a yard at Crescent Hill, on the eastern yards of the Louisville & Nashville. The same interests are connected with the Corey-Sheffel Lumber Co.

The Calhoun interests, of Frankfort, composed of Patrick Calhoun, Sr., and his sons, Patrick, Jr., Andrew and George, plan to start work on a coal station at Louisville shortly, having leased from the city and Pittsburgh Fuel Co., a strip of land on the Ohio River. It is planned to install a series of switches at graded levels, and arrange to transfer coal from barges to rail, and to elevator, bringing coal in from Kentucky and Ohio River points, including eastern Kentucky and West Virginia coal. It is planned to purchase river equipment, and transfer and distribute by rail from the Louisville plant at a considerable saving in freight costs.

The Black Diamond Coal Mining Co., of Drakesboro, recently installed a set of automatic cagers.

MINNESOTA

W. E. Le Blanc, for six years sales agent of the Clarkson Coal Co., at Duluth, has resigned and gone to make his home in Los Angeles, Cal.

J. A. Howe, vice-president and general manager of the Carnegie Dock & Fuel Co., was in Duluth recently on an inspection tour of the company's docks.

W. A. Prinsen, secretary of the Northwestern Coal Dock Operators' Association, Minneapolis, has been in the East for some time.

A new incorporation in Minneapolis is the **Leighton Fuel Co.**, capital $50,000. The incorporators include G. A. Leighton, president; R. A. Leighton, vice-president and treasurer; and J. F. Buchanan, secretary.

NEW YORK

C. R. Stahl, of the E. E. White Coal Co., at Glen White, was in attendance at a meeting of the smokeless people at New York on Feb. 8 and 9.

The Chillingworth Engineering Corporation has associated with it **Frank H. Plum, Herbert Pisemer, George E. Mellin and Harold von Thaden**, formerly of the C. W. Hunt Engineering Corporation, and will carry on a business of a character similar to that conducted by the C. W. Hunt Engineering Corporation. It will occupy offices at 143 Liberty St., New York.

Justus Collins, of Charleston, head of the Collins companies in the southern part of West Virginia, was a visitor in New York City during the meeting of the smokeless operators.

Swindle of coal companies in various cities of $500,000 by worthless credit ratings was revealed by Federal authorities following the arrest in Cleveland of two accused as members of a band of fraudulent coal brokers in Brooklyn. The men, registered as Frank L. Matthews of Chicago and Matthew Luther of Brooklyn, were arrested following an investigation lasting nearly a year. The men are alleged to have operated a coal and material company and to have represented it as a branch of a company in Brooklyn. After ordering a shipment of coal, a representative of this company would intercept it in transit and have it reconsigned to another city where, it is said, it would be sold for cash.

The Fulton Coal Co. has been incorporated to transact business in New York City. It has a capital of $20,000. The incorporators are given as F. H. Borman and J. C. Brown.

OHIO

It is said that Governor Davis' recent request upon various municipalities and other public bodies to burn only Ohio coal, is meeting with favor. The Board of County Commissioners of Cuyahoga County is shortly to pass upon resolutions in this connection, one of which calls upon individuals resident in Cleveland and Cuyahoga County to use Ohio coal wherever possible. The sole object of the governor's appeal is to provide more work for Ohio miners, who in some parts of the state have worked but a small per cent of the time during the past nine months due to "no market" conditions. One prominent coal operator said that every ton of coal used in Ohio, except in steel annealing furnaces and similar industries, needing anthracite, could just as well be Ohio mined.

The Moore Fuel Co., chartered recently with a capital of $25,000 has opened offices at Columbus, with J. W. Moore, president; Frank Gould, vice-president, and F. J. Leonard, secretary. The company will operate a mine in Perry County and also conduct a wholesale business.

The Big Mandy Coal Co. has been incorporated and its directors have elected the following officers: Charles A. Norton, president; Rush Meadows, vice-president and general manager; John O. Eckert, secretary and H. Ruscka, treasurer. The company will do both a wholesale and retail business. Its offices are located at Cincinnati. Yards are to be opened in the near future.

An involuntary petition in bankruptcy in which the **Riverside Coal Mining Co.**, White Star, Harlan County, Ky., was declared to be insolvent and bankrupt, was filed in United States Court at Cincinnati recently.

What is regarded as a vote of confidence in the administration of John L. Lewis as international president, and Lee Hall, Ohio president of the United Mine Workers, was given at the annual convention of the Ohio organization recently. The action was taken in the form of a refusal to accept a constitutional amendment limiting the appointive power of union officials and followed charges made on the floor of the convention that Ohio officials were operating a "steam roller," and that Lewis had built up a governing machine.

PENNSYLVANIA

The Burgettstown Coal Co. has contracted for additional screening and conveying equipment for preparing and storing nut coal at the Burgettstown Mine.

Harry Barrett Marshall, well-known manager of the St. Louis branch of the Electric Storage Battery Co. has been placed in charge of all railway sales work of the company. Mr. Marshall will be located at the factory in Philadelphia. He has been associated with the company for the past 16 years.

The Imperial Coal Corporation, Johnstown, held its annual meeting recently and re-elected the following officers: President, Charles A. Owens, of New York City; vice-president, James P. Thomas, of Philadelphia and Johnstown; secretary, Frank D. Baker, of Johnstown; treasurer, Philip E. Thomas, of Merion; sales manager, New York, E. H. Zimmerman, of New York; Philadelphia, Harry A. Ling, of Philadelphia; general manager, James M. Cook, of Johnstown. It was stated at the meeting that the mines of the company operated 100 per cent of 300 days during 1921.

The Pennsylvania Water Supply Commission has approved the application of the **Beitz Coal Co.** to build a dam across Panther run in Shade township, Somerset County.

According to notice received at the office of the Secretary of the Commonwealth the **Imbrie Coal Co.**, Butler County, has dissolved.

The Somerset-Windber Coal Co. has filed a complaint with the Public Service Commission of Pennsylvania against the Pennsylvania Railroad Co., alleging that the road has refused to install a siding from its lines to the coal mines of the complainant in Paint township, Somerset County. The complaint states that an agreement had been reached between the parties and that the coal company gave its check for $13,000 to the railroad company for the construction of the siding. The railroad company made application to the Public Service Commission for approval of the proposed siding and for a grade crossing at a township road, the complaint states, but the application was later withdrawn.

The Harrisburg Colliery Co. announces the addition to the staff of A. Bement in an engineering capacity, working in connection with the sales department for the purpose of rendering service among coal producers.

At a meeting of the board of managers of the **Lehigh Coal & Navigation Co.**, held Jan. 25, the following officers were elected, effective Feb. 1: **Henry H. Pease**, vice-president and secretary; **O. F. Neff**, treasurer. The treasurer will report to the vice-president and secretary.

UTAH

J. A. Garcia, mining engineer of Chicago, is examining coal properties in Utah for Eastern banking interests. He expects to return to Chicago about the middle of February.

D. H. Pape, general manager of the Lion Coal Co., Ogden, has resigned. After a vacation in California, Mr. Pape will help to organize a company that will develop coal lands in southern Utah. Mr. Pape is one of the most prominent coal operators in the mountain country.

Utah is to have a state geologist, according to a promise of Governor Mabey. The official has not yet been selected.

According to **L. F. Rains**, president of the Carbon Fuel Co., Salt Lake City, plans are under way for the development of a large deposit of coal in the southern part of the state. Mr. Rains says this coal shows an analysis comparable with the Pennsylvania anthracite and may be offered on the Salt Lake market by next fall. He said the prices would permit of its general consumption. It is hoped that this coal will help solve Salt Lake City's smoke problems.

VIRGINIA

F. H. Wilson, deputy commissioner of the Chesapeake & Ohio Coal Exchange, has accepted the position of general agent at Norfolk for the Chesapeake & Ohio Ry., to succeed J. B. Bell. The office vacated by Mr. Wilson has been abolished.

W. W. Houston, of the Pan Handle Coal Co., is chairman of a committe of five appointed by the Chamber of Commerce to appear before the General Assembly, now in session, and support measures calculated to bring down pilotage charges in Hampton Roads. Many coal men are interested in this move. **J. B. Routteen**, of the Chesapeake & Ohio Coal & Coke Co., and **J. W. Bunting**, of the Tuttle Corporation, have gone to Richmond to appear before the General Assembly on this question.

At the annual meeting of the **Samoset Fuel Corporaton**, with mines in Pike County, Ky., operating under a Virginia charter, which was held a few days ago at Graham, and officers elected for another year. W. J. Cole was again elected as president of the company. Other officers are: H. M. Mitchell, vice-president; S. G. Bralley, secretary and general manager. On the board of directors are W. J. Cole, H. M. Mitchell, R. B. Parrish and W. B. Morton. This company owns valuable coal properties, gas and oil rights in Kentucky.

Melville Cockburn, of the New England Coal Co., has been in Roanoke for a conference with officials of the Norfolk & Western Ry.

WASHINGTON, D. C.

The Interior Department has amended the **coal leasing regulations** by providing that in the case of a lease for a small area where the investment will be $10,000 or less, the lessee shall furnish one bond to cover the investment and compliance with the lease, the bond not to be less than $1,000 and not more than one-half of the value of the investment.

The Geological Survey has restored to entry 200 acres of land in Washington previously withdrawn for coal classification. In December it reported on seventeen applications for coal prospecting permits, a total of 445 reports since the leasing law was passed. The survey also reported on 112 applications for coal leases.

One of the few to escape unhurt from the pit of the **Knickerbocker Theater at Washington** was a man who had spent much of his life as a coal miner. When he heard the ominous cracking which preceded the collapse, he instinctively dashed for an exit because the sound, he explained afterwards, was so similar to that which precedes the fall of roof in a coal mine.

The War Department reports that it cost $150,000 to send troops into the West Virginia coal fields in September and October, 1921, to quell the rioting.

The Postoffice Department requests $10,000 for anthracite and improvements to present equipment which will permit the burning of bituminous coal, decreasing the amount consumed.

For fuel for the **District of Columbia schools** an additional $29,300 is asked and smaller appropriations for other public institutions in the District.

An appropriation of $11,057,610 for fuel for the Navy for the balance of the fiscal year ending June 30 has been transmitted to Congress by the President upon request of the Secretary of the Navy and the Budget Bureau. This is based upon a requirement of $29,000,000 for the year, Congress having appropriated only $17,500,000 at the last session. These arrangements involve a reduction in the activities of naval vessels below the force operating plan and below the point where it is believed naval efficiency can be maintained.

Coal savings are reported by the Budget Bureau through co-ordination between the various government departments. The co-ordinator of the first army corps area discovered that it was costing the army an average of $20 a ton for coal delivered at Fort Adams for use of its vessels operating in that vicinity, and that coal could be supplied Fort Adams from the Navy fuel station at Melville, R. I., at $9.50 a ton. Through the co-operation of the Navy this arrangement was put into effect. The area co-ordinator of the sixth corps area reported that 3,000 tons of coal was on hand at Fort Sheridan, Ill., in excess of requirements. The coal was declared surplus and it was taken by the Chicago postmaster, saving the government $8,160.

Architect Elliot Woods of the U. S. Capitol told the House Appropriations Committee that the cost of coal for heating the building had declined in a year from $8.20 to $7.32 a ton. The coal is purchased from the government fuel yards. Early in the year it cost $9.40 a ton and some was obtained as low as $6.53 a ton. Last year 24,630 tons of coal were burned at the Capitol.

WEST VIRGINIA

A visitor in the Morgantown field a short time ago was **Arch Straub**, of the Straub-Atchinson Coal Co., of Pittsburgh.

In addition to other building activity connected with the mines in the Winding Gulf region, the **E. E. White Coal Co.** has perfected plans for the erection of a modern steel tipple at its large Glen White plant. No time will be lost in erecting this tipple, in connection with which a new hoisting tower is also to be erected. The head of the E. E. White Coal Co. is E. E. White, president of the Winding Gulf Operators' Association.

Work is being pushed on the installation of electrical equipment at the No. 9 mine of the **Jamison Coal & Coke Co.** in the Marion County field near Farmington. Other plants of the same company have been electrified within recent months in the Fairmont region, all with a view to increasing the capacity.

Approximately 50,000 acres of coal land in Harrison, Doddridge and adjoining counties in West Virginia will figure in a deal in which J. V. Thompson of Uniontown, Pa., is a leading figure, the work of securing options on the lands now being under way. The property is being optioned in many instances at the rate of $300 an acre. If the deal goes through, as is expected, the consideration involved will be about $15,000,000, but only 25 per cent of the purchase price is to be paid in cash. Companies said to be figuring in the deal are the **Piedmont Coal Co.**, **Harrison Coal Co.** and the **Doddridge Coal Co.**

A. Hunter Land, of Charleston and Logan, is to retire from the coal business and to enter the lumber business in the West, having been elected treasurer of the Hutchinson Lumber Co., of Sacramento, Cal. Until recently he had been president of the Dickinson Fuel Co., of Charleston and treasurer of the West Virginia Coal Association.

With a reorganization of and an increase in the capital stock of the **Southern Coal Corporation**, of Fairmont, that company will soon enter upon the production of coal, having heretofore been in the business only of selling coal. The concern has acquired a large mine on the Charleston Division of the B. & O. and another mine in Lewis County. Plans are under way to acquire mining properties in the Kanawha and in the Logan fields. Following the reorganization of the company new officers and directors were elected as follows: J. E. Gaskill, of Fairmont, president; C. T. Denly of Cleveland and E. M. Powell of Waynesburgh, Pa., vice-presidents; H. M. Hill, secretary; L. V. Board, Shinnston, treasurer; A. J. Salzer, sales manager. On the board of directors are: C. E. Gaskill, J. S. LeMasters, R. V. Hennen, Pittsburgh; A. J. Salzer and several others prominent in the coal industry of Fairmont and Pittsburgh.

WISCONSIN

The Superior Fuel & Supply Co., of Kenosha, has filed a voluntary bankruptcy petition in the Federal District Court, listing liabilities at $51,856, and assets at $19,960.

The Ajax Coal Co. and the Bell Coal Co. of Pittsburgh; Cleveland Cliffs of Cleveland, who owns a large fleet of boats as well as being the largest owners of ore mines in northern Michigan, and also own and operate coal properties in West Virginia; Bailey-Wood Coal Co., Ragland Coal Co., Anigo Coal Co., Low-Volatile Consolidated Coal Co., Rick Lick Coal Co. Other large stockholders will be producing companies in Kentucky and Tennessee.

An explosion of illuminating gas, due to a leaky supply pipe, demolished the office building of **Pugh Coal Co.**, at Racine, on Jan. 30, causing a loss estimated at $25,000. Wm. Higie, a coal dealer, and L. E. Williams, yard superintendent, were seriously burned and bruised by falling bricks.

Work on a new $10,000 coal "silo" will be started within the next few months in the coal yard of the Harcum Fuel Co., Fond Du Lac.

Obituary

William Wilson, a pioneer coal operator of Missouri, died recently at his home in Richmond, Mo. Mr. Wilson was 80 years old and lived in Richmond more than forty years. He was president of the Wilson & Crawford Coal Co.

T. Percy Bryan, secretary and treasurer of the Gray-Bryan-Sweeney Coal Co., Kansas City Mo., died recently. He had been a sufferer for more than a year with heart disease.

Fred W. Struck of the Struck Coal Co., a pioneer resident of Milwaukee, is dead at the age of 71.

Traffic News

Virtually all of the Western states have started one kind of suit or another to compel freight rate reductions. The battle staged in Washington by the Colorado transportation committee for a reduction in freight rates on many commodities was a concerted drive on the commission. Colorado shippers took the position that freight rates were a hindrance to, and deprived them of profits on all ordinary business. Stockmen, farmers and mine operators alike are suffering from what they claim to be unjustifiable rates. Colorado's demand for a 35 per cent reduction in freight rates charged by Western railroads, was presented by Merle D. Vincent of Grand Junction, attorney for the state transportation committee. All the railroads, particularly those in Colorado, are defendants to the suit.

In a complaint to the I. C. C. the **Pittsburgh Coal Producers' Association** allege unreasonable rates on bituminous coal from mines in the Panhandle group and in Brooks, Hancock, and Ohio counties, West Virginia, to destinations in West Virginia.

The complaint of the **Northern West Virginia Coal Operators' Association**, will be heard by the I. C. C. at Washington, Feb. 20.

In the complaint of the **Smokeless Fuel Co.**, the I. C. C. has authorized the **Leckie Coal Co.**, and the **Interstate Coal & Dock Co.**, to intervene. The case involves demurrage charges on coal for trans-shipment by vessels at Norfolk and Lamberts Point, Va.

In the complaint of the **Michigan Paper Mills Traffic Association**, the railroads ask the commission to authorize the continuance of through routes on coal from L. & N. and C. & O. origins to Detroit via the originating carriers to Cincinnati, Cincinnati Northern R.R. to Jackson and Michigan Central to Detroit, and higher rates at intermediate points and continuance of the route from Ohio and Kanawha districts to Jackson via Pontiac, Mich., and Grand Trunk delivery and higher rates at intermediate points.

The Republic Coal Co., Minneapolis, in a complaint alleges unreasonable rates on soft coal from Logan, Ill., Allais, Ky., and Staunton, Ill., to points in Wisconsin and Minnesota because the railroads sought to impose alleged illegal demurrage charges. The company also alleges unreasonable demurrage charges on anthracite from Pulaski, Va., to Tyler, Minn.

An effort is being made to reduce state rates on coal affecting Iowa railroads. A brief has been filed with the Interstate Commerce Commission by the **Cedar Rapids Chamber of Commerce** setting forth reasons why the reduction should be made.

In a complaint to the I. C. C. the **Central Wisconsin Supply Co.**, of Beaver Dam, alleges unreasonable rates on anthracite from Pittsburgh, Pa., to Pardeeville, Wis., reconsigned to Sparta, Wis. It asks reparation on the basis of the Chicago combination plus $7 for reconsignment.

Trade Literature

U-RE-Lite, the I-T-E Circuit Breaker in The Steel Box—The Cutter Co., Philadelphia, Pa. Pp. 26; 6 x 9; illustrated. Describing the application of the U-Re-Lite for the protection of electric motors, power and lighting circuits from overloading.

The Improved Diel-More Automatic Drain and Relief Valve. The Diel-More Sales Co. Inc., Bourse Bldg., Philadelphia, Pa. A 7-page folder describing the use of the valve, with directions for installing it.

Thermalloy High Temperature Castings. The Electro Alloys Co., Elyria, Ohio. Pp. 6; 8½ x 11 in.; illustrated. Also contains charts showing curves of tests with thermalloy.

Testing that Pays Dividends. The Dorr Co., 101 Park Ave., New York City. Pp. 15; 7½ x 10½ in.; illustrated. Description of the Westport Mill, with information as to the methods employed therein in handling tests and problems.

Steam Turbines and Alternator Units. Allis-Chalmers Mfg. Co., Milwaukee, Wis. Bulletin No. 1119. Pp. 57; 8 x 10½ in.; illustrated. Describes high-pressure single-cylinder units, ranging in size from about 5,000 kw. to 15,000 kw., operating at speeds of 15,000 and 18,000 r.p.m.—Advertiser.

Francke Flexible Couplings. Smith & Serrell, Newark, N. J., general sales agents for The Francke Co. of New Brunswick, N. J. Bulletin No. 32. Pp. 16; 6 x 9 in.; illustrated. Describes the use of these couplings for direct-connected machines.

Trade Standards in the Pump Industry. Recommended by The Hydraulic Society, 50 Church St., New York City. Pp. 19; 6 x 9 in. A useful book to both the pump manufacturer and consumer as it gives the standard trade definitions and customs in the pump industry.

The Brownie Portable Electric Hoist.—Cherry Tree Machine Co., Cherry Tree, Pa. Bulletin No. 2. Pp. 12; 6 x 9 in.; illustrated. Describes small portable electric hoist designed for mine service.—Advertiser.

Stearns Material Handling Methods.—Stearns Conveyor Co., Cleveland, Ohio. Bulletin No. 100. Pp. 15; 6 x 9 in.; illustrated. Among the many appliances described in this bulletin may be mentioned the Cleveland traveling bucket hoist, the Stearns wall winch and the Stearns car mover.—Advertiser.

Recent Patents

Rotary Car Dumper. George N. Simpson, Arthur M. Simpson and Walter H. Simpson, Chicago, Ill., 1,397,936. Nov. 22, 1921. Filed April 21, 1920; serial No. 875,570.

Apparatus for Using Powdered Fuel. Alonzo G. Kinyon, Chicago, Ill., assignor to the Powdered Coal Engineering & Equipment Co., Chicago, Ill., 1,396,761. Nov. 15, 1921. Filed Dec. 11, 1917; serial No. 206,639.

Process of Recovering Coal Held in Suspension from Coal-Bearing Water and Streams. Charles E. Holland, Brooklyn, N. Y., 1,397,735. Nov. 22, 1921. Filed Nov. 13, 1920; serial No. 423,810.

Crusher and Pulverizer. Milton F. Williams, St. Louis, Mo., assignor to Williams Patent Crusher & Pulverizer Co., St. Louis, Mo., 1,397,828. Nov. 22, 1921. Filed Aug. 7, 1919; serial No. 315,893.

Publications Received

A Study of the Effect of Moisture Content Upon the Expansion and Contraction of Plain and Reinforced Concrete. Engineering Experiment Station, University of Illinois, Urbana, Ill. Bulletin No. 126. Pp. 37; 6 x 9 in. Charts and tables.

The Problem of the St. Peter Sandstone. School of Mines and Metallurgy, University of Missouri, Rolla, Mo. August, 1921. Pp. 228; 6 x 9 in. Illustrated; plates and charts.

Coal and Coke Mixtures as Water-Gas Generator Fuel, by W. W. Odell. Department of the Interior, Bureau of Mines. Technical paper 284. Pp. 32; 6 x 9 in. Illustrated; plates and tables.

Gas Mask for Gases Met in Fighting Fires, by A. C. Fieldner, Sidney H. Katz and S. P. Kinney. Department of the Interior. Bureau of Mines. Technical paper 248. Pp. 61; 6 x 9 in. Illustrated; tables.

Gas Producers Trials with Alberta Coals, by John Blizard and E. S. Malloch. Department of Mines, Canada; Mines Branch. Bulletin 33. Pp. 40; 6½ x 9½ in. Illustrated; charts and tables.

The Distribution of the Forms of Sulphur in the Coal Bed, by H. F. Yancey and Thomas Fraser. Engineering Experiment Station, University of Illinois, Urbana, Ill. Bulletin No. 125. Pp. 94; 6 x 9 in. Illustrated; charts and tables.

Annual Report of Mineral Products of Canada, during the Calendar Year 1920. Department of Mines, Canada; Mines Branch. Pp. 80; 6½ x 9½ in.

Proceedings of the National Safety Council. Tenth Annual Safety Congress, held at Boston, Mass. Sept. 26-30, 1921. Pp. 920; 6 x 9 in.

Annual Report of the Director of the Bureau of Foreign and Domestic Commerce to the Secretary of Commerce for the Fiscal Year Ended June 30, 1921. Pp. 148; 6 x 9 in.

An Investigation of The Fatigue of Metals, by H. F. Moore and J. B. Kommers. Engineering Experiment Station, University of Illinois, Urbana, Ill. Bulletin No. 124. Pp. 185; 6 x 9 in. Illustrated; charts and tables.

First Annual Report of the Federal Power Commission for Fiscal Year Ended June 30, 1921. Pp. 239; 6 x 9 in.

Association Activities

Monongahela Coal Association

William E. Watson of Fairmont, is the president of the Monongahela Coal Association that has been organized by the coal operators on the Monongahela R.R. (New York Central System) representing 65 mines with an annual production of 8,000,000 tons of coal a year. C. D. Junkin, of Morgantown, was elected secretary. Other officers of the association are B. M. Chaplin, Morgantown, vice-president; J. B. Hansford, Morgantown, treasurer.

The directors are: W. E. Watson, Jr., Samuel D. Brady, Fairmont; B. M. Chaplin, C. D. Junkin, John Hatfield, Whitney Warner, G. H. Gilbert, A. Q. Davis, W. H. Soper, George S. Connell, W. B. Atwood, Morgantown; John H. Jones Pittsburgh; Joseph Pursglove, Cleveland; Robert Grant, Boston.

The scale committee consists of B. M. Chaplin, J. B. Hansford, John L. Hatfield, John H. Jones, Joseph Pursglove, Samuel D. Brady, W. H. Soper, Robert Grant and R. M. Davis.

Coming Meetings

New England Coal Dealers' Association will hold its annual meeting March 22 and 23 at Springfield, Mass. President, W. A. Clark, Milk St., Boston, Mass.

Northwestern Pennsylvania Coal Operators' Association will hold its annual meeting Tuesday, March 7, at the Wm. Penn Hotel, Pittsburgh, Pa. Secretary, T. F. Diefenderfer, Butler, Pa.

Tri-State Coal Stripping Association's annual meeting will be held March 2 at Wheeling, W. Va. Secretary, G. A. Blackford, Wheeling.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

American Institute of Electrical Engineers is holding its midwinter convention in New York City, Feb. 15, 16 and 17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Institute of Mining and Metallurgical Engineers will meet on Feb. 20 to 23 in New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

Canadian Institute of Mining and Metallurgy will hold its annual meeting March 1, 2 and 3 at Ottawa, Canada. Secretary, G. C. Mackenzie, Drummond Building, Montreal, Quebec, Canada.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Rocky Mountain Coal Mining Institute will hold its next meeting at the Albany Hotel, Denver, Col., on Feb. 20, 21 and 22. Secretary-Treasurer, F. W. Whiteside, Denver, Col.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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No Bridges Burned at Indianapolis

FARRINGTON and Howat defeated and the moderate terms of the scale committee's report seriously modified—what is the portent of the imbroglio at Indianapolis? Is a large section of the miners so obsessed with a false sense of power that it will fly in the face of fate and, in this of all years, seriously attempt to force through such a radical step as a six-hour day and a five-day week? In other words, are the miners really bent on wrecking either their own organization or the coal industry?

We think not. If one gets the proper perspective on last week's convention of the United Mine Workers he sees behind the noise made by the unholy alliance of Farrington's forces with those of Howat and discerns a serious-minded gathering bent on getting itself out of a deep hole. The officials of the miners' union are not fools. They see the handwriting on the wall; they know that coal miners' wages must be reduced.

The great problem of Lewis and his administration this year is to hold the organization together. Many there are who prophesy that the United Mine Workers cannot live through adversity, that the union will crumble under the strain of reversal. To organize the retreat and maintain morale is the task. That is why even while tearing up the earth on the convention floor, the Farrington men were preaching moderation and talking unity among the delegates outside the convention. The delegates have taken home with them a definite feeling of the seriousness of the situation and a knowledge of actual conditions that will have its effect should the proposed referendum on a strike be taken.

A miners' convention without a scrap would not be worth the time of the delegates. From all accounts none was disappointed this year. Farrington, intent on the overthrow of Lewis, hurled the Howat monkey wrench into the machine and for five days there was excitement enough for the most blasé. The deposed Kansas leader had no case. That he made the fuss he did was due entirely to the support afforded by the Illinois leader, actuated not by any feeling of sympathy for Howat but as a means of embarrassing Lewis.

The scale committee reported early Tuesday morning, the first day of the convention. It traveled old familiar ground in many respects, calling for punitive overtime, weekly pay days, abolition of the automatic penalty clause and the two-year contract. By calling for no reduction in wages in the soft-coal fields it virtually announced that the miners are ready to negotiate for the least reduction they can get. Since they could hardly have been expected to "demand" a reduction, the original scale must be held to have been moderate indeed. Until Saturday afternoon, the last session of the convention, there was no expectation that the scale committee report would be debated or that there would be a serious attempt to amend it. But that was before the Farrington faction was defeated in its effort to overrule Lewis in his determination to keep Howat out.

The amendments to the demands, notably that changing the original demand for "eight hours underground" to that for a six-hour day five days a week, were a final triumph not so much for the radicals as for the anti-Lewis faction. The rebels, defeated by the narrow margin of 121 votes in the roll call on Friday, attacked the administration program because they just naturally would not stop fighting.

A majority of the union miners do not want a strike. They have provided that should no agreement be reached with the operators prior to April 1, they will take a referendum on whether they will go out or keep at work, and they have set up a policy committee in which they have placed wide powers. Since they are headed backward they have been careful not to burn any bridges. Given half a chance this policy committee can, and quite possibly will, steer clear of calling a strike in the bituminous fields. The hard-coal men are in a different mood.

As for the public, whose support the miners fain would have, the radical demand for the six-hour day and five-day week will overshadow the otherwise moderate claims of the union. So absurd is that demand, and so impossible of attainment, that Farrington's folly in forcing it on the convention will prove costly to them.

ON ONE GENERAL GROUND the miners and operators will meet in harmony of desire—that "inequitable differentials between districts, unfair working conditions and internal differences, wherever existing, be adjusted upon a fair and satisfactory basis." It is to remedy just such inequalities that the several operators' groups in the old Central Competitive Field have elected to go their own way this year, rather than follow the traditional interstate settlements. Both sides desire modification of local character in wage differentials and working conditions, but the desires are not parallel. It will be recalled that these questions were forced to the front by the union officers of the respective districts in the hearing before the Robinson commission and that that commission made no finding in respect to them. Instead it was recommended that these questions, because "technical and complex in their nature" and because "their determination may be expected to affect materially competitive relations as between operators and the relative earnings as between mine workers," should be referred to special commissions with proper staffs of technically trained men. This part of the award and recommendation of the President's Bituminous Coal Commission has been ignored. Five items were then listed as deserving of special consideration: the machine differential in Indiana, the differential between thick and thin veins in Pittsburgh, the 7c. machine differential in Illinois, the tonnage differentials in southern Illinois, and the discontinuance of the check-off. These and other questions will thus now be given the delayed consideration which is their due, but by separate and not interstate negotiations.

IN HIS LATEST BILL, providing for the setting up of a "National Coal Mining Board" to adjudicate labor disputes, Senator Kenyon states as axiomatic: "Coal is a public necessity, and in its production and distribution the public interest is predominant."

This is far from being a truism. Of bituminous coal one-third is taken by general industry and is no more essential than other raw materials as iron, steel, copper, cotton, wool and many other things. More gas for cities is made from oil than from coal. Lubricants are with coal equally essential to the operation of all forms of transportation.

What the Senator and others who make the broad claim that coal is charged with public interest have in mind is the coal that goes to the householder. About 15 per cent of the total output of bituminous and 60 per cent of anthracite falls in this category.

Repair-Shop Economics

WITHOUT a well-equipped repair shop mines cannot be kept in steady operation. Every mine must have some provision for the making of repairs, but the type of shop maintained and the character of repairs attempted vary widely from mine to mine. The facilities at small mines and sometimes at even larger ones are mere makeshifts rather than adequate plants. In rare cases, however, a machine shop is provided that is adequately equipped to take care of the needs of the mine which it serves. However, for the failure to make such provision there are sometimes more or less satisfactory reasons.

When any piece of equipment needs repairing, so many operations have to be performed on it that a number of machines are necessary, and, as the cost of these is high, the operator naturally questions whether it is well to attempt what can be accomplished satisfactory only at great expense. If provision is to be made for all the repairs needed at a mine producing 500 tons a day, for instance, a machine shop capable of making all the repairs at a 5,000-ton plant must be provided. For this reason the operator hesitates to build a completely equipped shop, and such repair shops are therefore uncommon.

Reliance is thus often placed on local repair shops which do the work for several mine establishments. Thus though some mines have real repair shops, others have a mere blacksmithy with more or less general repair equipment. In addition to these, wherever there are locomotives there are locomotive barns with some machine equipment and electric repair and car shops with facilities of varying completeness. It is of the general repair shop that I desire to speak.

When a company operates a number of mines scattered over a large territory, it is hardly feasible to maintain individual shops at each development because of the duplication of machines and repair parts. There are times, however, when this is done because the mines are too widely separated to permit of centralization. When the mines of any company are closely grouped the owner can take advantage of that fact and have a central shop in which repairs can be made in the most efficient manner, yet with minimum investment and overhead charges. In that event an elaborately equipped shop may be maintained, capable of doing all kinds of work, and a complete stock of repair parts may be kept on hand at all times.

The expense for labor in a shop at a small mine is as excessive as the cost of building and equipment. Where repairs are performed at the mine, a machine boss with one or more helpers is required. At times repair jobs are few, and the men employed must busy themselves looking for something to do. At other periods they are laboring overtime and on Sundays. This state of affairs is, of course, by no means conducive to efficiency. When several mines are grouped, however, the amount of repair work to be performed fluctuates but little throughout the year, for when one of the mines in the group has a number of repair jobs, another may have none.

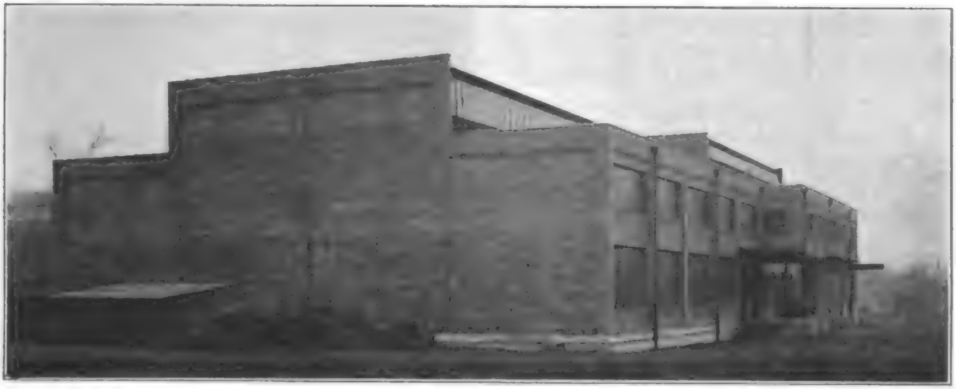
The number of skilled workers requisite to the operation of a central shop is much lower than that required for a number of individual shops even where the total of actual working hours is the same in each case. In the former instance the skilled men employed have an excellent opportunity to tutor a number of apprentices, performing themselves only those duties where skill is required. In this way all shop employees are kept busy, the apprentices acquire skill, and a much closer division of labor is made possible.

Here is should be remarked that many mines of small capacity have to maintain a machine shop of medium capacity because their location is so remote from other mines that a custom shop could serve but one mine and could not hope for any outside industrial business. In other cases, if other business did come to the custom shop, it would be performed under exceptional difficulties. By having a machine shop a long way from a mine, two or even more days are added to the time taken for every repair, and in extremely bad weather the delays may be longer.

In other places such repair shops have not been opened and rather than hunt around for a man to provide such a facility the operator erects his own. Where a new mine is near two or even several others already well provided, the operator may well argue that the other mines being able to take care of their own work, a custom shop might find it impossible to get enough work to justify its operation.

In this way coal mines are not like ordinary industrial plants, which usually are so located that they can depend on the services of a well-equipped custom shop where they can avail themselves of the organization and large equipment of such an establishment. Such a custom shop can and perhaps does add to repair work the advantages of manufacturing on a small scale. In that event it can often swing men from jobs of routine so as to make a light matter of a repair job which in the individual plant would take some days and much expensive overtime.

Operators have been a little slow to realize the importance of providing repair plants adequate to the maintenance and rebuilding of their equipment. The business of coal mining used to be regarded as akin to civil engineering and was quite largely recruited from that source, but today the mechanical engineering department is equally important, and hereafter mining men will be more largely chosen for their knowledge of machinery.



MAIN SHOP BUILDING: BEING SEEN LENGTHWISE THE SIZE OF THE STRUCTURE IS MORE OR LESS DISGUISED[*]

At Library the Pittsburgh Coal Co. Conducts a Central Machine Shop for Repair and Storage of Equipment

Fifty-five Mines Lying Within a Radius of Thirty Miles Send Their Repair Work to These Shops—Heavy Repairs Are Made at Mines by Skilled Mechanics from the Shops

By Alphonse F. Brosky[†]
Pittsburgh, Pa.

AN EXCELLENT example of a modern repair shop to meet the needs of a large coal company is exhibited by the Pittsburgh Coal Co.'s shops at Library, Pa. The village in which this shop is located is ten miles south of Pittsburgh, Pa. The company has fifty-five operating mines in the Pittsburgh district, with a possible daily production of 90,000 tons of coal. All of these mines lie within a radius of 30 miles of Pittsburgh. For years this company maintained two large shops, one at Scott Haven, Pa., on the Youghiogheny River, and the other, the Nixon shop, near Carnegie, Pa. Several years ago, however, it was decided to displace these by one large centrally located shop.

This resulted in the erection of the present installation at Library, which lies on a spur of the Montour R.R., on which six of the new mining plants are located. Many of the other mines of the Pittsburgh Coal Co. are on the Pittsburgh & Lake Erie R.R., with which the Montour R.R. connects. The Pittsburgh-Charleroi Ry. passes the shop and furnishes passenger and freight service between Pittsburgh, Washington and the Monongahela valley. Much material is transported by ship trucks, which take their loads at the mine and deliver them direct to the repair shop or vice versa.

The main building has a structural steel frame which rests on a heavy concrete foundation. The side walls are of rough-cut buff brick and have an unusually large number of windows, the sashes and frames of which are of steel. The building is fireproof, wood being used only in floor construction and then only where necessary for the comfort of the workmen. All doors are of steel construction and wherever possible fire doors are introduced, so that any fire breaking out may be readily isolated. The roof is of gypsum slab covered with tarred felt and the floors are of concrete. Kreolite wood blocks are used for paving the assembly aisle of the machine shop floor, with maple flooring under and upon the balconies where bench and machine hands are employed. The warehouse floor is of wood block on the first floor and concrete on the second. Steam heat is

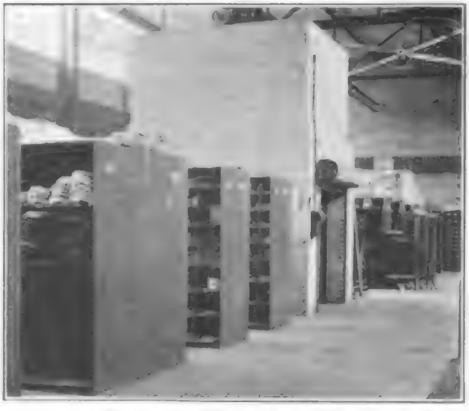


FIG. 1. SECOND FLOOR OF STOCK ROOM

On this well-lighted floor all the lighter repair parts and miscellaneous materials are kept in steel bins. The stock is well arranged and indexed. The elevator in the center leads to the stock room below, where heavy material is stored. Shelving and individual compartments are designated by number, corresponding to the record on the ledger cards.

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[*] On the left can be seen one of the workmen's dwellings and on the right is the substation. The main shop building is constructed so that an addition may be built readily on either end.

[†] Bituminous Editor, *Coal Age*.

supplied through 1½-in. radiator pipes placed two deep along the walls, the steam for the purpose being generated by two 125-hp. Pennsylvania boilers. Little artificial lighting is necessary because of the ample window area.

The stock room is located in the north end of the shop, the lower floor being used for the storage of heavy equipment and the upper floors for lighter material. Between the stock room and the shop on the ground floor is placed a large and cheerful office with walls and ceiling painted white so as to reflect light. A runway connects the second floor of the stock room with the second floor of the repair shop; the office is of one-story construction. The repair shop contains two departments, the machine shop on the ground floor and the electrical shop on the balconies, each operated under a separate foreman. To the east of this part of the building stands a separate two-story structure, the first floor serving for the storage of inflammable material and the second floor being used for the impregnating of armatures and field coils. The impregnating room is connected with the winding department by an inclosed bridge.

A large fireproof garage has been built to the north of the main shop. This houses the trucks and passenger cars which the shop uses in connection with its work. The blacksmith shop and the substation are located to the southward. Several hundred yards away in the same direction stands the tipple of Montour No. 10 mine, the newest and largest mine operated by the company. A number of five-room dwellings have been built on a terrace to the east of the shops. These are occupied by the shop employees.

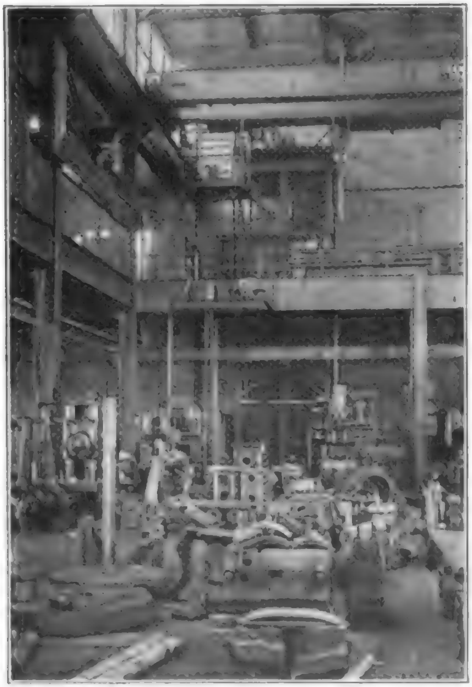

FIG. 2. MACHINE SHOP FLOOR

The 20,000-lb. Champion overhead crane shown in the background permits heavy equipment to be placed anywhere on the machine-shop floor or to be lifted to the northern electrical-repair balcony above. Smaller equipment is moved on two-wheel trucks to the elevator back of the crane. The gears shown in the center of the illustration are solid; split gears are not used.

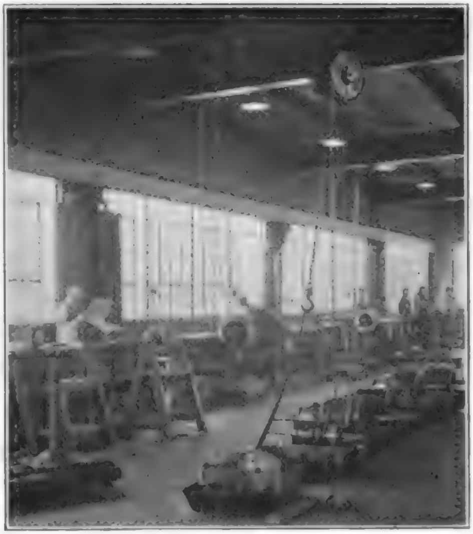

FIG. 3. ARMATURE-WINDING FLOOR AT NOON HOUR

The floor of the winding room is of wood laid on concrete. Ample floor space is provided.

Repair jobs from the company's mines are sent to these shops. No attempt is made to manufacture a stock of repair parts or to build equipment, the shops confining their attention to repair work. This includes repairs to mine-locomotive wheels and axles, gears, steam- and electrically-driven pumps, engines, motors, generators, air compressors, hoists, piping, etc., and everything mechanical and electrical about a mine. Repairs to cutting machines are performed at the mines by the machine bosses, all parts being carried in the storerooms at Library. About eighteen men are employed in the machine shop. By referring to the accompanying table an idea may be gained of the number and kind of machines used in these shops. All machines are driven by individual motors, no belts or counter shafting being used. The tool cabinets, benches and shelving are alike of steel.

A wide balcony skirts the north, east and west sides of the repair shop. On it is located the electrical repair department. Here motors and generators, both for alternating and direct current, ranging in capacity from ¼ hp. to 500 kw., are repaired. The west balcony is the assembly section, where motors and generators are torn down and rebuilt. A number of winding machines, several lathes and a few drill presses are included in the equipment. A miners' electric lamp department is placed at the south end of the west balcony. Here two men are engaged in the repair and maintenance of Edison batteries and lamps.

Armature repairs are made on the east balcony. The dipping room contains two large steam-heated ovens and two air-controlled dipping tanks containing black plastic insulating varnish. Directly below this room is

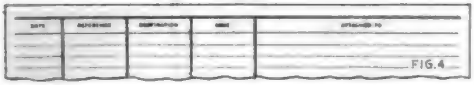

FIG. 4

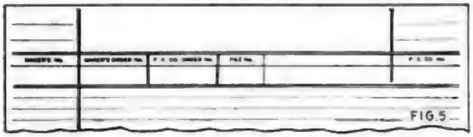

FIG. 5

FIGS. 4 AND 5. FORMS USED AT SHOPS

Fig. 4 is a record of material at the mining plant. Under the word "Reference" is placed the invoice number. In the last column is shown what the motor—if it is a motor that is being tabulated—is attached to. Fig. 5 is the back of the card shown in Fig. 4. In the blank space is placed a description of the apparatus and its capacity.

located a large tank for the storage of this material. It has a capacity of 20 or 25 bbl. From this tank, varnish is pneumatically raised or lowered to or from the dipping tanks. Here also are stored all other paints, oils, greases and waste.

Eighteen men are employed in the armature room. Among these are a number of skilled winders and helpers. One man turns and undercuts commutators, and another performs the necessary machining of shafts. Three men are engaged on starting boxes, field coils and general repairs. One man tears down motors and attends to the dipping-room operations, and another boxes and unboxes armatures.

In the soldering of the terminals of commutator bars a departure is made from established practice. On large armatures electric irons have not proved successful. Fire-heated irons are slow and their temperature is continuously changing. A natural gas-oxygen flame is being used with favorable results. In using the ordinary soldering iron the worker must stand on the side of the armature and stoop over close to the work. In using the flame he may stand at the end of the armature shaft away from the work and apply the solder with ease.

The flame is hot enough to melt iron or steel, but it is manipulated with such rapidity as to have no injurious effect on the copper. The solder drops into place, and the work progresses almost as rapidly as the worker can transfer his flame and solder from one bar to the next. Because of the extremely small flame, which does not spread, there is no danger of charring the insulation.

A large platform has been erected on the east side of the building, along which runs a railroad siding. On the west, or front, side a concrete platform has been built, which serves both as a receiving and a shipping floor for material hauled by motor truck. It also serves as an entrance approach to the entire building.

In the repair department a 10-ton Champion crane extends across the floor of the machine shop and also across the north balcony of the armature section. Two-ton Yale & Towne hand cranes suspended from carriages running on beams serve the area above and below the balconies, so that any machine part may be lifted and deposited at any desired point. Small material is raised or lowered in the elevators, one of which is provided at each end of the building.

The boiler room, blacksmith shop and welding room are housed under the same roof. The blacksmith shop is equipped with forges, a Bradley power-driven bit-shaper and a steam hammer. The welding room is furnished with one General Electric 2-unit electric welder, six acetylene welders and one Wilson portable 3-unit electric welder. For heavy machinery that cannot be moved from the mines, however, a portable welder is employed, this apparatus being taken to the work by motor truck, the welding being done in place. This brings us to the subject of road service.

The company has in its employ a number of "roadmen" skilled in their respective trades. These men travel from mine to mine, making and supervising such repairs as necessarily must be made at the mines.

Complete records and files of the equipment at all mines are kept in the office of equipment at the shop. Similar records are maintained in the Pittsburgh office, the data at the one place acting as a check upon the other. When a new piece of equipment is received a company name and number plate is securely fastened to it. In this way a double means of identification is provided. Should either the manufacturer's plate or the company plate be lost one identification mark still remains on the machine until the missing plate can be replaced. An entry is made in the files according to the notation of Figs. 4 and 5, which show the two sides of a single white card.

In Fig. 4, under the heading "Reference," is placed the invoice number for the particular piece of equipment in mind. The headings "Destination" and "Mine" are practically synonymous. If a motor were shipped to Montour No. 10, for instance, record would be made of that fact, and the card, with the other headings properly filled out, would be placed in the file of this mine. In case of a transfer of this motor to some other operation, the name of the mine to which it was sent would be placed in the space below the name of the one from which it came—namely, Montour No. 10. The white record card also would be transferred to the file of the transferee.

Should the motor be destroyed by fire or through some other accident, a record would be made of that fact opposite the name of the mine where it was destroyed, under the heading "Destination." The notation used in this space would be the term "Scrapped." The date also would be entered. As much of the equipment con-

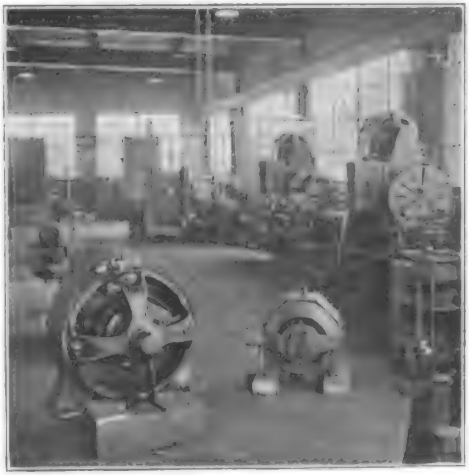

FIG. 6. WHERE MOTORS ARE TORN DOWN AND ASSEMBLED

The lamp-battery repair room is shown in the rear, separated by an iron wire screen.

LIST OF LARGER MACHINE-SHOP EQUIPMENT IN LIBRARY SHOPS

Type of Machine	Make	Number Installed	Size
Bolt Cutter	Standard	1	2 in.
Bolt Cutter	National	1	2 in.
Centering Machine	Prentiss	1	5 in.
Drill Press	Hoefer	3	26 in.
Drill Press	Niles-Bement-Pond	1	72 in.
Grinder	Blount	1	
Grinder	Norton	1	72 in.
Hor. Mill	Bement	1	30 in.
Lathe Vert	Bullard	1	42 in.
Engine Lathe	Davis	1	24 in.
Engine Lathe	Niles-Bement-Pond	1	42 in.
Engine Lathe	Hendey	1	18 in.
Engine Lathe	Lodge & Shipley	1	26 in.
Engine Lathe	Lodge & Shipley	1	24 in.
Engine Lathe	Porter	3	22 in.
Engine Lathe	Springfield	1	24 in.
Milling Machine		1	No. 2
Milling Machine		1	No. 3
Planer	American	1	36 in.
Wheel Press	Niles-Bement-Pond	1	300 ton
Key Seater	Baker	1	
Pipe Mach	Bignall & Keeler	1	10 in.
ARMATURE FLOOR EQUIPMENT			
Banding Lathe	Greaves-Khuman	1	
Drill Press	Hoefer	1	26 in.
Grinder	Blount	1	
Lathe	Lodge & Shipley	1	24 in.
Lathe	Niles	1	24 in.
Shaft Press	Niles-Bement-Pond	1	150 tons

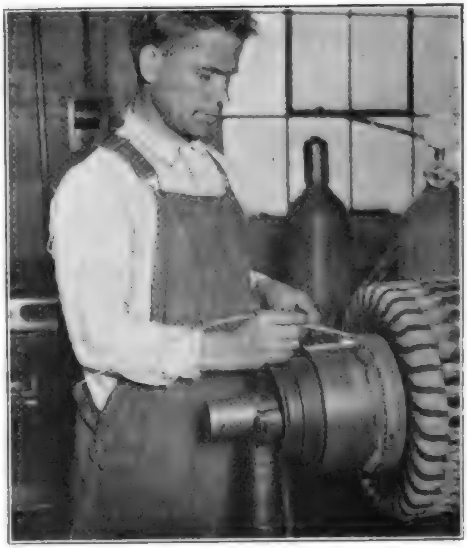

FIG. 7. SOLDERING COMMUTATOR BARS WITH NATURAL GAS-OXYGEN FLAME

Note the ease with which the man works. He does not have to exert himself or waste time keeping his irons clean. The flame does not soil the copper and so a good bond is obtained. This is not only a quicker way of soldering but a cooler way than the one it displaces.

sists of motors, the heading "Attached To" has been added. In this space is entered the type of machine driven by the motor.

The filling out of the reverse side of the card, shown in Fig. 5, is simple. No fixed scheme can be adhered to in making this record, as all kinds of equipment are handled. The blank space at the top of the card may be used for entering the title or character of the apparatus and the capacity. A cross-file system is maintained, white cards being kept in the mine file and similar blue cards in the equipment file. Going to the latter, one may readily discover the number and kind of pieces of each type of equipment.

Approximately 1,000 armatures of various sizes are kept in stock at the Library shops and at the fifty-five mines of the company. These belong neither to the shop nor to the mines, and careful record is kept of the whereabouts and size of each. In case of emergency if the armature required is not on hand at the mine, the shops are requisitioned by telephone. The files kept, at that point, furnish the necessary information as to the whereabouts of a spare of the needed type and capacity.

Listed in the equipment of the 55 mines, and cared for in the Library shops, are 15,000 Edison battery lamps, 750 mining machines, 218 trolley locomotives, of tonnages ranging from 6 to 25 tons (the majority of them weigh 13 tons), 18 storage-battery locomotives, 2,400 alternating- and direct-current motors varying from ¼ to 300 hp. (the total horsepower of these machines approximating 60,000), 98 steam engines with a total horsepower of 15,500. There are also 36 steam-driven generators totaling 8,000 kw. and 54 motor-generator sets ranging in capacity from 150 to 300 kw.

Several employees in the Library shops have been continuously in the company's employ for twenty years or more. The majority of these men learned their trades in the company's shops as boys.

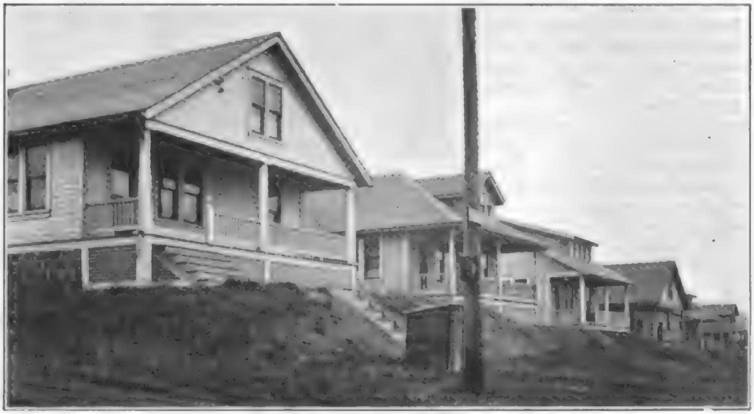

FIG. 8

Shopmen's Dwellings

These houses are modern, having hot and cold running water, furnaces, electric lighting, etc. Each house has five rooms and a finished attic. All the houses being painted differently, the group is known as the "Rainbow Row."

Intelligence More Important Than Knowledge in Successfully Managing Anthracite Mines*

Brainy Man Soon Acquires Information—Assignment to Special Work Reveals Fitness for Supervisory Positions—Shifting Value of Dollar Makes Physical Statistics of More Lasting Worth Than Financial

BY W. H. WILLIAMS†

THE problems which confront the management of the mining industry or any other industry are largely the same. If any problem can be correctly and clearly stated, all intelligent men can agree on the solution. The difficulty we find is in stating the problem.

I am going to approach the subject from the standpoint of one operating many mines and having a large organization, and at the beginning I will just say a few words in regard to the anthracite industry. There are not many differences between it and other branches of mining. If there is any, it is in the number of veins in which we operate. We operate from eight to twelve veins. All of the mining operations have been going on in the anthracite fields of Pennsylvania since the early twenties. In the early mining the coal was recovered from the thicker veins, and the mining did not proceed along the lines of today. The pillars which were left in place were not regular, the mining maps were not preserved, and now that we are coming into the thinner veins we do not know accurately the condition of the coal in the veins in which mining has taken place. In the Northern field we have gotten into what we call the second mine, and the failures of the past are confronting us today. Had the mining gone forward in that way—had it gone forward as we proceed today—the pillars would have been columnized and our problems would have been much simplified.

CUTTING MACHINES SELDOM USED IN ANTHRACITE

There is one difference between the anthracite and the bituminous in that we have very little opportunity for the use of coal cutting machines. I believe about 60 per cent of the bituminous coal of the country is produced with the coal cutter. Only in the Northern field does the coal lie sufficiently level to permit of their use, and until recent years the coal cutters were not sufficiently strong to stand up against the anthracite. In the Southern field the coal pitches so much that it is impossible to use the machine. We have one other difference in the anthracite as compared with the bituminous, in that every miner, or practically every miner, employs a laborer, so that we have two men doing what one man would do in a bituminous mine.

In the anthracite field we pump approximately sixteen tons of water for every ton of coal that is produced. It is estimated that we pump water, lift the rock and pump in there the equivalent of about thirty-six tons for each ton of coal. This coal, after it comes to the surface, must be cleaned and sized, and for that we have what is termed a breaker. These breakers are about 160 ft. in height and 140 x 160 ft. base. A modern breaker will cost anywhere from $1,500,000 to $2,000,000. It is estimated that to open up a mine in the Scofield district which would produce approximately one million tons a year of output and to furnish the houses for the employees necessary to produce that tonnage would cost approximately $8,500,000. You will readily see that the investment necessary to produce the coal in the anthracite field is quite a considerable item.

Probably the first question which confronts the management is that of the personnel. I feel that too frequently we do not distinguish between knowledge and intelligence. There are many men who have the knowledge, but when it comes to the management we must have the intelligence as well as the knowledge. Of the two, intelligence is the more important factor. A man with intelligence will acquire the knowledge.

MEN FOR SUPERVISORY WORK CAREFULLY CHOSEN

On these men is dependent the selection of the men for the supervisory staff. In order to overcome the many mistakes which we have made in the past in the selection of men for these positions, we are undertaking now to select the men who in our judgment are likely to make good. We take eight miners and assign them to special work—men who we feel will develop into section foremen. We take four section foremen who we feel are capable of promotion to senior assistant foremen. Then we take four senior assistant foremen whom we believe to be capable of promotion to the position of foremen, and two foremen who we believe will be capable of promotion to the position of superintendent. These men are assigned to special work, first on one kind of work and then on another. They make reports of what they see, and, based on these reports, we determine whether or not we were wise in the selection of them for this kind of work. If they make good, they are likely to be selected for the first available vacancy.

We have often heard that the men in the management class devote too much time to detail. I feel we should make the distinction, however, as between the men devoting their time to detail and the men having a thorough knowledge of detail. It is absolutely essential that they know all branches of the work and of the day-to-day performance, in order that they may intelligently handle the problems which confront them.

Too frequently men are fearful that the men under them may develop so far as to jeopardize their positions. Our feeling is that the bigger you make the men under you the bigger you make yourself. The first obligation of any man is to develop these men under him, and I believe the real test of your efficiency as manager of any institution is the character of men you have selected for your supervisory staff.

At times the suggestion has been made that we should make some change in this staff because men are not making good, and in answer to this suggestion we have asked these two questions invariably: What have you told the man to do that he is failing to do? What have you told the man not to do that he continues to do? If you cannot answer either of those questions, then the failure of that man to make good rests with his superior officer rather than with himself. It is to be presumed that you have been put in the more responsible position because you have a greater knowledge of the industry in which you are employed. If you have that knowledge, you have also the increased responsibility of seeing that the men under you are given an equal opportunity to acquire full knowledge of the work to which they have been assigned.

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*From an address before the American Mining Congress, Chicago, Oct. 7-22, 1921.

†Senior vice-president, Hudson Coal Co.

Next in importance is the relation with the men. The first item which has a direct bearing on the relations is that of the miners' houses. I feel we have often made the mistake of painting all of the miners' houses one color, giving them the appearance of an institution. Some three or four years ago we tried out the policy of painting these houses in different colors and with a different body trim. That did not require any change in the construction of the houses and no additional expense. The difference in the appearance has been remarkable and much appreciated by the men.

CHANGE HOUSE HAS MODERN ARRANGEMENTS

Next in its effect on the men has been the character of change house or wash house where they change their clothes. We formerly had the old-style locker such as you see in the country clubs, but when the wet clothes were put in there at night and when the men come back in the morning the clothes were found to be damp. We therefore borrowed a plan which was developed in either Germany or Belgium. The building is some twenty feet in height with rafters from one end to the other and with strips of them near the floor. There is a chain going from the lower rafter to the upper, attached to which is a bucket and a clothes hanger. The man puts his clothes on the clothes hanger, his shoes and towel, soap and other things in the bucket, and pulls the chain until it goes up to the upper rafter, and locks the chain so that nobody can get at his belongings. It is found that by keeping these rooms warm, in the morning the clothes are nice and dry, and we have gotten away from the musty smell which usually is found around a club locker.

Next in this report is the treatment of the men who are injured. We make it a practice that where a man is killed or seriously wounded, the superintendent must personally notify the family and extend such relief as is necessary at the time to tide them over their emergency. He is required to visit men in the hospital and otherwise see that they are well taken care of.

We then have the question of discipline. We have adopted a standard. We got together the sixteen superintendents, gave them the causes for which men are disciplined, and asked them what in their judgment was a fair discipline for each of these offenses. After they had reached their conclusions we said, "That will be your standard. You must make the discipline more or less severe, but if you do you must state in writing your reasons for so doing." That has gotten away from the snap judgment which prevailed in the past and has materially improved our relations with our men. We have provided baseball grounds for recreation and have established a mining institute. Originally we had intended that the latter should be for the benefit of the officers only, but when the question was asked whether there would be any objection to inviting any of the men, we answered that we would be very glad to have that done. Much to our surprise, more than eight hundred men turned out at the first mining institute at one of the mines, as the result of which we changed the character of the meeting and the men are given an active participation in our monthly meetings.

We have also appointed miners' instructors. If the Poles predominate at a mine, we select a Pole. If the Italians predominate, we select an Italian, and so on. It has been found that by a slight change in the angle of the hole which is drilled and by proper instructions as to the charging of the hole, the amount of work which the men are required to do and the amount of powder they are required to use to blow down a given quantity of coal has been materially reduced, thereby increasing the earnings of the men anywhere from $1.25 up per day after instruction. This is quite an important factor. It is the ability of the men to earn a reasonable wage that determines whether or not they are satisfied with their work; and with the improved performance which has come as the result of the instruction, we have gotten a much greater degree of satisfaction among the rank and file.

There also is the question of safety. Mining is a hazardous employment. Each accident is investigated by a safety engineer, and in addition to that we undertake to analyze the cause of accidents and see to what extent it is possible to prevent future accidents. One of the helpful things is an accident chart locating on a map each accident which is reported. This soon brings to your attention certain places in the mines where accidents are of frequent occurrence, and a study of the accidents in that section enables you to apply the proper remedy. We have also taken the position that every man in our employ has a just grievance if he feels he has one until such time as the facts are clearly explained to him. The success of the institution is dependent upon the imagination of the officers—their ability to look into the future.

DEVELOPMENT PLANNED FIVE YEARS AHEAD

We prepare a five-year development program showing the coal from each section of the mine and from each section of each vein which we expect to mine during each of the coming five years. Based on that production estimate, we arrange our development program with reference to the driving of gangways, counters, airways, pumping, transportation, etc., and from these programs we make up our annual budget. The work of the different classes is assembled on the sheets, the estimated cost is shown, the effect on the output, the effect on our net earnings—whether it will increase our earnings or reduce our expenses—and the items of work selected for the coming year are dependent on the relative return which will come from the investment that is to be made.

In connection with these programs we have made topographical maps of each bed. We are finding these of considerable advantage in working out our transportation system so as to reduce the grades of our tracks, and thereby increase the work which can be performed by either the mules or the electric locomotives.

The statements are prepared showing the cubic yards of gangway work, airway work, etc., which is to be done during the year, and at the end of each month a statement is made showing what has been accomplished and whether we are up to our schedule or not. In the anthracite fields sufficient attention has not in the past been given to the question of transportation, and yet there is no one item which so materially affects the output of a mine.

First there is the question of equitable car supply. We have numerous complaints from the men of inability to receive all the cars they desire. Analysis of the subject indicated that if there was a breakdown, the tendency was to throw the cars into the chamber nearest the shaft, with the result that the men in the outlying districts did not get a fair car supply. We now have an arrangement under which the men place orders for cars as they go to work in the morning, somewhat after the fashion that shippers on a railroad place their orders for cars, and a statement is made at the end of each day and at the end of each month showing the extent to which we have furnished all the cars that were requested by each of the men. We have found in some places where we were not furnishing a full supply, that the transportation facilities were inadequate to permit of supplying all the cars needed for the number of men located in that section. Pending the time when we could make the development we have reduced the number of men in that section, thereby enabling us to give a full car supply to those who remained at work, and without in the slightest degree reducing the quantity of coal that came from the section.

OUTPUT INCREASED WITHOUT MORE CARS

In handling car distribution we have found it advantageous to install in each section of the mine telephones which are connected up with a car distributor located in the superintendent's office. With a view to testing the efficiency of the men in handling cars we numbered all of the cars in a mine and kept a record of the trips which were made by each car. Much to our surprise we found that there were a number of the cars that made only one round trip in something like four days, nothwithstanding the fact that we averaged about one trip per car per day for the entire mine. But this pointed out the places in the mine where delays were occurring in the handling of the cars, and this study has enabled us to increase our output without increasing our number of cars.

Each superintendent is given a statistician. We feel, however, that in the past we have been what you might call dollar mad in preparing statistics. I don't mean that we were looking for the dollar, but in preparing our statistics we have used financial statistics rather than physical statistics in analyzing the operations. Financial statistics do nothing more than to indicate whether you are conducting your business at a profit or a loss. They do not measure the efficiency of your men. Your dollar is as changeable in its value as any other commodity, and with the changes in the rates of pay and the changes in the prices of material, any statistics which are based on dollars are not on a comparative basis. We, therefore, use the physical statistics. A man hour is the same today as it was yesterday, last week, or a year ago; it is the same over a five- or ten-year period. This is true as to the ton, as to the car, as to the locomotive, as to the mule, etc., and when your statistics are prepared on that basis you have comparative figures over a five- or ten-year period which clearly indicate the way you are drifting.

Among other statistics we have those relating to the refuse in mine cars and the topping of mine cars. A miner is required to top his car anywhere from 5 to 8 in. The quantity of refuse is dependent on the character of the vein. For the purpose of testing these out, we have what is known as a jury house, where three or four cars each day are supposed to be tested. At times we have found that the man in charge apparently was influenced by other than the best interests of the company, and so we have put on special testers, taking twenty consecutive cars from each section of each vein and testing them with these special testers. We have found in numerous cases that the average amount of refuse shown by these special testers was in excess of the average of the cars tested in the jury house, notwithstanding the fact that only the worst cars were supposed to go to the jury house, which clearly showed that our sectional foremen were not reporting the worst offenders and arranging for their cars to go to the jury house.

The next physical test is that of the sizing of the coal, which is an important factor in anthracite mining. Some 60 to 65 per cent of the coal is what is termed domestic sizes, that is used in the home. The balance consists of coal used exclusively for steaming purposes, the market price of which is dependent upon the price of bituminous coal, and which is very, very much below the average cost of mining, usually running from $3 to $4 less than the average cost of mining a ton of coal.

One of our best tests is what we call the yield per 100 cu. ft. We have the cubical content capacity of the car, plus the topping, multiply the number of cars handled by that cubical content, and divide it into the output per day, which enables us to find out what the yield is per 100 cu.ft. That is affected by the topping and is affected by the amount of refuse, and if the yield is going off it indicates that our supervisory staff are not giving sufficient attention to the refuse and topping.

ANALYSIS KEEPS UP QUALITY AND PREVENTS WASTE

We then analyze the coal prepared for market as to the percentage of refuse and as to sizes, to see that it meets the market demand and that the men are not undertaking to overcome their inefficiency by preparing an inferior coal for market. We analyze the refuse on the dump to see that good coal is not being wasted. We also analyze the coal going to the boiler room, with a view to seeing that only the poor grades of coal are put in the boiler room and the better coal sent to market.

We also have statistics showing the tons of coal per keg of powder produced. These are useful not only from the standpoint of indicating whether the men are being properly taught how to produce the coal but when cases come up where the men claim that the coal is too hard in any one section, a comparison of the powder figures will give an idea whether their contention is correct.

We also analyze the quantity of rock with a view to seeing its relation to the quantity of coal produced and its effect on our cost. Our man-hour statistics are divided as between producers and non-producers, and we ascertain the quantity of coal that is produced per man-hour or per man-day. The earnings of the men are analyzed individually and by sections. This work is done by the auditing department. Where the earnings of the men in any section are indicated as below what we regard as a reasonable figure, they are run in red and forwarded to the colliery's superintendent, who is required to make a personal examination of the situation in that section to ascertain why the men are not making fair earnings. This has helped us to locate some of the places where a car supply was insufficient and where it was impossible with our facilities to get sufficient cars back to the men.

Horizontal Shaking Screen Which Keeps Coal Moving In One Direction Without Jerking Tipple Structure

By Revolving Weights and Spring Supports a Compound Motion Is Obtained Whereby the Coal Is Caused to Travel Forward Continuously—By Duplicating and Opposing the Parts Useless Vibration Is Prevented

By Alphonse F. Brosky*
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SEVERAL stages have been passed through in the development of screening facilities. In the first the coal was moved over the screens by gravity. This method was only partly successful. Discovering that proper separation could not be obtained upon grizzlies, inclined shaker screens were adopted, and the coal sized over them was at once recognized by the trade as being superior to that made over gravity screens. Manufacturers of mine equipment desiring further simplification next brought out a shaker screen that was horizontal. This device lent itself readily to the hand picking of sizes larger than nut and slack.

Both the inclined and the earlier horizontal shakers were given a reciprocating motion, the reaction from which had to be absorbed or resisted by the tipple frame or by special supports. These proved at once troublesome and expensive. Many attemps have been made to balance these screens, but the results have not been entirely gratifying.

The C. L. Miller Co., of Scottdale, Pa., manufacturer of mine equipment, has perfected a horizontal shaking screen, the invention of C. L. Miller, the reciprocation of which is secured through the revolution of unbalanced weights. The screen moves back and forth without anchorage or connection to any stationary object other than the foundations that support its weight. This statement may seem ridiculous on first thought, but the screen so oscillates nevertheless and in such an easy and quiet manner that the shopmen who built and installed the first one promptly dubbed it the "shimmy shaker."

Drive Head Moves Coal Steadily Forward

The screen body is of the ordinary plate type, built to suit local conditions. To this is secured a drive head that shakes the screen body with a peculiar motion, effecting a movement of the coal in one direction only over the horizontal decks. Inasmuch as the idea embodied in this device is an entirely new one, it might be well to go into the mechanics of the drive head which produces this motion.

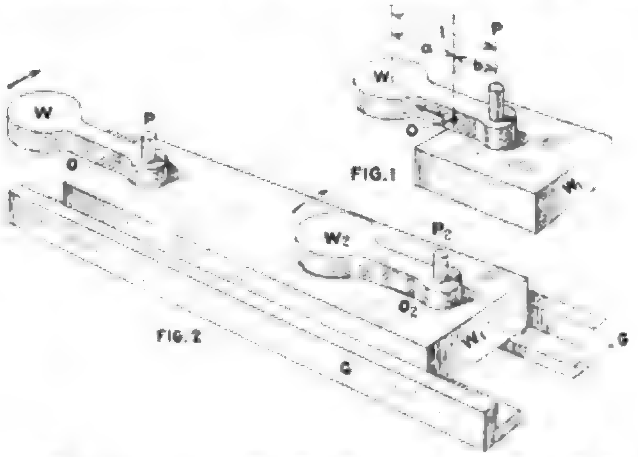
In Fig. 1, W is a weight pivoted on the pin, P, set in the block, W_1, which is assumed to be fixed. If the weight, W, is caused to rotate about P at a uniform velocity, it will exert on it a certain radial pull, depending upon the mass of W and the square of its speed of rotation.

Now suppose that the block, W_1, is free to move in any direction. The weight, W, is rotated at a certain velocity, and the centrifugal force will pull the block, W_1, out of its original position of rest. It accordingly will rotate about the vertical gravity axis or center of gravity of W and W_1 combined. The distance of this new center, O, from the pivot, P, is b, and from the center of gravity of W its distance is a, the ratio of the two being such that $Wa = W_1 b$, where W and W_1 are the masses of the weight and of the block respectively. As will be seen, the distance b will remain constant regardless of the velocity of revolution of the weight, W. At all speeds the point of the pivot, P, will describe a circle about point, O, with b as a radius.

For screening, the circular motion of block W_1 is not desired. What is desired is an unbalanced speed of reciprocation on a fixed line. Accordingly, as shown in Fig. 2, W_1 is placed between guides so that it can move only in a straight line. The block is shown elongated for further consideration and is supported in the fixed guides, G, so that it can move only in a line parallel to the guides. Now if the weight, W, is revolved at a uniform velocity, it will react on block W_1, attempting to move it in a circle with O as a center, as before. But since the guides, G, prevent all but straight-line movement, the block will move backward and forward between the guides with a simple harmonic motion.

Simple harmonic motion is that closely approximated by any reciprocating object when controlled by a connecting rod from a crank or eccentric on a revolving shaft. It is practically the motion of the standard inclined shaker screen. If an inclined oscillating screen were made horizontal, the coal on it would simply shake back and forth with each stroke and would not travel progressively to the end of the shaker.

It therefore follows that a motion other than simple harmonic, produced by a single revolving weight, must



FIGS. 1 AND 2. DIAGRAMS SHOWING PRINCIPLES ON WHICH MOTION OF SHAKING SCREEN IS BASED

In Fig. 1 the weight W revolving about the pivot P, which is attached to the free weight W_1, has a composite motion as if revolving about the point O, which is located so that the moment of W is equal to the moment of W_1. In Fig. 2 are shown two independent weights, W and W_2, revolving about pivots, P and P_2, which are attached to W_1, that weight being controlled by the guides, G, so that it can move only along a straight line.

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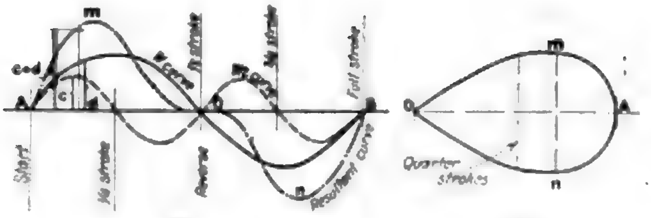
*Bituminous Editor, *Coal Age*.



FIGS. 3 AND 4. SPEED AND ACCELERATION CURVES FOR COMBINATION OF THE TWO HARMONIC MOTIONS

The resultant speed curve, Fig. 3, for a combination of two harmonic motions, one twice as rapid as the other, is an extremely rapid movement, as at *m*, and a comparatively long period of almost entire rest, followed by another extremely rapid movement, as at *n*. Fig. 4 is an acceleration diagram of the same motion, the forward accelerations being plotted above the stroke line and the return movement below it.

be obtained if the principle of an unbalanced force is to be applied successfully. Suppose then that another weight, W_2, be mounted and caused to revolve on the block, W_1. Its motion and consequent centrifugal force would act upon W_1 in the same manner as did that of *W*. The resultant travel of the block W_1 between the guides, *G*, would then be a combination of the travels induced by the force reactions of the two revolving weights.

Now let it be further assumed that the revolving weights *W* and W_2 are connected in such a way that each has a fixed movement in relation to that of the other. For example, suppose that W_2 revolves twice as fast as *W*. Now if there is no slippage, at every revolution of *W* the two weights will come into exactly the same position as indicated in Fig. 2. The weight, *W*, will tend to impart simple harmonic motion to W_1, but while *W* is acting through one cycle W_2 will tend to impart to W_1 a harmonic motion through two cycles.

Referring to Fig. 3 the full-line sine curve there shown gives the transverse movement of the block W_1 under the action of the weight *W*. The dotted curve shows the movement of the block as the result of the movement of W_2, while the resultant of these movements is shown by the dot and dash curve. This last is a combination of the first two, their ordinates being algebraically added.

It will be noted that the highest point of the resultant curve, which represents the greatest velocity of travel of the block, W_1, occurs before the quarter-stroke point and that on the reverse movement it follows the three-quarter stroke point. The maximum velocities of travel for both the other curves occur on the quarter and three-quarter points respectively. The resultant force imparts to the block, W_1, a motion which, when applied to a horizontal screen, will cause the coal upon it to travel continuously in one direction by a series of glides in harmony with the movement of the screen.

From the velocity curves may be derived an acceleration curve, shown in Fig. 4. From this it is easily understood how the motion of a horizontal screen causes the coal to travel in one direction. The lettering in Fig. 4 corresponds to that of Fig. 3 as regards the maximum and minimum points. The curve described in the return stroke has been transposed so as to begin and end the cycle at the point *O*. In this cycle curve the fact should be noted that the point of maximum acceleration does not coincide with the quarter-stroke point.

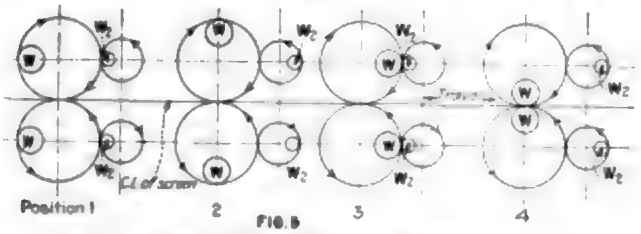


FIG. 5. HOW SIDE STRESSES ARE BALANCED

It will be noted that at all points the weights are pulling squarely apart or pushing squarely against each other except as they act in the direction of the screen travel, thus leaving no forces to be resisted by the rigidity of the mechanism.

Starting at *O* the screen accelerates gradually to the value *m*, the actual speed being so regulated that the coal on the screen is carried forward without slippage.

At *m* the coal has reached its greatest velocity and each particle has stored within itself a certain amount of kinetic energy. From *m* to *A* the screen continues to travel in the same direction but its movement is retarded rapidly. This retardation is so swift that the kinetic energy of the coal overcomes its friction on the screen decks, and consequently it glides forward. At *A* the direction of travel of the screen is reversed and its movement rapidly accelerated to its maximum reverse speed at *n*. Meanwhile the kinetic energy of the coal continues to overcome friction. The coal consequently continues its forward movement, gradually slowing down to zero at the point *O*, which is the end of the return stroke and the completion of the cycle.

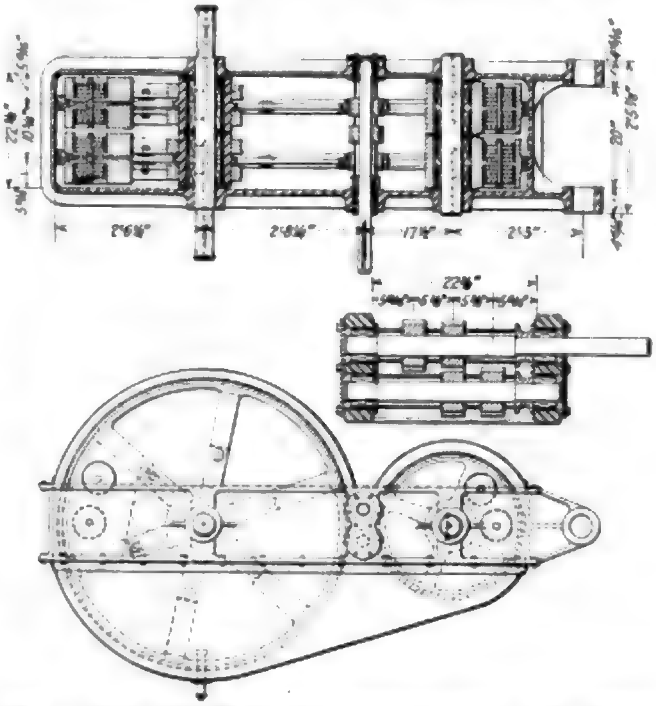


FIG. 6. PLAN AND ELEVATION OF SHAKING MECHANISM

Gears driven by a belt from an electric motor cause two pairs of eccentrically loaded gears to revolve, one pair making twice as many revolutions as the other. This combination turns a simple rotating movement into a jerking action, which shakes the screen but not the building in which it is erected.

The weights on the drive head are adjustable and may be regulated so as to equalize the kinetic energy of the coal stored up from *O* to *m* and the frictional retardation forces from *m* through *A*, and thence through *n* to *O*, both these latter portions of the cycle being on the retard, or return, stroke. As a result there is no backward travel of the material on the screen to confuse the pickers as they remove the refuse.

In the discussion of Fig. 2 it was stated that the guides, *G*, prevented the block, W_1, from receiving side motion. Now the force necessary to move the block, W_1, along the guides must equal the reaction on the guides. The revolving weights, W and W_2, exert forces upon the block, W_1, equal in all directions, when considered individually. The block in turn exerts a force equal in all directions. If these side forces were actually absorbed by means of guides as indicated, there would be quite a load on a full-sized installation. In practice the drive head counteracts these forces within itself. This is accomplished by using a double set of revolving weights, moving in opposite directions with equal linear velocities.

Fig. 5 gives a graphic analysis of this detail. In addition to the control weights, W, two smaller compensating weights, W_2, revolving at a 2 to 1 ratio, relative to the large ones, are shown. The larger weights are called control weights because they exert the controlling forces on the screen body, making it oscillate with each revolution. The smaller are termed compensating weights because they serve only to alter or modify the action of the larger ones.

Experiments have disclosed the proper ratio between these weights to give the best results on the screen. Fig. 5 shows the control weights in four different stages or positions during one complete cycle or revolution. The weights revolve in opposite directions, as shown by the arrows, and the compensating weights are shown in their respective positions at each quarter period.

In Position 1 all the weights are pulling to the left and there is no force acting across the center line of the screen. In Position 2 the control weights, W, are pulling across the center line but are counteracting each other, and the screen is moving under the influence of the weights, W_2, acting to the right. One should not be confused by the fact that the two compensating weights are here travelling in opposite directions. They are truly exerting forces to the right, as they are at this instant at the point of reversal and about to change direction from right to left. In Position 3 all weights are acting along the center line of the screen, but the weights W_2 are opposing the weights W. No forces are now acting crosswise of the screen. In Position 4 the weights W are acting across the screen, neutralizing one another, and the screen is controlled by the weights W_2 acting to the right. It will be readily seen that there is never an unbalanced force acting across the screen. Forces, of course, act in this direction but they do so in pairs, are of equal magnitude and opposite in direction. Fig. 5 also shows the manner in which the two control weights are alternately assisted and opposed by the compensating weights, as disclosed by the analysis of Fig. 3.

In order to keep these four revolving weights turning at the 2 to 1 ratio and always in their proper positions, one with the other, they are placed within four intermeshing cut-steel spur gears which revolve on two shafts, all being driven by one countershaft. The details of the drive head are shown in Fig. 6. This head consists of a cast-steel one-piece frame designed to support the shafts and to make connection to the screen body, which is supported by pedestals. This frame is carefully machined to templet. The fixed shafts on which the gears revolve are of high-carbon steel, ground to diameter, drilled and provided with "Allemite" grease fittings for pressure lubrication of the roller bearings supporting the gears.

The gears are of cast steel with machined teeth, and the hubs are extra large. These parts are machined to templet, so that all are interchangeable. The weights mounted within the large gears are cast separately and for safety are fitted about the outside of the gear hub. The small gears and their contained weights are cast integral. Provisions are made in all weights for adjustment in "tuning up" each installation. Each gear is supported by two Hyatt roller bearings.

The countershaft of high carbon steel is splined, the heat-treated steel pinions driving the machine being fitted over the splines. The construction is such that the countershafts can be removed, and a pinion replaced within one hour. These driving shafts run in Hyatt

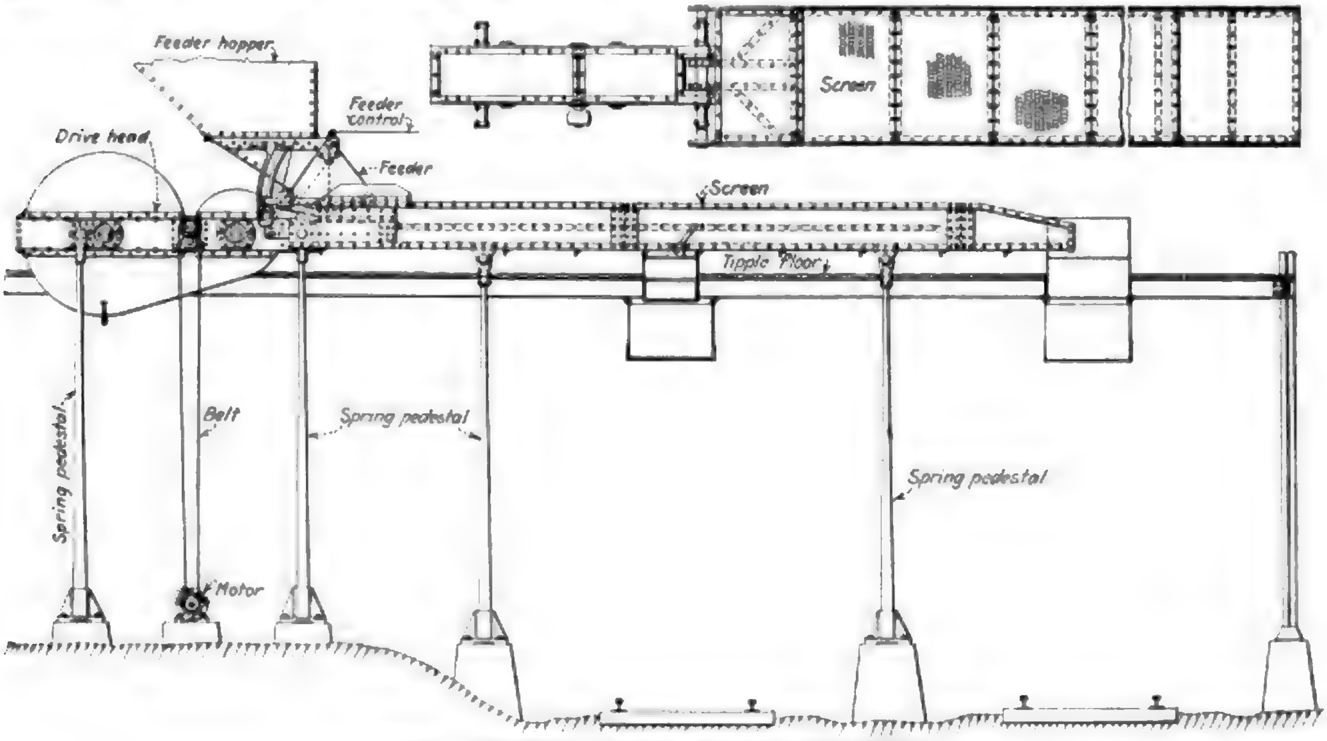


FIG. 7. SCREEN AND METHOD OF ITS MOUNTING

All the parts, both screen and drive head, are mounted on resilient wooden shaker arms. On the left is the feeder hopper, which, actuated by the same drive head as the screen, delivers coal at short, regular intervals.

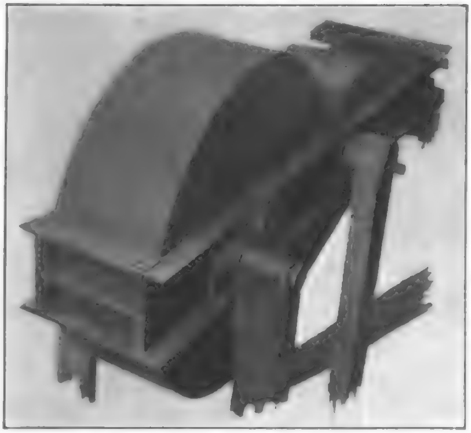


FIG. 8. DRIVE-HEAD MECHANISM

Felt gaskets exclude dust and grit from the working parts. The splash system is employed for lubricating both bearings and gears. Eighteen parts in all, only seven of which are different, are subject to wear and therefore to replacement.

high-speed roller bearings lubricated with grease by the pressure system.

Moving parts of the drive gear are completely inclosed within an electrically welded steel casing, bolted to the main frame. The upper portion of the casing is in two parts to facilitate its easy removal. The bolts holding it in place are provided with lock washers, and provision is made to relieve them of the shake of the drive head. The lower portion of the casing (the crankcase) is filled with engine oil for lubrication of the gears which dip into it. The various portions of the casing are fully felt gasketed to the frame, so that all dust is excluded from the moving parts. Wherever bolted connections are made in the mechanism, castle nuts are used.

A steel shaft extending from one side of the screen to the other and provided with four bearings connects the drive head and screen body. Both head and screen are supported by wooden springs, as shown in Fig. 7. These pedestals consist of a heavy base casting bolted to the foundations and a hardwood tapered upright, set and securely fastened in the socket of this casting, also a cast-steel cap that receives and supports the trunnions of the screen and drive head. This combination gives the necessary flexibility of support to the screen throughout its oscillation. The wood of the spring pedestal is kiln dried and oil treated and is either maple, ash or hickory.

At first glance one might look askance at this suspension arrangement. Intensive tests and investigations, however, have eliminated all elements of chance affecting its reliability. In one of the factory tests the length of the stroke was increased to 24 in. without rupturing or developing any weakness in the wood. As the usual stroke length is only 6 in. the apparent safety factor is 4 +. The real value of this figure was not determined by this test. An added merit in the use of timber pedestals, aside from their action as supports, is the resilience that they possess. The work done in deforming the timbers, during any stage of the cycle, is stored up in them as elastic energy to be later released on the return. Thus no appreciable energy is lost.

The feeder shown in Fig. 7 is of the oscillating type, driven from the connecting shaft through the link motion shown. This feeder is adjustable as to capacity and is thrown in and out of gear by raising or lowering the end of the connecting arms within the curved links. When the link block is in the uppermost position the feeder plate does not move.

Drive heads of this type are made in four sizes, Nos. 5, 5½, 6 and 6½. They are driven by a belt provided with a take-up arrangement. A 9-hp. motor will drive the smaller size, which with a 5-ft. screen will handle 250 tons of coal per hour in a two-track tipple. The screen is provided with gates so that slack, nut, lump or run-of-mine may be loaded with equal facility. When once tuned up the unit is self-controlled and operates uniformly, regardless of the load placed upon it. The variation in the stroke lengths when the screen is running loaded and empty is small. The inherent forces set up by the machine alone do not produce this condition, but the several forces that are operative compromise or counteract each other, so that a balance is maintained under all conditions of load. Thus, with a heavy load on the screens, the inertia stored up in the lumps of coal is great, but the frictional resistance set up between them and the screen surface is increased correspondingly. For a small load the inertia is small, as is also the frictional resistance. What the flywheel is to a prime mover the wood pedestal is to this screen. These members function similarly in their respective capacities, storing up energy and giving it out again when needed, accumulating the surplus and returning it as conditions demand.

DECREASE IN COST OF TIPPLE STRUCTURE

This device considered in its entirety embodies the merits of the best types of screens and in addition possesses several advantages hitherto unobtainable. Thus, while the first cost of the machinery proper is approximately 10 per cent greater than that of an inclined shaker of standard type, the total installed cost is approximately 15 per cent less than that of the old type of equipment because of the decrease in the expense of the tipple structure and because of the simplicity of installation.

Power consumption is small, as this device will operate on one-half the energy necessary for any other type. This device also renders possible more efficient picking than do ordinary horizontal shakers, the effort being the same in each case. The coal is either traveling in one direction or is at rest throughout the entire stroke of the screen, instead of travelling to a certain extent in both directions.

This screen is well adapted to installation in an old tipple because it does not depend for support upon either the tipple frame or on expensive and massive foundations. It operates with little noise, and as the screen structure is absolutely independent of the tipple, the vibration of the building is minimized.

As will have been perceived from the foregoing description, construction of the drive head follows the practice that has proved efficient in the automobile industry. This similarity is particularly apparent in the adoption of the splash system of lubrication and the exclusion of dust and grit from the working parts by means of felt gaskets. Only eighteen working parts in the drive head are subject to wear and, therefore, to replacement. Because of duplication, however, only seven of these are really different. The upkeep cost thus is appreciably decreased.

Can Mine Fires Be Successfully Fought by The Aid of Cooled Boiler Gases?

By **Joseph J. Walsh**
Wilkes-Barre, Pa.

WHICH method is most effective in extinguishing a mine fire is determined largely by the location of the fire and various other conditions connected therewith. Three methods are commonly practiced in fighting mine fires: First, the direct method, in which water or some prepared chemical is used; second, flooding, in which the mine, or that portion wherein the fire exists, is completely filled with water; third, sealing, in which advantage is taken of a condition created by the fire itself, namely, that the inert gases produced by combustion are imprisoned within the fire area by means of stoppings erected around the affected section.

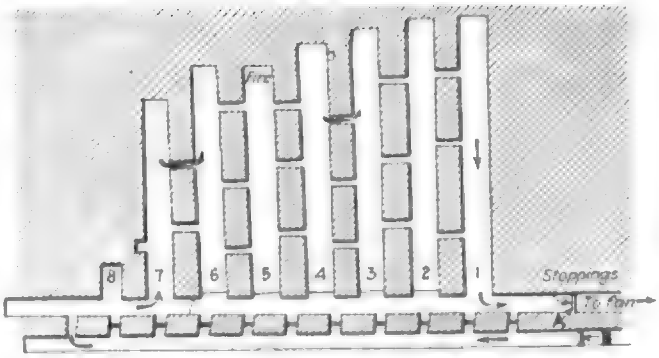


FIG. 2. A FIRE IN A SECTION OF EIGHT ROOMS
Should it be closed off at the intake or return? In either case the air moves till the first stopping is completed, and dangerous gas may pass over the fire. [In each case when the stopping is completed the air has little or no motion, unless there is leakage from or to the surface or from adjacent workings.—EDITOR.]

As this latter method is now quite generally practiced and as there seems to be a difference of opinion as to which stoppings should be erected first—those on the intake, or those on the return side of the fire—it might be well to discuss the dangers attending the sealing of a mine fire, particularly if located in a gaseous mine.

Fig. 2 shows a mine in which a fire exists at the face of chamber No. 5. The stoppings on the return and intake airways are marked *A* and *B*. Stopping *A*, that on the return side of the fire, unquestionably should be erected first, as by so doing the inert gases produced by combustion cannot escape and will, therefore, form a zone around the fire that will smother it. Any firedamp that might accumulate and enter this zone will immediately become so vitiated as to be entirely harmless.

On the other hand if the intake stopping be erected first the inert gases produced by the fire will tend to move to the fan; similarly any firedamp that might accumulate inside the fire zone also would tend to move in the same direction and pass over the fire.

Another condition in connection with the sealing of a mine fire in which the element of danger is serious is found in cases where the fire to be sealed is small. In instances of this kind it is possible, and highly probable, that the atmosphere surrounding the fire may become explosive before the oxygen content is sufficiently reduced to render the inflammable gas inert. In such cases it is advisable to permit the fire to increase in magnitude before seals are erected.

Circumstances surrounding a mine fire may be such, however, that the methods described fail. Such conditions may be found in crop fires, where it is practically impossible to exclude fresh air from the burning section because of the broken strata and the closeness of the fire to the surface. A fire located in an inaccessible part of a mine furnishes another example of a condition that is difficult to overcome by the application of the commonly practiced methods.

In all such cases fresh air, to a greater or less extent, will enter the fire area, and the products of combustion will leave it through cracks and crevices. More than a score of such fires exist at the present time in the anthracite region of Pennsylvania, some of which have been burning for more than fifty years, resisting all attempts to extinguish them. It would seem that the inert-gas method was the most practical for subduing mine fires of this character. A description of this method follows:

This plan contemplates keeping a constant supply of inert gases flowing through the fire area of the mine. The gases used will be those resulting from combustion, chiefly nitrogen and carbon dioxide. The presence of oxygen to the extent of 8 to 10 per cent might be permissible, as an oxygen content of this magnitude will not support or aid combustion. Such gases may be produced by an ordinary furnace such as that of a boiler and are in every respect similar to those found in a boiler stack, except that the excess air must be somewhat lower than usually is attained in ordinary boiler practice.

The quantity of gas required per minute will be dependent on the physical conditions of the fire area, such as the extent of the working and the number and size of the unsealable

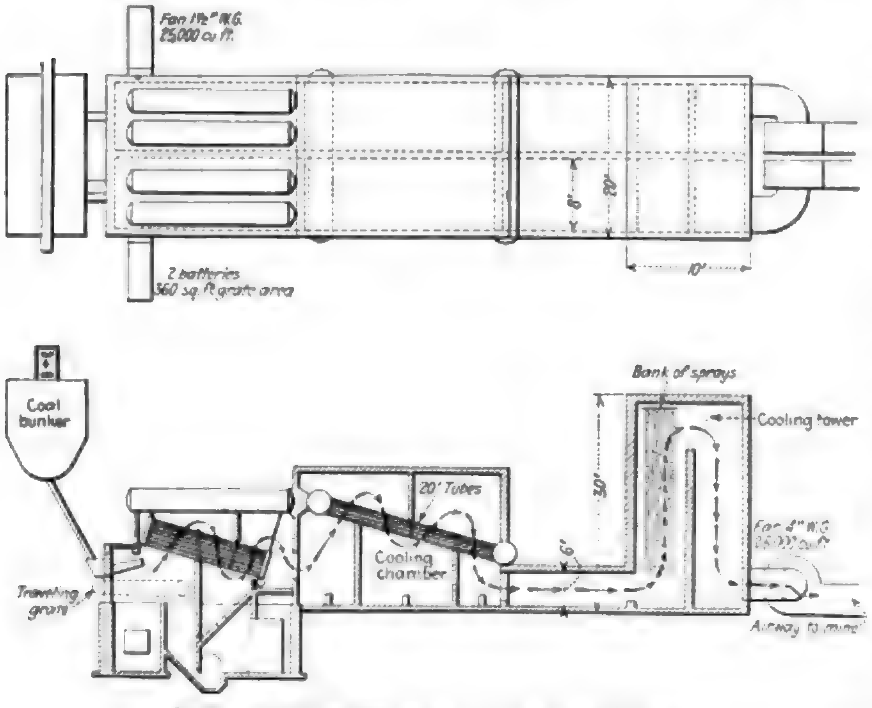


FIG. 1. EQUIPMENT FOR MAKING INERT GAS
In the plan suggested the air is freed of oxygen and loaded with carbon dioxide by burning coal on a traveling grate. The inert gases thus made are to be cooled in a cooling chamber by passing them over twenty tubes containing cold water, and they are to be further sprayed in a cooling tower. They will then be ready for use in extinguishing the fire in the mine.

openings through which the gas may escape before penetrating the fire zone. It would be an unusual condition, however, that would require more than 15,000 cu.ft. of gas per minute.

With a gas containing 8 to 10 per cent of oxygen, the combustion of a smoldering fire would cease instantly. If, however, the fire has an incandescent glow, combustion would continue for a short time, but its extinguishment would be a matter of minutes only.

The length of time that would be necessary to cool the mine sufficiently to preclude all danger of re-ignition after the mine is opened and fresh air admitted, cannot be determined with any degree of accuracy. I believe, however, that under the most unfavorable heat conditions, 15,000 to 20,000 cu.ft. of gas at a temperature of 60 deg. F., flowing through a mine or section of a mine having an area of fifty to sixty acres, would lower its temperature sufficiently to remove all danger of ignition in three or four months.

Fig. 1 shows an installation designed to produce 25,000 cu.ft. of inert gases per minute. The furnace is similar to that of a Babcock & Wilcox boiler fitted with an automatic stoker of the traveling-grate type. This arrangement assures an even fire at all times, thus eliminating the possibility of an excess oxygen content, either periodically or continuously.

After leaving the furnace the gases enter a cooling chamber, where, by reason of properly arranged baffles, they move among tubes through which cold water is flowing. It is estimated that this treatment will reduce the temperature to about 300 deg. F.

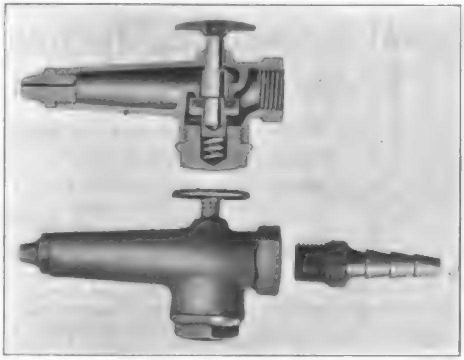
A further and final lowering of temperature takes place in the cooling tower, at the top of which a bank of water sprays is so arranged that water may be sprayed into and through the ascending gases, decreasing their temperature to about 60 deg. The cooled gases now enter the downward compartment of the tower and pass thence to the mine by way of the fan.

Four furnaces with fire grates each 9 x 10 ft., making in all 360 sq.ft. of grate area, will be required to furnish 25,000 cu.ft. of gas per minute. Four tons of rice coal per hour will be necessary for the production of this quantity of gas.

Such a plant may be located at any point convenient to the fuel and water supply. In case the airways leading from it to the mine are long, its effective operation will not be seriously impaired. Such a condition, of course, will require a higher water gage to overcome the increased friction offered by the air duct, but because the fan is of the blowing type the pressure existing within the airway will preclude all danger of fresh air leaking in and decreasing the efficacy of the smothering gases.

Gun for Cleaning Machines by Air Blast

IN MANY mining plants, particularly shops, power houses and substations, but to a lesser extent in tipples, breakers, pump houses and the like, where compressed air is available, it is freely employed for blowing off machines. Not only are chips and dirt thus removed from machine tools such as drill presses, lathes, shapers, planers and the like but dirt, dust and chips are blown from work benches, the hammer slag from bulldozers, and dust from engines, pumps and power-house and electrical equipment generally, including transformers and the backs of switchboards.



AIR NOZZLE FOR CLEANSING MACHINES

A large push button on the top of the nozzle on being pressed opens a renewable disk valve and allows the air to escape at full force. A small spring and the air itself seat the valve as soon as pressure on the button is removed.

So general has become this practice that a demand has been created for a reliable "air gun," or nozzle for the end of the air hose. To meet this Jenkins Bros. have developed and are now marketing the device shown in the accompanying illustration. It is extremely simple in construction and not liable to get out of order. Air flow is controlled by means of the push trigger that actuates a renewable disk valve. This disk seats evenly and tightly under the pressure of a small spring and the air itself. When worn out it may be renewed easily and quickly.

Today, when conditions are such that much work must be done by few men, not only must operation be performed, wherever possible, by mechanical means but these means must be made easy of manipulation and efficient. It is in accord with this idea that the air gun here described has been developed. Light, easily operated and efficient, it not only conserves air but aids in getting work done which otherwise might be neglected or at best slighted.

Few Cases Come Before Compensation Board

THE State Bureau of Workmen's Compensation of Pennsylvania, in a review of the six-year period since its inception, in 1916, calls attention to the fact that but 1.47 per cent of the settlements ever reach the Workmen's Compensation Board.

Out of 386,288 agreements effected only 13,826 cases were assigned to referees for settlement. This is about 3 per cent of the cases that have been brought to the attention of the bureau. The board reviews cases on appeal from referees.

The referees in the ten districts into which the state is divided have awarded compensation in 4,364 cases and have disallowed 2,731 claims. Adjustments before decision was made by a referee made it possible to dismiss 4,379 cases. A total of 931 claims were withdrawn during the six years.

THE SAMPLING OF COALS from the mines of Carbon County, Utah, has been completed by the U. S. Bureau of Mines. A bulletin on the analyses of Utah coals generally is being prepared for publication.

COAL AGE INDEX

The indexes to Coal Age are furnished free to all who ask for them. The index for the last half of 1921 is now ready for distribution. A copy can be had by addressing a postcard to the subscription department of Coal Age.

Equal Strength in Operators' and Miners' Organizations Would Protect Interests of Labor and Producer*

Right to Organize Beyond Dispute—Effective Co-operation Possible Only When Parties Have Equal Power and Responsibility—Open Shop Opposed as Likely to Cause Cut-Throat Competition

By Philip Penna

WE HAVE conceded here today that the mine workers have a right to unionize. It doesn't matter whether we concede it or not, it is a fact. We don't strengthen it by any concession, and it isn't any concession on our part; they have certainly a right to unionize, and any attempt to abridge that right is of a species of tyranny upon which we cannot afford to establish the relationship between labor and the employer in a big industry like the coal industry. Then we must find something else.

It has been said that co-operation—collective bargaining—should be resorted to. I want you to understand that there always have been and there always will be disputes between the employers and the employees and, no matter how strongly we might wish for a different situation, that will always be true.

In that connection let me say something else that perhaps you will not agree with: this idea of mutuality of interest between capital and labor is largely exaggerated. There is not nearly so much of that as we would like to think. Now I am not denying that there is some, because there is; there is mutual interest between employers and employees involving the methods of conducting business, whether it shall be brutal or whether it shall be intelligent, whether we will have strikes or whether we will have reason. Strike is war; that is all it is. Until that question is settled (and that is our great problem today—how to settle it) it must always be before the industrialists of the land.

Recognizing that mutuality of interest, as far as we can now see it, it is not unreasonable to expect that those who follow us probably will see it further than we can. There may come a time when it will be recognized and be made an actuality and influence the business to a greater extent than the most visionary, hopeful individual today can imagine. I like to think that will come, but I don't know whether or not it will; it is not here now, we know that.

Strikes Came as Regularly as the Seasons

Co-operation. Collective bargaining. Thirty-five years ago there were men in this nation who conceived the idea that strikes were brutal, that strikes meant war, that they made children cry for bread, that they destroyed property all over the nation, and just as soon as one strike was settled and before the parties to the conflict had recuperated from their losses and their hardships, before the miners paid their debts where they had gotten credit, and before the operator got his business around to anything like decent shape, then another strike ensued. They came about as often as spring and autumn, and everybody was injured; nobody profited from them. The coal operators grew poorer and the miners would have if such a thing had been possible. There was physical suffering.

There were some men that met in Indianapolis Sept. 8-12, 1885, and they were not employers of labor, either; they were not coal operators; they were a bunch of men inured to the hardships of the mine. They met there from various states in the Union, and they passed a resolution something like this:

"Whereas, strikes are fundamentally wrong, wrong in principle, wrong in practice, and should, if possible, be avoided, therefore be it

"Resolved, that we petition the coal operators of the States of West Virginia, western Pennsylvania, Ohio, Indiana and Illinois to meet us in a joint convention where we will sit down around the table and thrash out our difficulties and forever dispense with the brutal strike."

Understand there were not any Alexander Howats in that convention. It was made up of men who had gone through a big strike in Ohio which hungered the miners and broke up some of the companies in the Hocking Valley in '84. Some of you remember it. There was a strike in Indiana for nine months. There was a strike in the Pittsburgh district for three or four months. Braidwood was the seat of war in Illinois at that time and had gone through a strike. The mine workers were anxious to avoid strikes, and together with the operators—it must be said to the credit of the operators, old Oscar Townsend of Ohio, our friends Dempster and Robbins and several from Pennsylvania, Jenny and Yeoman and others from Indiana, Colonel Sweet and Mr. Lemon and some others of those old people from Illinois—started a joint convention. That joint convention was a declaration that the open shop had been tried and was a despicable, miserable failure. Lots of you don't like that, but you cannot gainsay it. It was a miserable failure under which neither coal operators nor coal miners could live.

Open Shop Proved an Industrial Failure

Why, the open shop is as old as the ages, and it is because it couldn't meet and didn't meet and doesn't meet, and until you have absolutely revolutionized human nature, you can't make it meet the demands of our present industrial system. It is true the Constitution of the United States and of the states, and the statutes, both federal and state, in support thereof, give to every man a right to work for whom he likes and for what he likes, provided the other man wants him to work for him; that is true. It gives to the other man the right to employ him or not. That Constitution and those statutes were made before corporations were organized, before the executives in corporations had their legal talent and experts in every department surrounding them; and perhaps it was before a subordinate's advancement in his industry depended upon his ability to cheapen production at the expense, among other things, of the laboring man's wages.

Let us be square. How can a poor individual butt up against a corporation and obtain justice until selfishness is eliminated? How can he do it? Did you ever see it done in your lives? All of you old men, practical men and young men coming along have never in your lives seen an employee enjoy his rights—rights as sacredly and as forcefully guaranteed by the Constitution of our nation as any rights—his civil rights, his political rights, his religious rights, his industrial rights, and defend them under such conditions as exist. How can he enjoy and defend those rights as an individual against a corporation that doesn't want him to enjoy them? He can't do it. It never has been done; it never will be done unless selfishness is not eliminated but modified and made more intelligent. There is such a thing as an intelligent selfishness, I presume.

What should we do? Permit and encourage our men to unionize, provided always that they respect the right of the other man as they demand respect for themselves. If they will not concede you that right, then there should be enactment of law that would compel them to do it or forbid their existence as an organized body. That is the way I look at this thing. Every man should be conceded the right to make a contract. During the process of negotiating that contract every man should be permitted to ask for anything which he thinks he is entitled to. Of course he doesn't always get what he asks for; you understand that; none of us does. After the contract is made, he should be compelled to respect that contract or be just as legally responsible as any other honorable business man is and wants to be.

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*From an address before the American Mining Congress, Chicago, Oct. 17-22, 1921.

I believe that comes nearer to the solution of our proposition than anything else that I can think of. What is the use of talking about co-operation unless it be between two parties of equal strength—then you have real co-operation—or between a dozen parties of equal strength? There should be equality in the negotiation of contracts as between parties thereto. That means organization among the employers. You have got it. You haven't got it to such perfection as you ought to have. It means organization among the employees. When that contract is made they should both be equally responsible and be compelled to respect it.

Now we are told that cannot be done. I don't know whether it can or not. I know some big men in this nation have said that it cannot be done, and other equally big men have said it can be done. At the present time we don't know just what the legal responsibility of the trade union is or what it amounts to. There are some cases now pending in our courts that sooner or later will be determined and will make matters clearer to us than they have been at any time heretofore.

Judge Hughes said: "Incorporated unions are not persons and cannot be sued as such, and the members of those incorporated unions cannot be sued as members thereof." That was Judge Hughes' attitude in some of those trials in the past. There is only one answer at the present time, seemingly, that answers the quest as to what the law is as affecting us, and that is Aaron Burr's definition of law—that it is forcibly presented and plausibly maintained. But because of the chaos—because of the uncertainty, rather—that exists at this time, it does seem to me that if all of the people who are interested in those questions, and especially the American Mining Congress, could agree among themselves and could agree in themselves as to the policy and then pursue that policy, and ask our law-making bodies, our legislatures and congress, for a little while to suspend their rules of political expediency and get right down to honest-to-God work and make some laws covering this question, it would solve the problem.

MINE WORKERS' NOW A LAWLESS ORGANIZATION

Then what would we have? We would have peaceable relations and operations. You men know we had it for a good many years, don't you—long, long years ago? The mine workers' organization then was not seriously complained of; it was not accused as a lawless body, and I want to say to you now that the accusation is true. The mine workers' organization to-day has got to the point where it has no respect for its own laws, no respect for law or order or decency; a defiant, autocratic, lawless mob. The other day I was talking like I am now and a fellow said to me, "You are only getting some of the things that you started out after. Serves you right!" I don't know but what the point was in a measure well taken. While I am talking about the right of the trade unions, I am not talking about the trade union that is not in accordance with law.

What would we have? We would have a legally responsible body of men on both sides; we would have no strikes; we would have conciliation and arbitration in preference as a method of settling disputes. The nations of the world adopt that method; that is, when they are of equal strength. This country and Great Britain would arbitrate; you know that; any dispute would be arbitrated. We must have equality, that is all. The mine worker must be able to defend his position, to defend his rights. They are as sacred to him as yours are to you, and he is entitled to enjoy them to the full, just as much as you or any other man.

The mine worker is not going to make a union and allow you to write his constitution and rules and by-laws. He is going to write them himself; he is going to make a union to protect his rights that are sacred and valuable, and he has a right to, just as much as you have. If the mine workers attempt to do more than that, then there should be legislation in the shape of the big stick that will make them decent.

I want to tell you there are a whole lot of coal miners in America to-day who are decent and want to be decent and don't belong to the lawless element. There are lots of good men among them who would like to have just such a union as I have dreamed of and as I am trying to speak of now. We would have a union strong, able to defend its rights; you would be strong, able to defend yourselves; and then like two strong nations—Great Britain and America—neither one of you would want to say fight; you both would want to sit down to the table and adjudicate your differences and settle them on a basis of equity. Further than that, if there should then come the time that you could not agree with your men and they could not agree with you, some honest difference arising, then invite the public—the American public—and have the public do for that industry what it had demonstrated its inability to do for itself. The public has a right to do that; it has no business interfering in our affairs until we have tried—not a bit in the world. We ought to be allowed to try. When we fail, then it has the right to take us over and say, "Gentlemen, you are incapable and we will do for you what you have failed to do for yourselves."

OPEN SHOP WOULD EMBARRASS OPERATORS

This open-shop proposition is only a fad, you know. As far as the coal industry is concerned it is only a fad. What would you do with it if you had it? If you had a union of the mines, a little union at the mine, or if you didn't have any union and you got right down close to your employees and sat down talking with them, you would make a scale of wages, and over here would be the other gentleman doing the same thing. He would make a scale of wages, and all along the line in the same district and inter-districts you would all make scales of wages and you would all make them different. The American consumer isn't going to give the man with the high-cost production a little more money because he didn't have as much skill or had a little too much humanity in dealing with his labor. No, he is going to buy his coal where he can buy it the cheapest. Then what happens? Well, I would go out and have a meeting with my men, I would get in close touch with them and say, "John and Bill, my trade is gone; that fellow over there, Harry Taylor, went out and talked to his men the other night and they took a 5c. reduction from their wages. I've got to have a 7½c. reduction to get back that business or I can't get along. You know, Bill, your family needs your work and you know we are friends and we don't want to shut down our mine. That fellow Taylor has done that very thing. Now you take the reduction and I have got my 2½c. to the good. I will go out and take his trade then." As foolish as that may sound to you, that was actually the rule of life in the coal fields of Indiana, Ohio, Pennsylvania and your great State of Illinois. What I say is true. Some of you old men back there know it is.

That is the way it would be again tomorrow, but we can't live that way, and you know it. We must have uniform cost of production, as near as physical conditions will permit, and after we have done all that we can toward that uniformity, there is still enough irregularity in the physical conditions to make a great difference in cost of production, but we must do our part; we *must* do it. We have ceased to be a little community industry; we have ceased to be a little state industry; we are a national industry and the railways have eliminated to a very great extent any exclusive markets; we don't have them any more. We have got to go out and compete with each other and the world, as far as this country goes, and it is getting to be more so now; the world is our market.

I believe heart and soul in union labor, in union of employers, in collective bargaining, in responsibility before the law, absolute and equal with all parties affected, and the man that doesn't want it and won't submit to it voluntarily, by the eternal should be made to do it or be put in jail.

IN VIEW OF THE DEVELOPMENT of the surface stripping method of mining coal in different fields, the Bureau of Mines has undertaken an inquiry into the present cost of steam shovels used in coal-stripping operations.

Problems of Operating Men

Edited by James T. Beard

Ventilation by Continuous Current

Plan of Ventilation by Continuous Current Requires Taking Special Precautions in Driving and Timbering the Rooms—How the Continuous-Current Plan Varies in Arrangement from That in the Split System

SOME time ago a question given in a recent first-class examination, at Birmingham, Ala., and answered in *Coal Age*, Nov. 17, p. 809, had reference to the instructions to be given men, in respect to the working of their rooms when driving under bad roof, both when the mine was ventilated by a continuous current and by the split system of ventilation.

As stated in the answer to this question, its actual meaning is very obscure, which makes it difficult to give a satisfactory answer. At the same time, it seems to me that I am able to sense the meaning intended, by drawing on my practical experience in Alabama mines. The question reads as follows:

> In a mine employing a continuous air current for ventilation and the air-courses where the use of timber is necessary for support of the roof, how would you instruct your men in reference to working their rooms? Would you use the same method on the split system? Explain.

There seems to be apprehension, in the mind of the person who formulated the question, regarding the future safety of the mine by reason of the bad top, making it necessary to use special precautions in timbering both the rooms and the air-courses.

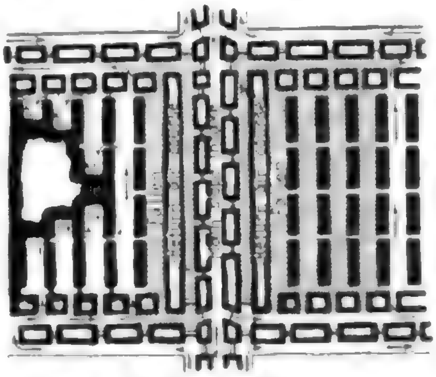
Why Special Care Is Needed

The question of timbering becomes a serious consideration, in a mine where it is necessary to maintain the original air-courses a considerable length of time, as is common in the continuous-current system of ventilating. The use of a continuous current requires frequent retimbering of the roads and air-courses, particularly here, where no preservative treatment of the timber is employed owing to the plentiful timber supply in this state.

Taking these things into consideration, it is clear that to avoid expense, every effort must be made to cut out the air-courses and carry the air in as direct a route as possible throughout the mine. With this end in view, I have prepared a sketch, shown in the accompanying figure, illustrating a plan of ventilation that makes it possible to cut out the air-courses and shorten the distance of air travel as rapidly as possible.

The plan shows the section of a mine in which the main entries are driven three abreast, the middle entry being the main intake for the entire mine, while the two side entries are the return air-courses for their respective sides of the mine. The mine is developed on the advancing plan.

It will be observed that all the rooms are driven to within a short distance of the air-course above and then holed through into that air-course. This feature makes it possible to carry the air current through the last room that has holed into the air-course when ventilating on the continuous current system.



PLAN SHOWING ADVANCING ON RIGHT AND RETREATING SYSTEM ON THE LEFT

In the figure, the section on the right of the main heading illustrates a plan that is adapted to the ventilation of a mine generating little or no gas. On the other hand, the section on the left of the main heading shows a plan of ventilation that should be adopted for the ventilation of a gaseous mine. In each of these sections, the hatched portion illustrates the portion that has been abandoned and allowed to fall in.

Advantage Gained by Coursing the Air Through the Rooms

The advantage of the plan here shown is readily seen from the large extent of air-courses that have been abandoned and allowed to fall in as the work has progressed. Assuming the rooms are driven on 40-ft. centers, it is seen that each room that holes through into the air-course makes it possible to eliminate 40 ft. more of airway and save that amount of retimbering.

As each new pair of cross-entries is driven and the work develops to the extent that the first room has holed through into the air-course above, it is possible to abandon the length of main air-course extending between these two pairs of headings, the return air being then carried through the first room, instead of circulating through the return air-course, as before.

Rooms Must Be Well Timbered to Prevent Their Closing

Now, with this explanation, let me suggest that each room, as it is driven up and holes through into the air-course, becomes itself an airway on which the entire circulation of the mine depends. Under these conditions, it is clear that special instructions must be given to the men, with respect to driving their rooms at a uniform width and taking every precaution to timber them securely to prevent their closing before the next adjoining room holes through into the air-course.

This, I take it, is the real meaning of the question asked and the instructions necessary to be given the men would differ widely from what would be required in the employment of the split system of ventilation.

If this is not the right meaning, I hope we shall hear from some member of the examining board, who will explain the meaning intended by the question. I know that many who have taken the examination and others preparing themselves for following examinations are watching these answers in *Coal Age*, and it is important that their meaning should be fully understood.

Bayview, Ala. JOHN WALL, SR.

Economy in Mining Coal

Economy starts with plan adopted—Advancing plan brings quick returns—Strong prejudice of old-time miners hard to overcome.

I WAS strongly impressed with the remarks of Fred Ross, a Kentucky mining engineer, in his letter, *Coal Age*, Dec. 15, p. 966, and the economical arrangement shown in the plan of mining he there presents.

In the mining of coal, it is of the utmost importance to adopt a plan that will prove economical and bring the largest results in the quickest time. This is particularly true in respect to our American mines.

Advancing Plan Brings Quick Returns

Mr. Ross has written with particular reference to the concentration of work, by maintaining a regular line of robbing when drawing back the pillars. In speaking of the relative merits of the advancing and retreating systems of working, he appears to prefer the advancing system as yielding the quickest returns on the investment.

For several years, I have advocated the adoption of this plan, but have never had the opportunity of fully carrying out my ideas. I am glad to see this plan presented in so clear a manner, as it cannot fail to be of great benefit to mining engineers and managers if they will study the plan carefully and follow it out in the development of the mine.

In my opinion, not only does the plan provide means of efficient ventilation and concentration of work, but it will yield a maximum percentage of coal per acre, and minimize the danger of creep or squeeze occurring in the workings, provided the details of the plan are carefully followed.

STRONG PREJUDICE OF FOREIGN MINERS HARD TO OVERCOME

One of the great drawbacks in American mining, in respect to the adoption of economical methods, is the large number of English, Scotch and Welsh miners in charge of the work in our mines.

As a rule, the majority of these men have gained their experience in a single locality or district. They are largely men of one idea and it is difficult to impress them with the advantage of a new plan. Their reply is always, "It was never done that way in the old country."

Not knowing the nationality of Mr. Ross, I believe I am safe in saying that the plan he has presented is the most economical plan of any I have ever seen advanced. If properly worked out, making only such changes as may be necessary to conform to the pitch of the seam and provide good haulage and ventilation, it is bound to prove successful. I would like to see the comments of others regarding it.

JAMES F. GAMILLE.

Fredericktown, Pa.

Waste of Mine Timber

Sending unsuitable timber into the mines the cause of great waste—Such timbers thrown aside and lost in the gob—More system needed in ordering and delivering timber at the coal face.

NOT long ago, *Coal Age* writers discussed the question of cutting mine timbers to the proper length in the rooms, as compared with sending it into the mine already squared and cut. It seems to me that the argument in favor of cutting timber to length after it has reached the working face must come from men who have worked in mines where there was no system or discipline.

There is no doubt in my mind but that many accidents are caused by sending unsuitable timber into the mine, to be cut by the miner. It is seldom that a miner will lay aside his work of digging or loading coal and take the time to cut the timber needed. On the other hand, if the posts are already cut to the proper length it takes but a few moments for him to set the timber needed to secure the roof and make himself safe.

Aside from this practice being the cause of avoidable accidents, it is also the direct cause of a large waste of timber that is thrown into the gob for lack of time or tools to prepare it for use. Timber thus thrown aside is quickly lost sight of and is gone forever.

SCARCITY AND HIGH COST OF TIMBER CAUSES CONCERN

Today, the cost of mine timber is becoming more and more a matter of concern. To reduce this cost to the lowest possible limit, it is necessary to curtail this waste of timber to which I have just referred. In no way, can that be done more effectually than by establishing a system by which suitable timber will be sent into the mine ready for use.

Close observation at a number of mines convinces me that the one thing most needed is an effectual system in this respect, as in other things in the operation of a mine. In my state, much trouble and inconvenience has been experienced in supplying the right kind of powder to the men.

In order to avoid the trouble, a system has been adopted in many mines more recently, by which each miner makes his order out on a duplicate check, naming the kind of powder wanted and signing the order. One part of this check goes to the office, while the other follows the powder, until it is delivered at the proper place.

SYSTEM IN DELIVERING TIMBER NEEDFUL

Now, if this system has been found to work successfully in regard to powder, why cannot a similar system be used in reference to the ordering and delivering of timber. At present, the trouble lies largely with the drivers. The timber is sent into the mine, perhaps, already squared and cut to different lengths. On its arrival at the inside parting, the drivers generally take the timber most convenient to them and haul it into the working places, without regard to where the different lengths should be delivered.

As a result, there is much of this timber that cannot be used where it is sent. The short sticks may be taken to rooms working high coal and longer sticks delivered to miners working low coal. When timber goes thus astray, it is practically lost, seldom if ever being reloaded and taken where it can be used.

In closing, let me say that it is just as important to systematize the delivering of timber, as it is to do this in supplying powder to the men. Where system is lacking, a post once set is generally not thought of again. How much could be saved by drawing and using again much of this timber instead of leaving it to be lost in the waste, as is commonly the case.

Linton, Ind. W. H. LUXTON.

How Vagaries of Foremen Affect Cost of Production

Foremen dissatisfied lose ambition—Work suffers from lack of attention—Mine often damaged beyond repair—Cost of production increased in effort to restore the mine—New foreman unjustly blamed.

FROM time to time, mention has been made incidentally regarding the increased cost of producing coal, by reason of one thing or another. One writer, I recall, referred to the difficulty under which a new mine foreman labored when called to take charge of a mine that had been poorly managed by the man who preceded him. This, to my mind, introduces a fact that is well known to a multitude of mine foremen and which has an important bearing on the cost of production of coal in many mines.

WHEN A FOREMAN IS DISSATISFIED

A mine foreman becoming dissatisfied for any reason will often lose his ambition to make good. Under these conditions, the man who is not truly honest and has a sincere regard for the welfare of his company takes little interest in the matters of cost and production of coal. In the mine, conditions go from bad to worse, until the time arrives for the company to look for another foreman.

At two different times, it has been my fortune to be given charge of a mine where the previous foreman had fallen into disfavor with the company, for a considerable period of time before he was compelled to give up his position. It is remarkable the amount of damage that can be done to a mine in a short time when the foreman's interest wanes and he loses his ambition or desire to work in the interest of the company who employs him.

Frequently, it happens that a mine is damaged beyond repair, by reason of an indifferent foreman endeavoring to keep up the daily tonnage and reduce the showing on the cost-sheet by getting out cheap coal and doing no development work to provide for the future.

THE COST TO THE COMPANY

The cost of such a man to the company is seldom fully revealed, until he leaves and is succeeded by a capable and honest worker, who undertakes to repair the damage done and restore the mine to a paying basis.

For a considerable period, it may be several months, there is much deadwork to be done in the way of retimbering the air-courses and driving entries, before rooms can be turned that will furnish a fresh supply of coal. In the meantime, the cost of operation mounts high and the management begin to wonder whether or not the new man is a success, notwithstanding his previous record in other places.

Just here, comes in the value of a practical superintendent who is thoroughly familiar with mining conditions. He is the only one who can explain to the satisfaction of the management the reason for the present high cost of production and defend the new man from being unjustly accused.

Without overstating the case, I believe it is a fact that many mining companies have spent thousands of dollars in replacing the damage done by incompetent foremen, or such as have lost their ambition to work in the interest of the company and are ready to resign at any time, or are looking forward to being discharged at an early date.

A New Foreman Meets Difficulties; Give Him a Chance

While I am a mine foreman myself and believe that a foreman should have a fair chance to make good, at the same time I firmly believe every foreman should do his best for his company, as long as he is in their employ. The foreman who will not do this should be punished in a way that he will remember. It would be a boon to mining if his name was to be published in coal-mining journals and his record made known to the industry.

The type of foreman I have mentioned not only subjects any company who may employ him to unnecessary expense, but he forces the man who follows him to assume an unjust burden, by reason of his previous lack of attention to the work in his charge. In my opinion, there should be some provision made by which the certificate of such a man should be withdrawn if he has one.

It is not necessary to guess what proportion of mine foremen are of this type, it is sufficient to know that there are such men in charge of some of our mines, and our efforts should be made to eliminate these as far as possible and rid the mines of the damage they cause.

Mayport, Pa. JAMES THOMPSON.

Ability to Lead

Leadership is born in men—Confidence in one's self a factor—Close student of human nature—Personal contact with men insures mutual understanding.

READING the letter of a "Western inquirer," which appeared in *Coal Age*, Dec. 29, p. 1055, one can but agree with him that it does seem, at times, as if the man who can put up the best talk is usually the one to get the job.

However, no man can successfully handle a coal mine who fails to gain the confidence and respect of his men; and the only way to secure that is through personal contact with the workers, which insures a mutual understanding on the part of each.

The day of the hard-boiled boss has gone and the mine manager who is to make a success now and in the future, must be a close student of human nature. He must know why Bill Smith will make a better tracklayer than Tom Jones, although Jones can do the work about as well, but has not the natural bent required in laying track.

Again, the boss must know how to bestow praise and when to blame a man In short, he must have a natural insight that will cause him to take the right stand, which the men will accept as just and fair.

Leadership is born in men. I would that "Western inquirer" could read the excellent letter of George Edwards, which appeared in the issue, Jan. 12, p. 52. Speaking of the successful boss, Mr. Edwards says he is "a leader of men, standing head and shoulders above the ordinary workman, mentally."

At the same time, the chief characteristic of this man is described as being "the favorable consideration he gives to all who come to him." Knowing himself, how to do the work in hand, he is able to meet his men on an even footing.

In other words, he is fitted for leadership by virtue of his experience. In regard to technical knowledge and training he must, of course, have that also and use it every day in the management of the mine and in his judgment of the work accomplished.

Our friend from the West has spoken of men "who are recognized as being popular, largely because they can tell funny stories." He seems to forget that we are all, more or less, grownup children and enjoy a good story.

As to that, let me say that there is nothing I know of which will relieve a tense situation and soften the feelings among a bunch of men who are working at a dangerous job, than a little harmless banter from the foreman.

Hillside, Ky. E. A. COMELTE.

Inquiries Of General Interest

Problem in Geometry

Principles of Geometry Often Applied in Construction, Though More Frequently Still Found Useful in the Work of Surveying and Plotting, in Connection with Mining

IN THE course of my work in construction, a problem has arisen that seems simple enough in its nature but which I have been unable to solve and am taking the liberty of asking help from *Coal Age*.

Without going into the details of the actual case, the question resolves itself into showing that an ordinate, at any point of a chord subtending the arc of a circle, is a mean proportional between the perpendiculars dropped, from the extremity of the ordinate, onto the two tangents to the circle at the respective extremities of the chord.

For example, referring to the accompanying figure, ACB is the arc of a circle subtended by the chord AB, and CO is an ordinate at any point O of the chord. Then, from the outer extremity of this ordinate, draw CD and CE perpendicular to the tangents AD and BE, respectively. Then, I want to prove that the ordinate CO is a mean proportional between CD and CE; or, in other words,

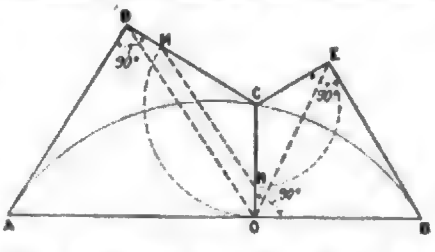
$$CD : CO : : CO : CE$$

If *Coal Age* will show the method of proving this proportion, it will assist me greatly in my work. STUDENT.

————, Colo.

This is a simple problem in geometry. Referring to the accompanying figure the angles DAO and EBO are equal, being measured by the same arc ACB, according to a principle of geometry the angle between the chord of a circle and the tangent at either extremity of the chord, is measured by one-half of the arc subtended by the chord. Again, in the two quadrilaterals $ADCO$ and $BECO$, each of the four angles, at D, E and O being right angles and the angles at A and B being equal to each other, the two remaining angles DCO and ECO are equal, each to each. Now draw the lines DO and EO forming the triangles DCO and ECO.

The next step is to show that these triangles are similar, in which case their corresponding sides will be proportional. To do this, with C as a center, swing the triangle ECO in a clockwise direction, until the line CE falls on CO, making CN equal to CE. The line CO will then fall on CD, making CM equal to CO, since the angle ECO is equal to the angle OCD. The line EO will then take the position NM, which is parallel to the line OD, making the triangles CMN and CDO similar and giving the proportion



$$CD : CM : : CO : CN$$

But, by construction, $CM = CO$ and $CN = CE$, which gives the desired proportion.

$$CD : CO : : CO : CE$$

Let someone now prove that the lines NM and OD are parallel lines.

Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

Question—*Assume that a miner is working in a room with top that will stand for a few days before a fall of slate would occur. The miner does not set props as he should. How would you handle the miner, assuming that he did not actually work under very loose slate?*

Answer—The miner should be given instructions to maintain constantly a row of props across the face of his room, at a specified distance from the face, say not to exceed 10 ft. As the face is advanced a second row of props should be stood, say 4 ft. inside of the first row, before any props in that row are drawn. He should be supplied with the necessary timber and, failing to obey these instructions should be made to suffer a suitable penalty, according to the judgment of the foreman in charge. He should be made to understand that the rule regarding the timbering of his place is absolute and must be obeyed.

Question—*What is meant by a 2 per cent grade? What grade will cause a well oiled car to start in motion from rest?*

Answer—A 2 per cent grade is a grade that rises a vertical height of 2 ft. in a horizontal distance of 100 ft. The grade on which a well oiled car will start from rest, will depend not only on the kind of bearings with which the car is equipped, whether plain or roller bearings, but also on the size and kind of wheels and the condition of the track. On a well ballasted track laid with good iron and using cars having 12-in. wheels with roller bearings in good condition, a car will tend to start from rest on a grade of approximately one-half of 1 per cent, which corresponds to a track resistance of 10 lb. per ton of moving load. With plain bearings, under like conditions of wheels and track, a 1 per cent grade may be required to start the car. This will correspond to a track resistance of 20 lb. per ton of moving load. Cars with smaller wheels and with track in poor condition, the starting grade may increase to one and one-half or even two per cent, corresponding to 30 or even 40 lb. per ton of moving load.

Question—*What form of airway will give the most air with the same power, and why?*

Answer—For the same length of airway that form which presents the smallest perimeter, for the same sectional area, will pass the largest quantity of air, under the same power. On that basis, the circular airway comes first; the ellipsoidal airway next, until the major axis of the ellipse exceeds 2.73 times the minor axis. In that case, the perimeter of the ellipse is equal to that of a square airway having the same area. Then, the square airway is third, in the list, and the rectangular or trapezoidal form last.

Question—*How and where would you construct and ventilate a stable in a mine?*

Answer—First, the stable in a mine should be located in a solid pillar of coal, at the nearest convenient point to the workings, and close to a shaft or other mine opening through which the mules can be rescued promptly in an emergency. Second, the stable and its furnishings must be constructed wholly of incombustible material. Even the face of the coal should be treated with a good coating of gunite, which will preserve the coal and keep it from firing. The stable should be well drained and have a hard concrete floor. It should be ventilated by a scale of air taken from the main intake and discharged, after passing through the stable, into the main return airway. The location of the stable near a mine opening will facilitate the handling of feed and refuse to and from the stable as well as the hasty removal of the animals in case of emergency or disaster.

Question—*A mine car is 6 ft. long, 4½ ft. wide and 2 ft. high; if 12 in. of topping is allowed, how many tons of coal will this car hold?*

Answer—The cubic contents of this car, including the topping, is 6 × 4½ × 3 = 81 cu.ft. It is customary to allow 40 cu.ft. of bituminous coal to a short ton, or the same amount to a long ton of anthracite. The capacity of this car is therefore, say 2 short tons of bituminous coal or 2 long tons of anthracite.

Question—*If you have 250 diggers, in a mine using electric haulage, how many cars in your judgment will be necessary?*

Answer—Assuming an average of, say 2½ tons of coal per man, per day, the output of this mine should be 2½ × 250 = 625 tons. Then, using 2-ton cars, the number of cars in use will depend on the length of haul or the number and size of trips that can be made in a day. Again, assuming a single electric locomotive, making twelve trips a day and hauling 625 ÷ 12 = say 52 tons a trip, the number of cars in the trip being 26, there should be one trip of cars in the mine, loading, another trip in transit, and another on the tipple in course of being dumped, making 3 × 26 = 78 cars in actual use, for hauling coal. Besides this number, allowance should be made for, say 25 more cars loaded with timber and other supplies and, perhaps, about the same number in need of repair or standing in rooms that are idle. This would make the total estimate of cars needed for the operation of this mine, say 125 cars.

Question—*With a fan running at uniform speed (r.p.m.), what conditions may develop that would change the mine-air pressure?*

Answer—The pressure on the mine air is due to the resistance offered by the mine airways to the passing of the current and is measured by such resistance. While it is true that the mine pressure is *created* by the action of the fan, it is *caused* by the mine resistance. Without this resistance, as when the fan is discharging directly into the atmosphere, there would be no pressure on the air. It is clear, therefore, that the mine airways have a certain resisting power, which depends on the extent of their rubbing surface and the velocity of the air current, always assuming there is no obstruction present in the airways that would increase the resistance.

With the fan running at a constant speed, anything that increases or decreases the resistance of the mine will cause a corresponding increase or decrease of mine pressure in the fan drift, as indicated by the reading of the water gage at that point. For example, a fall of roof may so reduce the sectional area of the airway as to obstruct the flow of air. This would correspond to an increase in the mine resistance and will cause a rise of pressure in the fan drift. On the other hand, should a door between the main intake and return airways be set open, the air current will be short circuited at that point and the mine resistance correspondingly reduced, which will be followed by a fall of pressure in the fan drift.

Question—*What effect, if any, has mine ventilation on roof conditions and what method would you adopt to remedy or prevent it?*

Answer—The flow of air through mine airways frequently has a disintegrating effect on the roof of the airways, depending on the nature and susceptibility of the roof stratum to the action of the air. This is particularly noticeable where the roof strata contained water, which is evaporated by the air current as it seeps through the roof. The cutting action of the air current is more noticeable at the ribs supporting the roof, where the pressure is most felt and assists in breaking up and disintegrating the strata at that point.

Where the roof of an entry "cuts," as we say, or is cut by the action of the air current, there is no practical remedy to apply to prevent it, except by leaving a foot or so of roof coal to be taken down when drawing back the pillars. Leaving this coal for the protection of the roof will depend on the thickness of the seam and the character of the coal. It will not always be possible to apply this remedy.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

GENERALLY speaking a business has done well to make the transition from the high level of prices to the low level now prevailing without either loss or profit, according to a bulletin on business conditions issued by the National City Bank of New York. "It cannot yet be confidently said that the bottom has been reached in all lines," the bulletin continues; "on the contrary, there is reason to believe that in manufactured goods costs have yet to be materially reduced. On the other hand, the industries that have to do with primary products probably are on safe ground.

"No marked change has appeared in general business conditions. The outlook for house-building is better than for any other construction work and is counted quite promising. There is some giving way in prices of materials and of wages.

"The iron and steel industry is about as in December, which showed some falling off from the fall months. The output of pig iron in the year 1921 was 16,670,000 tons, the smallest since 1908. In 1920 the production was 36,925,987 tons and the average for 10 years was 31,566,355.

"The railroad labor situation would be ludicrous if it were not so serious. The rates fixed by the Labor Board for common labor are so far above those prevailing outside of the railroad service that the companies are finding it practicable to contract out much of their work and save 20 to 30 per cent, which of course is after the contractors make a profit.

"The processes of readjustment are working slowly, but undoubtedly progress is being made in restoring the industrial balance which is necessary to full industrial activity.

"Coal shares with railroad charges a greater responsibility for the industrial depression than is borne by anything else. The situation will not be righted until transportation and fuel are both cheaper. The remedy for the distress of the coal miners is not in higher wages and dearer coal but in cheaper coal and steadier employment. Nothing but disappointment will come from blind disregard of economic law.

"In so far as the prospect for better prices is due to a general restriction of production we do not believe it signifies a real improvement of conditions. Higher prices will make living costs higher for the town population and tend to retard the readjustment of wages in the town industries, while the farmer can gain but little by higher prices for a reduced output.

"What the workers in all the industries really want in the last analysis is plenty of each other's goods, and that is not to be had by the narrow policy of restricting production in order to put prices up on each other."

Freight Loadings Still Gaining

Cars loaded with revenue freight during the week ended Feb. 4 totaled 753,886, compared with 743,728 during the previous week, or an increase of 10,158, according to the American Railway Association. This was 54,168 cars more than were loaded during the corresponding week in 1921 but 8,794 less than during the corresponding week in 1920. Coal loadings totaled 185,151 cars, a gain over the preceding week of 4,185 and 27,597 above the total for the corresponding week last year.

Glass Factory Reopens

The Greensburg Glass Co., Greensburg, Pa., after several months of idleness, has resumed, and the management expects to keep a force of men at work all summer.

Reading Places $5,000,000 Order

Orders for $5,000,000 worth of new equipment were placed Feb. 13 by the Philadelphia & Reading Railway Co. The orders call for fifty passenger coaches and 2,000 steel coal cars of seventy tons capacity. The Wilmington (Del.) plant of the Bethlehem Steel Co., will build the passenger coaches. The order for the coal cars has been distributed among plants in Middleton, McKees Rocks, Johnstown and Berwick, Pa.

Typewriter Plant on Full Time

The L. C. Smith & Bros. Typewriter Co. put its plant at Syracuse, N. Y., on full time last week. The factory schedule dropped to four days a week last July. This was increased to five days last month.

Navy Yards Lay Off 4,268

Employes released at navy yards and other plants by the suspension of capital ship construction now number more than 4,000, but no further material reductions are expected, the Navy Department announces. Reports from navy yards and other points give the number of men laid off as follows: Norfolk, 118; Washington, 1,350; New York, 400; Philadelphia, 450; Mare Island, 1,500; South Charleston (W. Va.), armor plant, 450; total, 4,268.

Lincoln Auto Plant to Speed Up

The Lincoln Motor Co. plant at Detroit reopened Feb. 6 with a force of 600 men following its purchase at receivers' sale by Henry and Edsel Ford. An announcement issued by the company stated that production would be speeded.

50,000 Textile Workers Strike

Between 40,000 and 50,000 textile operatives in New Hampshire and Rhode Island, it is estimated, are out of work as a result of strikes called in protest at 20 per cent reductions in wages and increases in the working week from forty-eight to fifty-four hours. Half of the 200,000 cotton mill operatives of New England now are on reduced wage schedules. In New Hampshire the strike is practically Statewide. Two mills in Lowell, Mass. closed Feb. 14.

New Wire Mill in Duluth

A new wire rod, wire, and wire nail plant has been constructed at Duluth by the Minnesota Steel Co., a subsidiary of the United States Steel Corporation. The plant will be ready for active operation by next June. It will have a capacity of about 300 tons per day of various wire products. The new plant is modern in every particular and its location is exceptionally favorable for the trade in the Northwest, as well as for export business from the Pacific coast.

Miners' Convention Adopts "Suicidal" List of Demands

Rebels Assault Lewis Administration in Indianapolis Session and Put Through Five-Day Week and Six-Hour Day Program—Howat Case Is Lost After Bitter Fight—Farrington Appears More Formidable Than Ever

BY E. W. DAVIDSON

THE radical element in the United Mine Workers of America almost upset the reconvened session of the twenty-eighth annual convention, at Indianapolis, which ran from Tuesday morning until late Saturday, Feb. 14-18. On a roll call it came within 121 votes of forcing the Lewis administration to consider the case of Alexander Howat and it scrapped the "conservative" eight-hour day program and put the six-hour day, the five-day week and some new war-like language into the list of demands the miners' organization must make to the coal operators of the country between now and April 1, the date set for a general mine strike in the event of failure to reach an agreement.

Altogether, the rebellious element, directed covertly by Frank Farrington, president of the Illinois district, raised such a hubbub beginning the second day of the session, and rolled up such monumental voting strength from first to last that the administration was staggered. The Lewis forces managed to bar the Howat Kansas case from the convention schedule, thus maintaining the position taken by the International organization last fall, when Howat and his entire group were booted from the union, but the fight was hard and the roll call vote, read as one of the last acts of a most troublous session, gave Lewis but 2,073 to 1,952 for the opposition.

LEWIS AND FARRINGTON ACCUSE EACH OTHER

After the convention adjourned, amid a tremendous din, Farrington charged that the session had been forced to a close by Lewis without giving the rebels a chance to protest a good many of the votes cast for the administration in the roll call. He charged that the administration had padded the lists. Furthermore he declared that President Lewis was not only tottering on the throne but had already fallen.

Mr. Lewis, for his part, charges the Farrington gang with cramming the convention with "hundreds of men of Ilinois and Kansas who were not delegates" and with bringing an element to the session which had no other object than to smash things up generally by whatever means came most easily to hand. He told the convention the movement against him had even degenerated into a campaign of terrorism. He said he had received "hundreds" of black hand letters within ten days before the session, all telling him that it had been decreed at secret conclave that if he dared preside, he would be killed.

All in all, the convention was the most rebellious since 1910, when the International officers, for their own protection, established the now famous "seventh row," which was filled with huskies who rose and threw back every wave of men who tried to reach the stage. Nobody rushed the stage this time, but much abuse was hurled up from the floor at the officers and the will of the administration in decisions of the convention was often trampled.

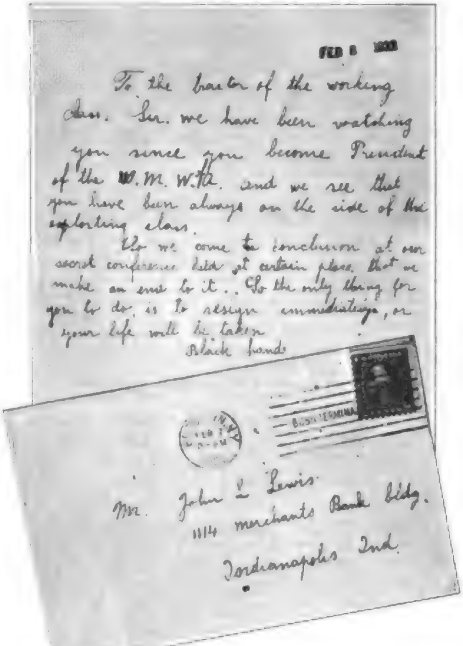
In spite of warnings that radical demands for such things as a six-hour day and a five-day week would prove suicidal to the United Mine Workers of America, the convention was bent upon demanding those very things and the demands were forced through by heavy majorities in standing votes. No roll calls were taken on these matters.

Thus the action of the convention appears to have nullified many efforts of the International officers to frame a program of demands which would appear to the country as "reasonable." However, President Lewis, in a short statement issued just after the stormy close of the session, said he was "convinced that the overwhelming majority of the mine workers throughout the various districts are desirous of following sane policies. The membership has been sadly misrepresented by the many men who are responsible for the disorder which reigned. But the attempt to terrorize and stampede the convention miserably failed. The organization will now be able to go forward with its wage policies and apply itself to its proper affairs.

"In conformity with the plan laid down by the convention," his statement concludes, "I shall, in a few days, issue another call to the operators of the Central Competitive Field for a meeting at an early date to work out a wage agreement, if possible."

Farrington was a member of the scale committee which drafted and signed the original "conservative" report, and said before the convention opened that he was satisfied with the report and "would not oppose it." He didn't—publicly.

The International officers called this reconvened convention to finish the work begun in the regular convention last fall. The entire business was to be the framing of a set of wage demands.



FEB 8 1922

To the baster of the working class. Sir. we have been watching you since you become President of the U.M.W.A. and we see that you have been always on the side of the exploiting class.

So we come to conclusion at our secret conference held at certain place that we make an end to it.. So the only thing for you to do, is to resign immediatelye, or your life will be taken

Black hand

Mr. John L Lewis
1114 merchants Bank Bldg.
Indianapolis Ind.

"BLACK HAND" LETTER RECEIVED BY JOHN L. LEWIS

They prevented the reopening of the case for Kansas, a district in which practically every local charter was revoked and District President Howat and all his officers ousted last fall for failing to call off a strike when ordered to do so. Howat, out of prison under an appeal bond, was allowed to take the platform and tell the convention why it should reopen his case, but he was not permitted to digress for an attack on the Kansas Industrial Court, and in the showdown his plea was denied.

After Howat had spoken and President Lewis had defended the International in ousting the whoe Howat clique, a roll call was ordered. Two days' delay was obtained while voting lists were prepared. This gave the rebels two extra days for missionary work and little else transpired in the convention because the administration would not permit the scale question to come to a vote until it was determined who had a right to cast ballots. The administration got the Howat matter out of the way and the full list of administration delegates from Kansas officially seated before the scale report came up.

To that extent the administration controlled the convention. But it could not prevent the radical element from injecting a good deal of its belief into a union program that was to have been "conservative."

Frank Farrington's protest session Sunday afternoon in Indianapolis did not result in the formation of an outlaw union, as was proposed. Farrington declared that not only had he no intention of trying to split the union now or hereafter but that he would fight any man who tried it. He said that he will keep his pre-convention promise to support the International officers in whatever efforts they may make to get a new wage contract for miners, but, he said, "I don't think they've got any program now that the convention has upset the scale committee's report."

Farrington and Harry Fishwick revealed that on the day before the convention they had told Lewis that if he would advise the convention to reopen the Howat case and reinstate Howat and his crew of outlaw strike leaders, the scale committee's report would not be opposed in the convention. They said Lewis merely sneered at them, so they turned loose the horde which blasted all hope of a conservative scale program.

The Illinois delegation voted to pay the traveling expenses of the Howat men who came to the convention in the hope of winning back their union standing, and pledged itself to crusade for the Howat cause "at least until April 1." Farrington was directed to write "the true story of the Kansas case" and get it into the hands of every miner. Farrington professed that when this is done, the union administration will collapse.

The Howat-Lewis Debate

THOUGH President Lewis succeeded in staving off the Howat fight for a day, the clamor of Howat sympathizers became so insistent on Wednesday that a clash could no longer be avoided. Howat spoke first, whereupon Lewis replied. The standing vote, which followed, resulted in 864 for Howat and 977 opposed. The roll call, demanded by the Howat cohort, was taken Friday, and also resulted unfavorably to the deposed Kansas leader, by 2,073 to 1,952.

Howat spoke about half an hour, trying in vain once to shift the attack to the Kansas Industrial Court law, and President Lewis spoke for about an hour. The convention listened rather quietly to Howat, after the president had accorded him the privilege of the platform, but Lewis was booed loudly when he stepped forward and there were frequent interruptions, which Vice-President Philip Murray had to suppress from the chair. When the two speakers finished, the Howat forces, on a standing vote, won the right to a roll call on the question of whether the convention should consider the matter of Howat's ousting from the union and the revocation of the 72 Kansas local charters.

"I trust we men from Kansas are going to get a square deal from this convention," began Howat, who addressed the convention as "fellow delegates," though the chair persistently called him "Mister" Howat and not "brother" or "delegate." He then reviewed the Kansas situation at the Deane and Reliance mines. "Brothers Steele and Dalrymple came out there and made a so-called investigation," he said. "Then they asked us to go back to work. We were willing at all times to go back under the old conditions, but we refused to do so under the new conditions, such as the operators had imposed.

"In the review of the situation which the International made here in Indianapolis, the officers persistently took the word of the Kansas operators against the miners from Kansas, and finally rendered a decision against us with no investigation at the Reliance mine whatever.

AMENDED REPORT OF SCALE COMMITTEE, ADOPTED BY THE CONVENTION

1. We hold that the mine workers employed in and around the coal mines of the American continent are entitled to receive as compensation for labor performed an annual income sufficient to maintain themselves and their families decently, comfortably and in accordance with the American standard of living. The dictates of humanity, public interest and public welfare demand this be made the preferred claim upon the industry. The present annual earnings of the coal mine workers of America are inadequate—much below a decent living wage—consequently a reduction in mining prices would result in a lower living standard among all mine workers and poverty, suffering and degradation in many mining localities throughout the land.

We do not believe the public asks that its fuel needs be supplied at the expense of a degraded citizenship, accompanied by human misery, starvation and want superinduced by inadequate annual earnings paid to those who mine coal. The cost in sacrifice and human wretchedness is too great.

We, therefore, declare in the most emphatic manner our opposition to any reduction in mining prices and insist that the present basic wage schedules be maintained.

We recommend that inequitable differentials within and between districts, unfair working conditions and internal differences, wherever existing, be adjusted upon a fair and satisfactory basis and the joint conferences in the respective districts be empowered to make such adjustments.

2. Mining is a hazardous occupation. Men engaged in underground toil work under conditions carrying with it an intense nervous strain superinduced by the constant and countless injuries and fatalities which occur and under atmospheric conditions which sap their vitality and make them victims of occupational diseases.

We therefore recommend that all new agreements be based upon a six hour day and a five day week.

3. Where emergencies require such service, overtime shall be paid for at the rate of time and one-half, with double time for all work done on Sundays and legal holidays.

4. We demand that the mine workers' representatives put forth their best efforts to secure a clause in the next agreement providing for the weekly pay.

5. Because of the abuses to which it has been subjected, we demand that the automatic penalty clause be eliminated from the wage agreements.

6. That this convention go on record as favoring the ratification of the wage demands made by the anthracite miners in their tri-district convention, which was held in Shamokin, Pa., from Jan. 17 to 20, 1922, inclusive, and that we pledge to the anthracite mine workers our power and influence in aiding them to the fulfillment of their demands.

7. We recommend that the next wage scale cover a period of two years, beginning April 1, 1922, and ending March 31, 1924.

POLICY

On March 31, 1920, the coal operators of western Pennsylvania, Ohio, Indiana and Illinois, comprising the Central Competitive Field, agreed to the following provision:

"Resolved, That an interstate joint conference be held prior to April 1, 1922; the time and place of holding such meeting is referred to a committee of two operators and two miners from each state herein represented, together with the International officers of the United Mine Workers' organization."

This agreement was entered into in good faith and the coal operators must either carry it out or stand publicly charged with breach of contract. The mine workers' representatives regard this agreement as a moral obligation just as binding as any legal obligation ever assumed and therefore stand ready to discharge it by meeting the coal operators' representatives in joint conference for the purpose of negotiating a wage agreement. Notwithstanding a refusal heretofore made by the coal operators of western Pennsylvania and Ohio, parties to this agreement, to meet in interstate joint conference, we instructed the International officers to call upon the operators of the Central Competitive Field to comply with the agreement they honorably made by meeting in joint conference at as early a date as possible for the purpose of negotiating a wage agreement to become effective when the existing contract expires.

The committee further recommends that the president of the International Union and the presidents of Districts 1, 7 and 9, comprising our anthracite jurisdiction, make arrangements for holding a joint conference with the anthracite coal operators at a mutually convenient time and place for the purpose of negotiating a new wage agreement for the anthracite fields.

The present contract between the coal operators and the United Mine Workers of America in both the anthracite and bituminous coal fields terminates on March 31, 1922. In the event no agreement is reached by April 1 we declare in favor of a general suspension of mining operations, such action being subject to a referendum vote of the membership of the United Mine Workers of America to be held prior to March 31.

For the purpose of meeting in a practical and constructive way all unforeseen emergencies which may arise, a policy committee, composed of the scale committee of the Central Competitive Field, three representatives from each of the outlying districts, members of the International executive board and the International officers, is authorized to take such action for the protection of our best interests as circumstances may require, and to advise the membership upon unexpected developments.

When an agreement is consummated in the Central Competitive Field the outlying districts shall be authorized to enter into joint negotiations for the purpose of concluding wage agreements in conformity with past custom and procedure. Such agreement shall run concurrently with the basic agreement in the Central Competitive Field.

Any wage scale negotiated must be submitted to a referendum vote of the membership affected for approval before it is finally accepted.

JOHN L. LEWIS AND TWO LOYAL CO-WORKERS
At the left is the International president; center, William Green, secretary-treasurer; right, Philip Murray, vice-president.

"Then came the convention last fall. I was vilified by all the International officers and could not get the floor for a reply. But during that convention President Lewis, in answer to a direct question from me, said the miners of Kansas were to go back to work only under the old conditions and that the International would stand back of us to secure them. I went back to Kansas, and it was then that I ordered the men to return to work. But the operators would not have it. They insisted upon the new conditions. We claim, Mr. Chairman, that we did what we were instructed to do and all that any fair-minded man could expect us to do.

"The constitution of the organization provides that the next court of appeal above the executive board is this convention. So we have brought our appeal here. If the executive board is upheld in this case, this is going to be a one-man organization in the future. I hope you won't be influenced by some technicality Lewis may raise. The question before this convention is: Are we going to get a fair and impartial trial? The coal operators of Kansas tried for 15 years to beat me. Now they are getting you men to do it for them."

President Lewis in his reply said:

"I shall not undertake to discuss the merits of this controversy other than to refer to certain features mentioned by the previous speaker. The merits of the controversy are not before the house. I am assured by what I consider to be reputable and responsible authority—a delegate who presumes to speak for and who espouses the cause of the gentleman who is taking the appeal—that there are in this convention 125 men from the State of Kansas who have come here under an organized arrangement not only to disturb the deliberations of this convention and cause confusion in its ranks but to do anything that may be possible to prevent the carrying out in a proper way of the laws of the organization.

"I don't know how many of these 125 men who are sitting in this hall, given the courtesies of the convention, may have been engaged in this organized plot of terrorism which has been carried on in the last ten days or so against the president of United Mine Workers of America. Day by day, mail after mail, I have been receiving letters telling me that if I presumed to preside over this convention—that unless I resigned as President of the United Mine Workers—it had been decreed in secret conclave I would die.

"The question before the convention this morning is the question of the validity of an appeal now filed asking special consideration by the convention of matters pertaining to the revocation of the charter of District 14 and the reorganization of that district by the International union. They say they want a trial, that all they ask is justice, when as a matter of fact for nearly ten months back the International has been doing nothing in the Kansas situation but holding continual trials.

"In the first place, an investigating commission was sent to Kansas to hold a trial on the ground and make an investigation of the real facts in the Deane mine controversy. The committee found that the mine was idle in violation of the contract.

"Later on, the International executive board summoned all parties to the controversy to appear for a hearing in Indianapolis. Representatives of the Southwestern Interstate Coal Operators Association and representatives of District 14 appeared. The decision of the committee of the International executive board had never been given consideration by the officers of District 14.

"After a four days' hearing, with thirty men sitting on the International executive board, by unanimous vote they held that the mines were idle in violation of contract, that they should be put to work, and that the grievances should be taken up and adjusted in conformity with the provisions of the contract. Further, the International executive board offered to the officers of District No. 14 the full influence and co-operation of the International Union in securing an equitable adjustment based upon the rights of our people under the contract.

"The decision of the board was not complied with by the officers of District No. 14 and that made the second trial that has been had upon that matter. That decision was rendered some time in advance of the convening of the International convention in September, and, feeling that if a convention had an opportunity to pass upon the question with a full and free discussion from all parties at interest it might have a helpful effect upon the officers of District No. 14, the matter was brought up in the report of the president.

"You men were here and heard the Deane and Reliance controversy discussed; you know that representatives of District 14 were given the privilege of the floor. And when the convention decided that question I was of the opinion that surely the officers of District 14 would obey the ruling of the International convention.

ALEXANDER HOWAT FLANKED BY TWO SYMPATHIZERS
At the left is John Rolando and at the right is Joe Bresso

"The action of the convention was but a few hours old when there appeared in the daily newspapers of the country an interview saying that the action of the convention would make no difference to the Kansas officers; that they proposed to continue their policy and that they would no longer regard the International organization's ruling as being binding upon them.

"Now at this time, after practically five months, we find that an appeal to this convention was taken only yesterday. Yes, filed now with the intention of securing a possible consideration under dramatic and sensational circumstances when men will not give due consideration to the facts.

"But the aggrieved parties had time to file an appeal in the Circuit Court of Missouri for an injunction against the United Mine Workers of America, and this in violation of the section that provides that a man who goes into the civil courts before exhausting his right of action under our own law will forfeit his membership.

"If in those legal proceedings they had won, do you think they would be in here asking for an appeal today? No, they would be standing up on the housetops of Kansas proclaiming that victory was perched upon their banners.

"I think they made an error of judgment in selecting the court. If they had come to Indianapolis they could have secured the injunction in Judge Anderson's court. However, that is merely one of the errors. It is an error of judgment to enter this convention at this time, when the future of the United Mine Workers of America is at stake and when the eyes of the trade union movement of the country are looking forward to the industrial conflict that seems inevitable. Upon the eve of ordering an advance upon the enemy the army is now asked to halt and wash out its dirty linen, to stay the advance while the generals of the army undertake to demonstrate to their forces who is the greatest scoundrel. What a sight!"

Disastrous Defeat for Miners in Event of Strike, but Operators Are Over-Optimistic, Is Washington View

By Paul Wooton

Washington Correspondent of *Coal Age*

On paper it would seem that the United Mine Workers face a demoralizing defeat if they go on strike on April 1, but those who are following the situation closely in Washington point out that there is increasing evidence that various uncertain factors are likely to arise. It is by no means safe, they say, to take it for granted that the strike will not amount to much. They point to the strike of 1894, when the United Mine Workers had only 50,000 members. Nevertheless one of the greatest industrial disturbances in the history of the country revolved around that nucleus. There is a parallel in the present situation in that the switchmen and maintenance of way employees of the railroads are aggrieved and are ripe for participation, formally or by indirection, in this strike. It is admitted that there is much uncertainty as to how far the strike influence may penetrate into borderland and non-union territory.

This sentiment is not present among the operators. They are firmly convinced that the strike will not amount to much. They are sure the country will not feel it if the union mines are closed for two months. Their optimistic public expressions reflect their real views, as may be judged by what they say in private. It is evident that the country is taking the same view of the situation. Congress has shown little interest in the matter and many financial and commercial services are advising their customers that coal will be cheaper after this flurry has passed.

Few coal specialists in Washington share this view. They rather expect a serious situation to develop and fail to see the reasoning behind any advice against laying in as large supplies as can be carried reasonably. Even if the Interstate Commerce Commission authorizes a reduction of rates and if the miners go back to work at a lower rate of pay, it hardly is to be expected that it will reduce more than $1 per ton the price the consumer pays for coal. If stocks were increased to the maximum of the war period, which was 63,000,000 tons, as compared with 47,000,000 tons now in storage, it would only mean that the coal consumers of the nation had paid $16,000,000 for insurance against a general demoralization of industry with all its attendant disastrous ramifications.

Even if the strike threat should fizzle out, this $16,000,000 is insignificant when compared with the staggering price which England had to pay when wages in the coal industry were reduced from the war basis. Industrial paralysis extended over three months. There was one whole month that not a pound of pig iron was produced in England. There was a runaway market and the rationing of coal on a stricter basis than during the most critical period of the war. It is the opinion of officials with vision—men charged with the welfare of the whole people—that the accumulation of stocks of coal at this time practically will insure the country's ability to continue in the orderly course of its industrial way. If the consumer wants to be anything other than the innocent bystander who is hurt, he must assume some of the cost in meeting a situation of this kind. If he insists on gambling on the possibility that he can get by with his present stocks and buy his coal cheaper at a later date, he is contributing to the possibility of serious interference with the country's industrial activities.

It is particularly difficult to understand the attitude of the large consumer—frequently a man who thinks this is the time to tell labor "where to get off"—who is willing to speculate with his coal supply when that course enhances the chance of the strike's success. Economists in Washington are of the opinion that the United States is getting out cheaply in the readjustment of coal wages if it has no other cost than that represented by some surplus stocks of high-priced coal.

As was shown by the recent stock report, large consumers as a whole, and particularly the railroads and the public utilities, are storing coal. This policy was based on business reasons and was formulated by men well schooled in the buying of coal. It is hoped that consumers without buying organizations will follow the example being set by those who have given the matter careful study.

Eugene C. Hultman, Fuel Administrator for Massachusetts, has written to officials in Washington asking whether or not New England should lay in heavy additional stocks at this time. It is safe to predict that he will be advised along the lines reflected in the foregoing paragraphs.

The administration apparently believes that the thing to do at this juncture is to keep still. If any plans are being made they are not leaking out. There is reason to believe, however, that the Attorney-General will not hesitate to employ the injunction weapon, if the need for it should arise.

It is known that the administration is not impressed with the Kenyon proposal which has taken legislative form following his report on the West Virginia situation. On Capitol Hill no particular significance is attached to the Kenyon bill. It is regarded as being the logical rounding out of Senator Kenyon's activities in connection with the Mingo investigation. There can be no denying, however, that under present circumstances pressure behind the Kenyon bill could develop very quickly. As the strike looms nearer there is likely to be popular clamor for action. Also there are indications that the miners see possibilities in government interference in the situation. When these indications are taken into consideration, the Kenyon bill cannot be regarded as anything other than a sleeping volcano, likely to awaken even if its author may have retired from the Senate.

Says Continuance of Present Wages Would Mean Disaster to Southern Ohio Field

Adoption of the mining scale proposed by the United Mine Workers would mean economic disaster to, if not the entire elimination of, the coal mining fields of southern Ohio, according to W. D. McKinney. Among other things he says "The operators of southern Ohio have no control over the wage scale which they must pay. The public in the final analysis is the tribunal that must fix wages. Southern Ohio and the markets it serves form the gateway through which all of the coals of West Virginia, Kentucky and Tennessee must pass and the public takes its choice of the product of these fields in the passing and will not purchase coals mined in southern Ohio unless these coals meet the competitive situation.

"Our organization has pointed out at various times the abnormal losses in the coal production of southern Ohio under the present wage scale, which we understand is the same now proposed to be continued after April 1, 1922, by the United Mine Workers who in addition thereto have attached working conditions which will still further increase the labor cost.

"The coal production of the United States in 1921 was 75 per cent of the average for 1917, 1918, 1919 and 1920, which was a better record than most other industries made. Compared with 75 per cent for the country, production in the southern Ohio field was but 45 per cent of its average production for the same period.

"Southern Ohio operators cannot sell the product of miners in the open market under the present wage scale. The public will not pay the price, and the mines are idle."

Powder Company Reduces Prices

The Hercules Powder Co. announces a reduction of prices on high explosives, permissibles and "B" blasting powders. The new prices are effective as of Feb. 17.

Mining Company Issues Frank Statement on Miners' Wages and Working Conditions

THERE is nothing new or startling in the following statement from a coal company president to his employees, but it is a good sample of what coal operators can well state and restate to their union labor in the next few weeks:

"To the employees of The Kathleen Mine:

"There are two factors that must be taken into account when wage rates are mentioned: The rate of wage paid and the opportunity to secure a day's work. The comparison of wages paid shown on the reverse side speaks for itself.* The real question concerns the opportunity to earn the rate of wage paid.

"In 1921 the United States produced 407,000,000 tons of soft coal, or 10,000,000 tons less than was produced in 1910, although we had nearly 14,000,000 more people to use coal in 1921 than we had in 1910. What was the matter? Industrial stagnation. Idle men, factories and steel mills, closed, railroad-car, locomotive and repair shops shut down. There are as many railroad employees out of service today as there are men in the coal mines. On Dec. 31 there were 618,675 freight cars standing idle in the United States. This is our condition today and it will so remain until:

"1. The cost of producing all the nation's coal is reduced.

"2. The cost of transporting freight is reduced.

"3. The wages of building mechanics in the large cities is reduced.

"These are the three outstanding items that prevent the return of prosperity. When they are adjusted, living costs will come down and we will go ahead, and not until then. This suggests that with labor representing 72 per cent of the cost of coal, the remedy for high costs must be found in a lower mine wage scale; the railroads and their employees are now discussing a further reduction in wage scales and the Interstate Commerce Commission is conducting an extensive rate reduction hearing.

"Building mechanics in the cities will either accept lower wages or lose the benefit of their organizations, which will be supplanted by the open shop. This company does not seek to destroy the miners' union; we prefer a sound rational organization to dealing with a mob in matters of wages and work. We ask now that you study not only the statements given you from union sources but all the facts bearing on our industrial situation. We, with you, can mine coal, but unless some third party will consent to buy, use and pay for it, neither of us can work and, most of all, none of us here wish to go to the Southern, Southeastern and Western mines to work for a wage that might prove too low to feed, clothe and educate yourselves and your families. With sound reasoning and good teamwork we can keep Illinois markets for Illinois mines. Talk the matter over with your friends, not forgetting your wives and your mothers.

Very sincerely yours,
"UNION COLLIERY COMPANY,
"By Eugene McAuliffe,
"Jan. 30, 1922. President and General Manager,"

C. T. Starr Heads Chamber of Commerce Coal Bureau; Activity Planned

WITH the appointment of C. T. Starr as chief of its coal bureau, the Chamber of Commerce of the United States expects to increase its efforts to be helpful to all concerned in the coal trade.

Mr. Starr is a native of Chester, Pa. He was educated in the public schools of that city and received his technical education as a part of the course in the Military College at Chester. He is both a mining and civil engineer. Immediately following his graduation he devoted his entire time to civil engineering and was a member of the engineering staff on several important Pennsylvania railroad, electric line and public works developments. In April, 1901, he decided to devote his chief attention to coal mining and has been engaged actively in that industry since, with the exception of the time that he was in the military service. So that he might know the coal mining business from the ground up, he began his work as a laborer in mines in the Pocahontas fields. Later he joined the engineering staff of the Norfolk Coal & Coke Co. Afterward he served for a year as a superintendent for the White Oak Coal & Coke Co.

Mr. Starr's next experience was with the Lehigh Coal & Navigation Co., which he served successively as assistant mining engineer, assistant division superintendent, assistant mechanical superintendent, superintendent of preparation, and, finally, superintendent of the construction department.

In 1912 Mr. Starr was employed by the Treverton Colliery Co. at Shamokin, Pa., as general superintendent. He filled that position until he entered the military service in September, 1917. As major of engineers he assisted in the organization of the forestry and quarry regiments. He accompanied the 28th Engineers to France. On his discharge from the military service in 1919 he accepted the position of chief engineer for the Weston Dodson Co.

It is not Mr. Starr's intention to inaugurate any new studies but rather to attempt to popularize, as well as to induce those concerned to put into effect, some of the many helpful suggestions that have been made by various agencies which have studied the needs of the coal industry.

In Appeal to U. S. Supreme Court Howat Attacks Kansas Industrial Tribunal

TWELVE points of attack are leveled against the Kansas Court of Industrial Relations in the brief of Alexander Howat and other Kansas mine leaders in their appeal to the U. S. Supreme Court to set aside the decision of the Kansas Supreme Court, which sentenced the mine leaders to prison for contempt of court for failure to observe an anti-strike injunction of the Kansas Industrial Court. This case and another case brought by the Kansas coal miners' union against the constitutionality of the Kansas act will be argued in the Supreme Court Feb. 27.

The union contends that the act seeking to create the Court of Industrial Relations is arbitrary, oppressive, unreasonable and unjust discrimination, in violation of the Fourteenth Amendment; that it is a penal statute that is vague, indefinite and uncertain and an unlawful restraint on commerce; it commingles the function of the three great departments of the government; it contravenes the Clayton Act and the Lever Act; it empowers the Court of Industrial Relations to fix wages, hours and working conditions, take over and operate industries, and generally to install a system of state socialism, all in violation of due process.

The void sections of the act are so intermingled with other sections, the union alleges, as to cause the whole act to fall.

January Anthracite Shipments Exceed Those Of December by 212,131 Tons

SHIPMENTS of anthracite during January, 1922, were larger by 212,131 gross tons than during December, 1921, although the total January shipments were 892,485 tons less than in the corresponding month last year, due in part to the continued industrial depression. The January record of 4,848,053 gross tons shows less than 14 per cent decrease from the 1921 average and approximately 5 per cent increase over the final month of last year.

Shipments by originating carriers were as follows, in gross tons:

	January, 1922	January, 1921	December 1921
Philadelphia and Reading	1,052,872	1,172,873	985,262
Lehigh Valley	766,602	1,058,127	801,796
Jersey Central	542,558	470,704	532,597
Lackawanna	744,768	910,260	626,377
Delaware and Hudson	619,762	814,491	654,987
Pennsylvania	331,871	451,879	307,520
Erie	466,495	606,602	450,465
New York, Ontario and Western	101,779	156,564	107,107
Lehigh and New England	221,346	99,038	169,811
Total	4,848,053	5,740,538	4,635,922

WOMEN HAVE BEEN DRIVING men out of the coal mines, but we haven't heard of the ladies preventing men from working in diamond mines.—*Brooklyn Eagle.*

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*This table appeared in *Coal Age*, Jan. 5 p. 19.

Prepare for 6-Weeks Strike, Says Cushing; Predicts Panic Coal Prices

AT THEIR monthly dinner, Feb. 17, George Cushing told the purchasing agents of Detroit that they should buy enough coal to last during a strike of at least six weeks after April 1. They also were warned to get under contract for two or three years because panic prices are coming again as soon as business tries to become normal.

His view is that the impending strike is inevitable because the burdens of unionism have become intolerable. He prophesies a return of panic coal prices—"1920 all over again"—because the railways can't carry the coal and can't be improved in time to avoid inflation. "The railways are dead—killed by regulation," is the way he put it.

Describing the progress of the union toward the point where it invites war from the operators, Mr. Cushing named these successive steps:

(1) To make wages uniform at adjoining mines, and hence to make competition equal, the operators—years ago—encouraged the formation of a union.

(2) To strengthen the union, the operators—years ago—conceded the closed shop and undertook to collect the union's dues from the miners—granted the check-off.

(3) The miners used the check-off to raise funds in one union field with which to fight a wage battle in another union field.

(4) Wishing to perpetuate their monopoly of labor within a state, the miners—on the plea that it would save precious lives—persuaded several state Legislatures to pass a law saying that no man may work as a miner unless he has a certificate. The law provides that these certificates must be issued by union men only.

(5) Having a monopoly of labor granted by contract and reinforced by law, the miners knew that no strike breakers could be employed. Therefore they now strike periodically to enforce their demands.

(6) By demanding, periodically, increases in pay and getting them through strikes, the miners boast openly that they will cause ownership of mines to become unattractive to capital. At that time the mines will be turned over to the miners, who will work them on a co-operative basis.

(7) They seek national agreements because by striking the whole country on one day the demands will be granted more quickly.

(8) They seek nationalization because: "We can get an increase of 15c. a ton from a fuel administrator in fifteen minutes, whereas we have to fight the operators three weeks to get 3c. a ton.

"You and I know that there are issues to be decided which make a strike inevitable," Mr. Cushing said. "Therefore you men will soon see—unless someone performs a miracle or makes a monumental blunder—300,000 miners throw down their tools until a new wage contract is signed."

Concluding, Mr. Cushing said:

"I mention these things because I want you to know that we—speaking of official America—have decided that the railroads are hopelessly ruined by regulation. If choice must be made—and the day of choosing is not far distant—we will allow the country to drift into the economic doldrums before we will admit that, politically, we made any mistakes by carrying regulation too far.

"Applying all of this to your case, I mean to say: The railroads are dead beyond hope of immediate recovery. They are worse off now than they were two years ago, because they have not been maintained. Beginning at once, the business of the country—the tonnage—will begin rapidly to grow. In a very few months, it will have caught up with what it was in 1920. It will start toward what it should have been in 1921. It will try to catch up with its own actuarial prospects in 1925. Midway in that improvement the growth of the nation's business will stop because the railways will not be available to move what we can produce and sell.

"What that is going to mean to your business and ours seems perfectly obvious. Your factories were rebuilt in major part out of the war profits. They were extended. Our coal mines were multiplied and improved out of war profits. These business units are available and will want to work. The buying power of the people will soon be restored and they will want to buy. Everything will be set for an increase in tonnage, leaving, as customary, a recovery in price to follow more leisurely.

"Then, the railroad blockade will stop midway the growth in tonnage. You and I know what will happen. When we stop tonnage growth without satisfying the demand, prices will begin to rise as buyers begin to compete for what can get through the traffic blockade. We will exactly reverse every lesson of our economic history. It will be the beginning, all over again, of 1920."

New Kenyon Bill Proposes Mining Board To Settle Wages, Hours and Conditions

CARRYING out the recommendations embodied in his report on the West Virginia coal strike, Senator Kenyon, of Iowa, on Feb. 14 introduced in the Senate a bill providing for the settlement of disputes in the coal mining industry by a National Coal Mining Board, to be composed of nine members. The proposed board would have headquarters at Washington, its decisions would be based on a proposed industrial code recently enunciated by the Senator. The members of the board would be nominated and confirmed by the President and serve 5-year terms, three each to represent the coal miners, the operators and the public. The union and operators' representatives would be picked from six nominees suggested by the United Mine Workers and six suggested by the National Coal Association and the Anthracite Operators' Association.

In addition to providing for settlement of labor disputes along the lines followed by the present Railroad Labor Board in adjusting railroad difficulties, the bill would empower the board to investigate questions relating to wages, hours of labor and conditions and regularity of employment, and to institute measures to stabilize the industry and regularize employment. Coal-mining disputes would be taken up by the board on request of the union or operators or on petition of not less than 100 non-union miners or on the board's own motion, and the board would be required to render a decision in a dispute within 60 days after it assumes jurisdiction, unless extended by agreement of the parties.

The bill was referred to the Senate Labor Committee, of which Senator Kenyon is chairman, but it is hardly likely that the Senator will be able to obtain action on it before he retires to become a federal judge, which probably will be about the latter part of February.

Labor Department Report Blames Union for Distress in West Virginia Coal Fields

UNIONISM is the cause of troubles, unemployment and family distress in the West Virginia coal fields, according to the report of the Department of Labor conciliators to Secretary Davis, transmitted to the President. The investigation followed recent reports by union leaders of suffering among the miners and their families. No recommendation is made for government assistance, it being stated that conditions will unravel themselves within a month or 60 days.

"The question of the open shop is the crux of the West Virginia conditions," the report says. "Owing to the dullness of the coal market many men are out of work. As a result of no work there are some cases of poverty and a few cases of destitution. Careful investigation revealed no cases of starvation. No evictions of miners' families have been forced by the mine owners. Some notices were given verbally or orally to families that they would have to move, however, and as a result of these notices 110 families gave up possession of their homes. The companies assured the investigators that there would be no evictions that would impose hardships, although eventually all of their houses would be needed for men working in the mines." Charity is relieving cases requiring need. Many of the miners have resumed work under the 1917 wage scale.

Thick Vein Freeport Operators Announce Wage Reduction of 34 Per Cent for April 1

WALTER L. CALVERLEY, president of the Union Collieries Co. and chairman of the wage-scale committee on the Thick Vein Freeport Coal Operators Association, recently announced that, effective April 1, the wage scale paid in the mines operated by that association would be reduced an average of 34 per cent. The scale will be as follows:

Contract Rates Per Ton of 2,000 Lb., Mine-Run:	
Pick mining in rooms, entries and stumps where pillars are drawn by machine	$0.65
Pick mining in solid pillar work	0.58
Cutting in wide or narrow work	0.071
Loading in wide or narrow work	0.446
Yardage Rates:	
Cutting, entry rates	0.1642
Loading, entry, single shift	0.3960
Loading, entry, double shift	0.5120
Day Wages per 8-Hour Day:	
Motormen	4.60
Motormen's helpers, skilled wiremen, tracklayers, bottom cagers, drivers, trip riders, water haulers, timbermen, shotfirers, skilled pipemen, bratticemen, skilled workmen	4.50
Bottom cagers' helpers, pumpers (except where agreement to pay by the month is in effect)	4.30
Wiremen helpers, tracklayers' helpers, timbermen's helpers, pipemen helpers	4.25
Firemen	4.10
All unspecified inside common labor and dumpers	3.60
Trimmers	3.50
Minimum outside day labor and pushers	3.25
Trappers	2.00

All unspecified dead work, 30 per cent reduction from 1921 scale.

Mr. Calverley stated that as federal Judge Anderson had declared the check-off illegal the association did not consider it necessary to take it under advisement.

Local Wage Scales Predicted for Northern West Virginia and Upper Potomac Fields

FOLLOWING the announcement made a few days ago by the Monongahela Coal Association that there would be a reduction in wages at the 65 or more mines represented in the association, on Feb. 8 notices were posted at the various mines on Scotts Run carrying into effect the announcement and conveying the information that the adjustment would amount to a reduction of from 31 to 54 per cent as compared with the present scale of wages paid. Members of the Monongahela Valley Association are the first to take any action in concert in northern West Virginia, but other associations in the northern part of the state are expected to follow suit between now and April 1 and it is not believed that there will be any effort to hold any conference with the United Mine Workers looking to a new scale.

Although no agreement has been reached between the United Mine Workers and the operators in the Upper Potomac field and although it is doubtful if any such agreement will be reached, the belief is generally entertained that there will be an agreement between the various mine owners in this region and the miners, acting independently of the union, on a scale which will permit the mines or many of them to resume operations, this belief being based on the fact that the union has never been as strongly intrenched in the Upper Potomac territory as in other union fields.

Asks Congress to Probe Coal Mining

A GENERAL investigation of the coal-mining industry is proposed in a resolution introduced in the House of Representatives by Representative Robsion, of Kentucky. He seeks remedial legislation for the present paralyzed condition of the industry and the collapse of the export coal trade. His resolution directs the House Mines and Mining Committee or a subcommittee thereof to investigate the "conditions prevailing in the coal mining industries of the United States, with particular reference to the paralysis of this industry, the cause of Great Britain being able to ship her coal to the United States and the destruction of the export coal trade of the United States; also with particular reference to the state of unemployment in said industry, destitution among miners in this industry, and the condition of the workers in the said industry, and to recommend remedial legislation based upon such investigation.

THE PLACE AT WHICH the annual convention of the National Coal Association will be held will be decided at a meeting of the association's directors to be held in Washington March 2. It is improbable that the date of the convention will be fixed at this meeting of the directors, due to the uncertainties as to the labor situation. It is not probable that the convention would be held with a strike in progress.

UTAH HAD 3,725 COAL-MINE OPERATIVES when the 1920 census was taken. This compares with 2,318 in 1910.

Wage Scale in Ten Competing Districts with Nine Average and Compared With Present and 1916 Hocking Scale

(CONTRIBUTED BY GEORGE M. JONES CO.)

	Hazard No. 4	Hazard No. 7	Elkhorn	Harlan	North-eastern Kentucky	Southern Appalachian	Pocahontas	Tug River	Thacker	New River	Average	Hocking Present	Hocking 1916
Mining rates, per ton:													
Pick mining, run-of-mine	.....	.....	.....	$0.61	$0.55	.....	.....	.....	.....	.....	.....	$1.1164	$0.6764
Machine cutting in rooms	$0.17	$0.11	$0.06	0.12	0.12	.....	.....	.....	.....	$0.1071	$0.1145	0.14	0.0740
Machine cutting in entries	0.17	0.11	0.07	0.13	0.12	.....	.....	.....	.....	0.1071	0.1178	0.1790	0.1024
Loading in rooms	0.60	0.50	0.45	0.49	0.45	.....	.....	.....	.....	0.4732	0.4940	0.80	0.4260
Loading in entries	0.60	0.52	0.48	0.54	0.45	.....	.....	.....	.....	0.4732	0.51	0.9290	0.5194
Inside day labor, per hour:													
Tracklayers	0.56		0.555	0.60	0.58	$0.48	$0.55	$0.55	$0.55	0.57	0.55½	0.9375	0.372
Tracklayers' helpers	0.48		0.475	0.43	0.45	0.43	0.35	0.35	0.37½	0.52	0.43	0.906	0.344
Trappers, boys	0.288		.....	0.25	0.35	0.25	0.25	0.35	.....	0.33	0.32	[illegible]	0.175
Trappers, old men	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	0.675	0.20
Bottom cagers, drivers, trip riders	0.511		0.525	0.43	0.54	0.43	0.50	0.45	0.50	0.53½	0.49	0.9375	0.372
Snappers on gathering locomotives	0.511		0.523	[illegible]	0.54	0.43	0.60	0.45	0.50	0.53½	0.51	0.9375	0.372
Water haulers, machine haulers	0.40		0.475	0.40	0.35	0.40	0.35	0.35	0.37½	0.51	0.40	0.9375	0.372
Timbermen	0.56		0.545	0.60	[illegible]	0.48	0.55	0.45	0.50	0.51	0.53	0.9375	0.372
Pipemen for compressed air plants	0.48		0.545	0.43	[illegible]	0.43	0.55	0.45	0.50	0.58½	0.50½	0.93	0.365
Wiremen	0.56		0.545	0.43	0.58	0.43	0.55	0.45	0.50	0.58½	0.51	0.9375	0.372
Motormen	0.56		0.555	0.60	0.58	0.50	0.50	0.50	0.55	0.58½	0.55	0.9375	0.372
Other inside labor, unclassified	0.40		0.475	0.40	0.35	0.40	0.35	0.35	0.37½	0.51	0.40	0.906	0.344
Outside day labor, per hour:													
First blacksmith	0.64		0.605	0.60	0.65	0.50	0.60	0.50	0.57	0.62½	0.59	0.97	0.41
Second blacksmith	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	0.93	0.37
Blacksmith, helpers	0.448		0.515	0.45	0.40	0.45	.....	.....	.....	0.54	0.46½	0.906	0.344
Carpenters	0.52		0.555	0.48	0.45	0.48	0.55	0.45	0.44	0.57	[illegible]	0.93	0.37
Dumpers and trimmers	0.48		0.515	0.48	0.40	0.40	0.40	0.40	0.40	0.52	0.44	0.906	0.344
Greasers and couplers	0.28		0.465	0.33	0.35	0.33	0.25	0.35	0.25	0.31	0.32½	0.6325	0.265

The Upper Potomac Coal Association refuses to recognize any scale for that district. The Virginia Coal Operator's Association has no working scale, operators making their own scale adjustments. Logan County, West Virginia has no recognized scale, each operator being free to act in scale adjustments.

Production and the Market

Weekly Review

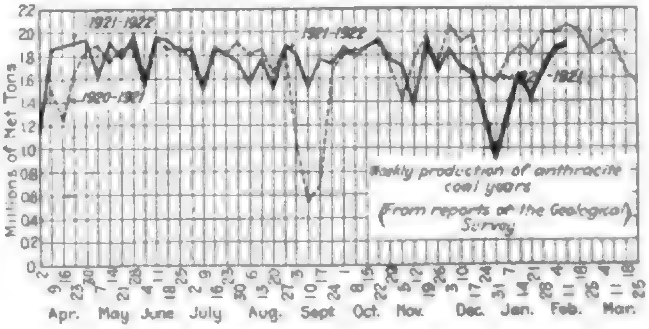
CAUTION and conservation seem to be the guiding influence of the coal buyer lately. The majority of consumers are waiting for clearer indications of the strike emergency before stocking up too heavily. although buying is heavier, the market lacks the snap that characterized it earlier in the month. Business now being done is on a more hesitant basis, as the prospect of a lower delivered price after the wage controversy is settled is too attractive an outlook for the rank and file of buyers to lay in the reserves that the trade is urging upon them.

SMALLER CONSUMERS RELUCTANT TO STOCK

The major portion of the increasing production is going to the storage piles of railroads and utilities. Smaller consumers are deterred by the developments of the miners' convention from following a like policy. A strike may be short lived, but the idea of taking steps to adequately protect fuel supply is a wise policy. Even though pre-strike prices are likely to be reduced, the difference in cost—which may be termed fuel insurance—is not likely to be heavy; is inconsequential in fact compared with the industrial losses which would be incurred by a long and demoralizing interruption of operations because of a lack of fuel.

Quotations are showing no great tendency to increase. The supply of available coal is still equal to all demands and there is not the slightest sign of a scarcity. Non-union operators point to their portion of the present spot tonnage moving as an indication of their ability to supply the needs of the market in the event of a union shutdown. *Coal Age* index of spot bituminous coal prices stands at 182 for the week ended Feb. 20, as compared with 183 for the previous week.

Good coal-burning weather has enlivened the retail anthracite trade. Dealers' stocks were entirely adequate to care for this increased business and they are reordering very cautiously. Mines are still unable to obtain much forward business and there has been a further softening of domestic quotations. Demand for steam sizes is still good, but heavier production has halted the upward trend of independent quotations.



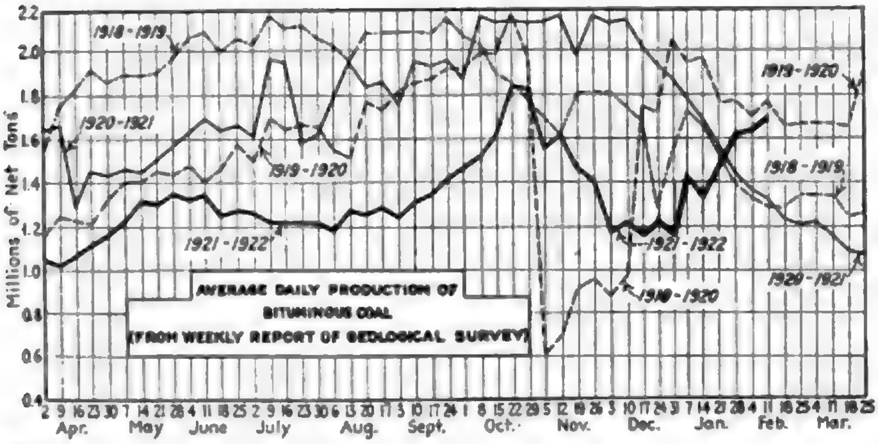
BITUMINOUS

Production of soft coal during the week ended Feb. 11 was 10,326,000 net tons, according to the Geological Survey. This is an increase of 620,000 tons over the preceding week's figure and the highest of the coal year with the exception of last October, when an impetus was felt, due to the threatened railroad strike. The present production rate is sufficient to allow considerable tonnage to flow into reserve. A further increase in output is presaged by early reports of loadings last week.

All-rail movement to New England showed a further increase during the week ended Feb. 11. Shipments were 3,678 cars, as compared with 3,531 cars the week preceding. Railroads are taking more tonnage but the spot market is greatly restricted by the activities of Hampton Roads shippers.

Dumpings for all accounts at Hampton Roads were 295,925 net tons during the week ended Feb. 16, an increase of 40,000 tons from the week before. Bunkers and coastwise tonnage are heavier but the export market stagnation still continues. Accumulations at the piers are increasing, as shippers are anticipating better demands as the strike period nears.

Middle Western markets have shown more activity. Much of the enormous tonnage passing through the Cincinnati gateway has been destined for Chicago, where disposition



Estimates of Production

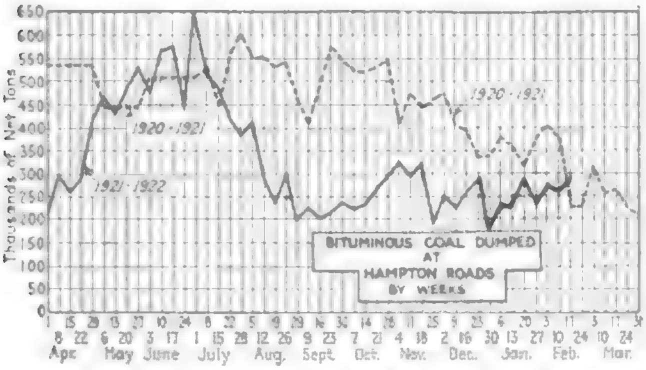
(Net Tons)

BITUMINOUS COAL

	1921—1922	1920—1921
Jan. 28 (*b*)	9,615,000	8,570,000
Feb. 4 (*b*)	9,706,000	8,132,000
Feb. 11 (*a*)	10,326,000	7,859,000
Daily average	1,721,000	1,310,000
Coal year	360,759,000	474,440,000
Daily av. coal yr.	1,358,000	1,779,000
ANTHRACITE		
Feb. 4	1,811,000	1,985,000
Feb. 11 (*a*)	1,822,000	2,048,000
Coal year	74,270,000	77,948,000
COKE		
	1922	1921
Feb. 4	122,000	234,000
Feb. 11 (*a*)	128,000	228,000
Calendar year	705,000	1,505,000

(*a*) Subject to revision. (*b*) Revised from last year.

has been made at low figures. To meet this non-union competition and to induce stocking of retail coal, southern Illinois operators have reduced their domestic prices. Steam coals are in good position and quotations show an upward tendency. Many producers are sold up on steam sizes to April 1 and non-union sources of supply are being investigated.



North Atlantic line business is holding fairly well, but Eastern centers report a relaxation in the amount of tonnage closed. Much coal is on the way on consignment and some distress tonnage is likely unless the buying spurt is resumed shortly. In the Northwest the docks are making strenuous efforts to reduce their inevitable carryover, but, aside from a domestic spurt caused by wintry weather, are moving only a slightly increased tonnage.

The number of freight cars idle because of business conditions totaled 467,997 on Feb. 8, compared with 489,842 on Jan. 31, a reduction of 21,845 cars. Of this total, 171,338 represented the number of idle freight cars in need of repairs in excess of the number normally regarded as being in bad order. Surplus coal cars numbered 123,119, or a reduction of 22,794 within the same period.

ANTHRACITE

Production of anthracite continued to increase in the second week of February. The output was 1,822,000 net tons, as compared with 1,811,000 in the week preceding. The better production was made possible by a cold weather spurt in the retail trade, although household buying is still on a hand-to-mouth basis. Retailers are not reordering heavily and April 1 will see stocks at the minimum. Independent quotations are softening, as it is becoming difficult to find a market for all domestic sizes. Steam prices, which have had an upward trend, have been halted, as the increased output has eased the scarcity of steam sizes. However, these coals continue in good demand.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

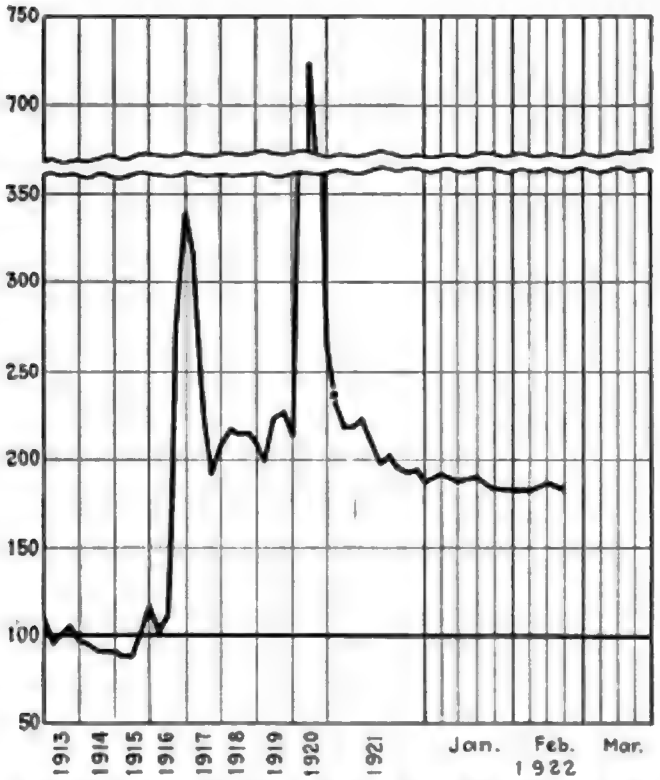
Low-Volatile, Eastern	Market Quoted	Jan. 23 1922	Feb. 6 1922	Feb. 13 1922	Feb. 20 1922†
Pocahontas lump	Columbus	$3.30	$3.25	$3.35	*$3.15@ $3.50*
Pocahontas mine run	Columbus	2.15	2.15	1.90	**2.00@ 2.25**
Pocahontas screenings	Columbus	1.50	1.30	1.40	**1.40@ 1.65**
Pocahontas lump	Chicago	2.85	3.00	3.15	2.75@ 3.50
Pocahontas mine run	Chicago	2.15	2.00	2.25	*1.75@ 2.50*
Pocahontas lump	Cincinnati	2.85	3.15	3.15	3.00@ 3.25
Pocahontas mine run	Cincinnati	1.90	1.85	1.85	*1.75*
Pocahontas screenings	Cincinnati	1.40	1.20	1.15	1.00@ 1.25
*Smokeless mine run	Boston	4.70	4.70	4.80	*4.60@ 4.65*
Clearfield mine run	Boston	1.95	1.95	1.95	1.70@ 2.25
Cambria mine run	Boston	2.45	2.45	2.45	2.25@ 2.60
Somerset mine run	Boston	1.80	1.90	1.90	1.75@ 2.00
Pool 1 (Navy Standard)	New York	3.20	2.85	3.00	2.75@ 3.25
Pool 1 (Navy Standard)	Philadelphia	3.00	3.05	3.00	2.85@ 3.25
Pool 1 (Navy Standard)	Baltimore	2.40	2.55	2.60	*2.50@ 2.60*
Pool 9 (Super. Low Vol.)	New York	2.25	2.35	2.45	**2.20@ 2.75**
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	2.40	2.45	2.20@ 2.65
Pool 9 (Super. Low Vol.)	Baltimore	2.10	2.20	2.30	*2.15@ 2.35*
Pool 10 (H. Gr. Low Vol.)	New York	2.10	2.05	2.10	1.90@ 2.25
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.00	2.10	2.10	1.95@ 2.20
Pool 10 (H. Gr. Low Vol.)	Baltimore	1.95	2.00	2.05	2.05
Pool 11 (Low Vol.)	New York	1.70	1.75	1.75	1.65@ 1.90
Pool 11 (Low Vol.)	Philadelphia	1.70	1.75	1.75	1.65@ 1.85
Pool 11 (Low Vol.)	Baltimore	1.70	1.85	1.75	1.75
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.45	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)	Philadelphia	1.55	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)	Baltimore	1.40	1.45	1.40	1.35@ 1.50
Pittsburgh sc'd. gas	Pittsburgh	2.65	2.65	2.65	2.60@ 2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@ 2.20
Pittsburgh slack (Gas)	Pittsburgh	1.75	1.65	1.65	1.60@ 1.70
Kanawha lump	Columbus	2.60	2.65	2.65	2.50@ 2.80
Kanawha mine run	Columbus	1.65	1.65	1.65	1.50@ 1.85
Kanawha screenings	Columbus	1.15	1.30	1.35	*1.20@ 1.40*
W. Va. Splint lump	Cincinnati	2.50	2.55	2.65	*2.25@ 2.50*
W. Va. Gas lump	Cincinnati	....	2.25	2.00	**2.05@ 2.25**
W. Va. mine run	Cincinnati	1.40	1.45	1.60	*1.35@ 1.65*
W. Va. screenings	Cincinnati	1.10	1.10	1.30	*1.10@ 1.35*
Hocking lump	Columbus	2.60	2.65	2.75	*2.50@ 2.80*
Hocking mine run	Columbus	1.90	1.75	1.90	1.75@ 2.00
Hocking screenings	Columbus	$1.20	$1.35	$1.35	*$1.25@$1.40*
Pitts. No. 8 lump	Cleveland	3.00	3.00	3.10	3.00@ 3.25
Pitts. No. 8 mine run	Cleveland	1.90	2.00	1.95	1.95@ 2.00
Pitts. No. 8 screenings	Cleveland	1.65	1.70	1.65	1.60@ 1.70
Midwest					
Franklin, Ill. lump	Chicago	3.65	3.65	3.65	*3.00@ 3.65*
Franklin, Ill. mine run	Chicago	2.35	2.35	2.50	2.25@ 2.75
Franklin, Ill. screenings	Chicago	2.05	2.00	1.95	**1.75@ 2.25**
Central, Ill. lump	Chicago	3.00	3.00	3.00	2.75@ 3.25
Central, Ill. mine run	Chicago	2.35	2.35	2.35	2.25@ 2.50
Central, Ill. screenings	Chicago	1.70	1.65	1.75	**1.70@ 1.90**
Ind. 4th Vein lump	Chicago	3.25	3.25	3.25	3.00@ 3.50
Ind. 4th Vein mine run	Chicago	2.55	2.50	2.50	2.35@ 2.65
Ind. 4th Vein screenings	Chicago	1.85	1.85	1.90	**1.85@ 2.10**
Ind. 5th Vein lump	Chicago	2.95	2.95	2.80	**2.60@ 2.75**
Ind. 5th Vein mine run	Chicago	2.20	2.25	2.25	2.10@ 2.40
Ind. 5th Vein screenings	Chicago	1.65	1.55	1.65	**1.65@ 1.85**
Standard lump	St. Louis	2.75	2.90	2.90	*2.50@ 3.00*
Standard mine run	St. Louis	1.95	1.90	1.90	**1.85@ 2.00**
Standard screenings	St. Louis	1.35	1.00	1.05	**1.10@ 1.25**
West. Ky. lump	Louisville	2.55	2.60	2.55	*2.25@ 2.75*
West. Ky. mine run	Louisville	1.80	1.90	1.85	1.70@ 2.00
West Ky. screenings	Louisville	1.05	1.15	1.25	**1.15@ 1.50**
South and Southwest					
Big Seam lump	Birmingham	2.75	2.90	2.90	2.75@ 3.00
Big Seam mine run	Birmingham	2.10	1.85	1.85	1.75@ 2.00
Big Seam (washed)	Birmingham	2.15	2.10	2.10	2.00@ 2.25
S. E. Ky. lump	Louisville	2.70	2.90	2.75	*2.50@ 2.75*
S. E. Ky. mine run	Louisville	1.55	1.45	1.65	*1.50@ 1.65*
S. E. Ky. screenings	Louisville	1.25	1.15	1.15	**1.10@ 1.30**
S. E. Ky. lump	Cincinnati	2.65	2.90	2.65	*2.25@ 2.75*
S. E. Ky. mine run	Cincinnati	1.45	1.45	1.65	*1.45@ 1.60*
S. E. Ky. screenings	Cincinnati	1.05	0.85	1.05	**1.00@ 1.20**
Kansas lump	Kansas City	4.75	5.00	5.00	5.00
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Feb. 6, 1922		Feb. 13, 1922		Feb. 20, 1922†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.00@$7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.85	$7.00@ 7.50	7.75@ 7.85
Egg	New York	2.61	7.50@ 7.75	7.60@ 7.75	7.50@ 7.75	7.60@ 7.75	*7.25@ 7.75*	7.60@ 7.75
Egg	Philadelphia	2.66	7.15@ 7.75	7.75	7.15@ 7.75	7.75	7.15@ 7.75	7.75
Egg	Chicago	5.63	7.50*	6.95*	7.50*	7.40*	7.50*	7.40*
Stove	New York	2.61	7.85@ 8.10	7.90@ 8.10	7.85@ 8.10	7.90@ 8.10	*7.75@ 8.10*	7.90@ 8.10
Stove	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25
Stove	Chicago	5.63	7.75*	7.20*	7.75*	7.60*	7.75*	7.60*
Chestnut	New York	2.61	7.85@ 8.10	7.90@ 8.10	7.85@ 8.10	7.90@ 8.10	7.85@ 8.10	7.90@ 8.10
Chestnut	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25
Chestnut	Chicago	5.63	7.75*	7.20*	7.75*	7.60*	7.75*	7.60*
Pea	New York	2.47	5.00@ 5.75	6.05@ 6.45	5.00@ 5.50	5.75@ 6.50	5.00@ 5.50	5.75@ 6.50
Pea	Philadelphia	2.38	4.75@ 5.00	6.15@ 6.25	4.75@ 5.00	6.15@ 6.25	4.75@ 5.00	6.15@ 6.25
Pea	Chicago	5.63	6.10*	5.60*	6.10*	6.10*	6.10*	6.10*
Buckwheat No. 1	New York	2.47	3.00@ 3.50	3.50	3.00@ 3.50	3.50	*3.00@ 3.50*	3.50
Buckwheat No. 1	Philadelphia	2.38	2.50@ 3.25	3.50	2.75@ 3.25	3.50	**2.75@ 3.50**	3.50
Rice	New York	2.47	2.00@ 2.50	2.50	2.00@ 2.50	2.50	2.00@ 2.50	2.50
Rice	Philadelphia	2.38	1.75@ 2.25	2.50	1.75@ 2.25	2.50	**2.00@ 2.25**	2.50
Barley	New York	2.47	1.50@ 1.75	1.50	1.50@ 1.75	1.50	1.50@ 1.75	1.50
Barley	Philadelphia	2.38	1.00@ 1.50	1.50	1.00@ 1.75	1.50	**1.25@ 1.75**	1.50
Birdseye	New York	2.47	....	2.50	....	2.00@ 2.50	....	2.00@ 2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type, declines in italics.



Coal Age Index, 182, Week of Feb. 20, 1922. Average spot price for same period, $2.20. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

COKE

Beehive coke production was 128,000 net tons in the week ended Feb. 11, an increase of 6,000 tons over the previous week. Connellsville operators report a peculiar situation; there is no demand for coal even in the face of a strike, while the coke market is active and the call is increasing. Prices have stiffened all around.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE (a)

(Net Tons)

	Byproduct	Beehive	Total
January	2,278,000	1,137,000	3,415,000
February	1,888,000	865,000	2,753,000
March	1,772,000	575,000	2,347,000
April	1,519,000	328,000	1,847,000
May	1,590,000	300,000	1,890,000
June	1,408,000	232,000	1,640,000
July	1,297,000	180,000	1,477,000
August	1,383,000	248,000	1,631,000
September	1,423,000	289,000	1,712,000
October	1,734,000	416,000	2,150,000
November	1,766,000	477,000	2,243,000
December	1,860,000	514,000	2,374,000
Total 1921	19,918,000	5,561,000	25,479,000
Monthly average	1,660,000	463,000	2,123,000
January, 1922	1,903,000	496,000	2,399,000

(a) Excludes screenings and breese.

To make the coke produced in January it is est mated that 3,517,000 tons of coal were used, little more than half of what is required when business is most active.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE.

(Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 monthly average	2,625,000	4,354,000	6,979,000
1918 monthly average	3,072,000	4,014,000	7,086,000
1919 monthly average	2,988,000	2,478,000	5,466,000
1920 monthly average	3,684,000	2,665,000	6,349,000
1921 monthly average	2,385,000a	731,000a	3,116,000
October, 1921	2,491,000a	656,000a	3,147,000
November, 1921	2,538,000a	752,000a	3,290,000
December, 1921	2,672,000a	811,000a	3,483,000
January, 1922	2,735,000a	782,000a	3,517,000

(a) Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in byproduct ovens, and 63.4 per cent in beehive ovens.

Foreign Market And Export News

ITALY—Cardiff steam first is quoted at 38s. 9d. on the Genoa market, according to a cable to *Coal Age*. This is a continuation of the increase noted last week, when a price of 38s. was reported.

BELGIUM—The coal market is suffering from a feeling of uneasiness though prices are unchanged. Prices for coke, on the other hand, are firm as the result of heavy demands from France and Luxemburg. Moreover production cannot keep pace with demand.

SPAIN—Resumption of work in the Asturian coal mines has been accompanied by a revival of activity in the coal market. Quotations at the pit-head are: Screened, 62 pesetas, large, 59, small gas, 35 and small steam 33. The problem of the future customs duties on coal is causing the government much anxiety. Coalowners are demanding duties which shall compensate for the difference in price between Spanish and foreign coal. At the request of the Associations of León and Palencia the government has granted on all coal or coke despatched by sea the bounty of five pesetas allotted primarily to the Asturian product.

INDIA—The Indian Mining Federation has advocated before the Fiscal Commission the imposition of an import duty on Rs. 5 per ton on coal in order to protect Indian coal against Welsh, Japanese and Natal coals. The coal market is steady. The supply of Bengal coal is inadequate owing to railway difficulties. The rates are: Bengal 1st Rs. 35 per ton; Bengal Good 2nd Rs. 29/8; Bengal 2nd Rs. 27; English coal Rs. 38.

Export Clearances, Week Ended, Feb. 16, 1922

FROM HAMPTON ROADS:

For Canada:	Tons
Dan. S.S. Skanderborg, for St. Johns, N. B.	2,583
Am. S.S. Carib, for Bridgetown, N. S.	2,193
For Cuba:	
Br. Schr. W. N. Reinhardt, for Santo Domingo	425
Dan. S.S. Maersk, for Nuevitas	1,978

FROM PHILADELPHIA:

For Brazil:	
S.S. Otho, for Rosario	
For Cuba:	
Dan. S.S. Olaf L. Kongstad, for Havana	
Br. S.S. Finchley, for Havana	

Amount and Value of British Coal Exports, December and Calendar Year of 1913, 1920 and 1921

	December					
	Quantity (Gross Tons)			Value		
	1913	1920	1921	1913	1920	1921
Anthracite	249,496	168,919	221,879	£196,573	£693,140	£525,545
Steam	4,588,444	1,765,959	3,188,391	3,232,360	7,264,081	3,711,596
Gas	980,548	292,991	675,593	637,705	1,101,479	862,403
Household	134,384	10,124	56,615	89,525	47,730	74,437
Other sorts	276,581	64,083	167,684	173,104	238,259	191,980
Total	6,229,453	2,302,076	4,309,162	£4,329,267	£9,344,689	£5,365,961

	Calendar Year					
	Quantity (Gross Tons)			Value		
	1913	1920	1921	1913	1920	1921
Anthracite	2,976,389	1,641,190	1,463,668	£2,374,353	£5,400,251	£3,718,767
Steam	53,618,922	20,137,411	18,372,185	37,845,546	82,194,605	30,789,029
Gas	11,527,686	2,204,571	3,740,744	7,154,427	8,682,503	6,795,552
Household	1,769,719	76,059	228,246	1,164,088	235,082	374,448
Other sorts	3,507,402	872,622	855,709	2,188,838	3,114,705	1,273,795
Total	73,400,118	24,931,853	24,660,552	£50,727,252	£99,627,146	£42,951,591

British Prices Stiffen with Heavier Export Demand; Production Continues Good

British production during the week ended Feb. 4, 1922, was 4,803,000 gross tons, according to a cable to *Coal Age*, as compared with 4,739,000 tons in the previous week.

Exports for January were 4,021,000 tons, a substantial increase, when compared with January of a year ago, but about 300,000 tons less than the figure for December, 1921.

South Wales activities are increasing. Inquiries for contracts over twelve months are heard and prices are stiffening. The East Coast market is active and advancing. February is sold up, but so far there is little offering for March.

Quite a number of inquiries continue to come into the Newcastle coal market, where a greatly improved tone is evident. Observers are confident that the worst is now over and that a period of comparative prosperity is ahead.

Inquiries in this district are for gas coals for the Gothenburg gas works, the Bordeaux gas works, the Aarhuus gas works and the Svendborg gas works. The Gothenburg and Aarhuus plants are each asking for 6,000 tons of best Durham during the next two months, and the Svendborg, 2,000 tons of the same variety. The French railroads are in the market for large supplies of coking coals.

Employment in north England is good but influenza has rendered a considerable proportion of miners idle. In Scotland the industry is very active. A feature has been the much improved demand for industrial coals of all kinds for home consumption. The miners are working with a will and are exhibiting far more energy than has been apparent for over a year.

Increased Prices for German Coal

A general increase in coal prices has been decided upon by the Reichs-Kohlenverband and the grand committee of the Reichskohlenrat. The increase on hard coal in the principal basins is 50 to 61 marks per ton and on lignite coal 10.80 to 15 marks per ton, not including tax.

In a statement issued by the management of the Berlin Municipal Gas Works and bearing upon the advantages and disadvantages of the import of British coal, attention is called to the fact that imports would render the increase of Berlin gas prices necessary. German coal is quoted at 635 marks including coal taxes, f.o.b. Berlin, while the corresponding price of British coal is 1,370 marks. If there were any guaranty, the statement proceeds, that the quality of British coal were still the same as before the war, this difference would constitute a less weighty factor inasmuch as gas works are being supplied with large quantities of German coal wholly unsuited for gas production. Unfortunately, British coal of pre-war quality is unobtainable.

French Coal Imports in November, 1921

	Tons
Coal	
Great Britain	1,064,082
Belgium	254,942
United States	12,362
Germany	512,187
Sarre	1,575,653
Other countries	40,931
Total	3,460,157
Coke	
Belgium	14,478
Great Britain	3,276
Germany	309,578
Other countries	430
Total	327,762
Briquets	
Great Britain	17,508
Belgium	70,715
Germany	37,807
Other countries	57
Total	126,087

Hampton Roads Pier Situation

	Week Ended Feb. 9	Week Ended Feb. 16
N. W. Piers, Lamberts Point:		
Cars on hand	2,760	2,400
Tons on hand	155,953	140,000
Tons dumped	92,576	137,894
Tonnage waiting	16,450	7,090
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,452	1,517
Tons on hand	72,600	76,850
Tons dumped	72,655	75,090
Tonnage waiting	4,473	7,660
C. & O. Piers, Newport News:		
Cars on hand	1,371	1,499
Tons on hand	68,550	74,950
Tons dumped	61,714	51,735
Tonnage waiting	175	.....

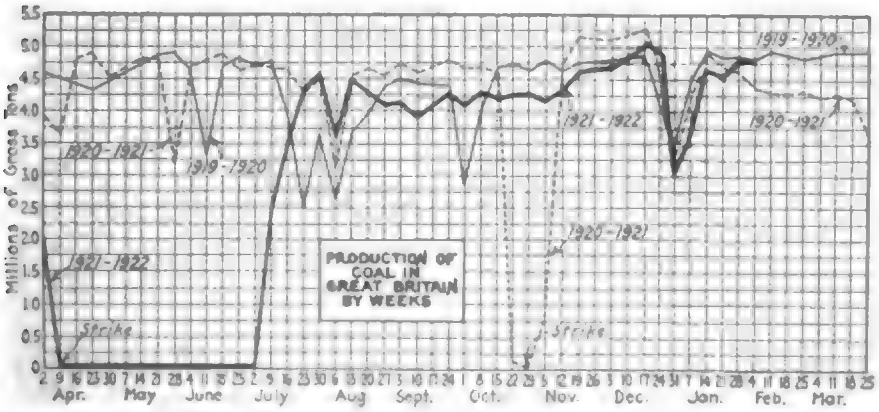
Hampton Roads Accumulation Increases

Business was comparatively dull last week with shipments to West Indies and New England still moving but at only a moderate rate. Bunkers were in fair demand, and prices were soft on all grades.

Accumulations were increasing, dealers laying in extra supplies in anticipation of mine strike troubles in other parts of the country. Dumpings for the week, also, were slightly in excess of the week before.

Discontinuance of the Lambert's Point Coal Exchange had no effect on the handling of coal, and dumpings at the N. & W. piers continued to lead in volume.

Evidence of increased business in anticipation was seen in the fact that several concerns here have extended their service, while two new concerns during the week have opened branch offices at this port.



Destination of British Coal Exports, December, 1913, 1920, and 1921

Country	Gross Tons, December Quantity, 1913 Tons	1920 Tons	1921 Tons
Russia	400,315	10,314	12,448
Sweden	379,522	80,582	233,390
Norway	201,951	54,505	147,945
Denmark	294,685	86,462	307,685
Germany	655,841	11,062	158,377
Netherlands	148,598	63,696	371,357
Belgium	140,761	21,164	204,717
France	1,099,553	1,072,515	1,233,993
Portugal	114,212	21,074	41,991
Azores and Madeira	15,273	2,586	4,447
Spain	201,834	74,060	132,211
Canary Islands	92,024	43,375	27,910
Italy	802,488	281,967	494,121
Austria / Hungary	78,728	5,255	......
Hungary			......
Greece	61,042	7,714	15,305
Algeria	107,169	47,094	74,529
French West Africa	6,322	16,753	2,948
Portuguese W. Africa	19,187	26,722	......
Chile	46,523	1,699	112
Brazil	155,208	18,587	56,915
Uruguay	66,143	12,719	49,565
Argentine Republic	380,859	38,646	209,120
Channel Islands	14,636	8,357	14,703
Gibraltar	33,703	65,388	46,555
Malta	78,622	23,578	8,109
Egypt	358,847	97,318	185,606
Aden and Depdnd.	26,664	5,686	10,500
British India	27,189	......	67,602
Ceylon	26,115	3,706	19,998
Other Countries	195,439	99,492	177,003
Total	6,229,453	2,302,076	4,309,162

Pier and Bunker Prices, Gross Tons

Foreign Bunker Quotations by Cable to Coal Age

PIERS

	Feb. 11	Feb. 18†
Pool 9, New York	$5.65@$5.90	*$5.45@$5.90*
Pool 10, New York	5.35@ 5.55	*5.25@ 5.50*
Pool 9, Philadelphia	5.50@ 5.70	**5.60@ 5.75**
Pool 10, Philadelphia	5.15@ 5.35	**5.35@ 5.60**
Pool 71, Philadelphia	5.65@ 5.80	**5.75@ 6.00**
Pool 1, Hamp. Rds.	4.65	4.65
Pools 5-6-7 Hamp. Rds	4.30	**4.35**
Pool 2, Hamp. Rds.	4.40	**4.50**

BUNKERS

	Feb. 11	Feb. 18†
Pool 9, New York	6.00@ 6.20	*5.80@ 5.90*
Pool 10, New York	5.65@ 5.90	*5.60@ 5.85*
Pool 9, Philadelphia	5.75@ 6.00	**5.95@ 6.20**
Pool 10, Philadelphia	5.55@ 5.65	**5.75@ 5.90**
Pool 1, Hamp. Rds.	4.75	**4.80**
Pool 2, Hamp. Rds.	4.55	**4.60**
Welsh, Gibraltar	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	40s. t.i.b.	*39s. t.i.b.*
Welsh, Messina	36s. 6d. t.i.b.	36s. 6d. t.i.b.
Welsh, Algiers	35s. f.o.b.	*34s. f.o.b.*
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	40s. f.a.s.	40s. f.a.s.
Welsh, Teneriffe	40s. f.a.s.	40s. f.a.s.
Welsh, Malta	40s. f.o.b.	40s. f.o.b.
Welsh, Las Palmas	40s f.a.s.	40s. f.a.s.
Welsh, Naples	....	39s. f.o.b.
Welsh, Rosario	....	52s. 6d. f.o.b.
Welsh, Singapore	....	55s. f.o.b.
Port Said	49s. f.o.b.	*46s. 6d. f.o.b.*
Belgian, Antwerp	30s.	30s.
Alexandria	45s.	45s.
Bombay	38 rupees	38 rupees
Capetown	42s.	42s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Cardiff:	Feb. 11	Feb. 18†
Admiralty, Large	24s. 9d.	**25s.@25s. 6d**
Steam, Smalls	18s. 6d.	18s.@19s.
Newcastle:		
Best Steams	24s. 9d.	24s. 6d.@25s.
Best Gas	22s. 9d.	**23s.**
Best Bunkers	22s. 3d.	**23s.**

† Advances over previous week shown in heavy type; declines in italics.

Cincinnati Gateway

Huge Coal Shipments Enter Cincinnati Gateway

Movement Across Two Bridges Breaks all Previous Records—Open Shop Mines Fill Most of Increased Demand —Prices Not Much Stronger

Tremendous coal shipments have been passing through the Cincinnati Gateway recently. The number of loads moving over two of the bridges has broken all previous records. Much of the low-volatile tonnage was destined to Western markets. The bulk of the improved demand is being filled by open-shop mines.

Notwithstanding the heavier strain on production, prices have not greatly strengthened. Domestic coals are in a weather market, although good grades of smokeless are well booked up. The screenings market is the easiest of the lot, as the fines are coming forward in such quantities as to cause prices to barely hold firm.

CINCINNATI

Public utilities are now strong in the market and both mine run and certain preferred grades and sizes are showing more strength than for months past.

Low-volatile business is confined to the domestic makes—so far as stableness to that market is concerned. In this the most of the companies are booked ahead for two to three weeks and few if any of them are making March prices on lump and egg. Run of mine lags along, though a raft of shipments made to the Western markets has cut down the demand considerably from that quarter. Slack is hard to move and some of it has been sold in quantity below the dollar mark.

Sized gas coal is stronger and certain types of nut and slack have been in excellent demand. The splints have not been so much sought after. This has been a temperature proposition and the colder weather was followed with a heavy make of the larger sizes. There was another upturn to bituminous slack.

Retail business has been solid and encouraging. While orders were small in quantity they made up tonnage in the aggregate. Some companies had to fall back on outside trucks to make deliveries. Prices still range as formerly.

LOW-VOLATILE FIELDS

New River and the Gulf

The New River output now ranges around 30,000 tons daily. Demand is steadier in the West and Eastern markets are also more active. The Tidewater movement has been stimulated by heavier takings for bunkerage and New England.

The demand for Gulf coal is growing, particularly at Tidewater and Inland East markets. Production is estimated at about 60 per cent of capacity.

Pocahontas and Tug River

Pocahontas mines were active most of the week ended Feb. 11. The spot business has been materially increased by the impending strike possibility and certain consumers are stocking more heavily. Although not as active as a few weeks ago prepared demand is sufficient to hold prices firm.

Tug River production is also more satisfactory. More consumers are stocking in order to be prepared in case of a strike. There is a better Eastern demand and particularly a stronger market at Tidewater, although the bulk of the tonnage is destined for Western points.

HIGH-VOLATILE FIELDS

Kanawha

High mining costs and low market prices still preclude much resumption of work in this district. There is some additional business coming in, due to the prospect of a strike and domestic grades have also improved their position lately. The bulk of production, however, is on old contracts which are soon to expire.

Logan and Thacker

Logan production continues to increase, the output running about 50,000 tons daily. Steam users are taking storage coal and domestic grades are fairly active.

Operators are experiencing a little difficulty in securing all the hoppers needed for steam coal transportation and the labor supply is not heavy. Shipments by the river are now going forward, recent rains making it possible to remove some of this accumulation.

Northeastern Kentucky

Purchases are on a larger scale, although domestic demand appears to have subsided a little. However, the general policy of industrial buyers to stock coal against a strike has caused production to increase to perhaps 50 per cent of capacity.

SOUTHEASTERN KENTUCKY

Movement on all grades is better and a large number of mines in the Harlan-Bell fields have been able to run nearly full capacity. Call for domestic continues good, due to cold weather and most of the mines have all the nut and slack business that they can handle. Mine run is still a drug on the market and a very small tonnage is being produced.

Since screenings are becoming scarce, improvement is looked for in the near future on mine run. A few orders are already booked that allow the mines privilege of shipping mine run at a slightly higher price. Quotations remain unchanged.

West

DENVER

The domestic call is better, and this accounts for an increased output of 60,000 tons during the first week in February. Tonnage for the week ended Feb. 4 was 205,000 against 225,000 for the corresponding week in 1921.

Lump bituminous is $5 at the mine against $6 a year ago. The retail price of $10.75 for lump and $10.25 for nut has cut the retailer's margin from $2.50 to $2.35 on Walsenburg, and from $2.65 to $2.40 on Routt.

The mine price on lignite has dropped from $5.75 to $4, with a retail price of $8 instead of $9.75. Second-grade lignite is $3.50 instead of $4, and is selling for $7 retail.

The steam and slack markets are disorganized. Lignite slack has been cut from $4.50 to $3.20, delivered, by the smaller concerns, while the large companies offer their stock on a basis of $2@$2.25, delivered, in Denver. Bituminous slack is bringing $2.50 in the Trinidad district, the retail price having dropped $7.40 to $6.60, while Walsenburg and Routt slack brings $1.75@$2 at the mine and retails for $5.45.

The disorganization of steam and slack markets is due, in part, to the contract for sugar factories. Nine small concerns are supplying the factories in northern Colorado with approximately 50,000 tons of lignite slack at $1.50 @ $1.75 a ton. Heretofore, two large concerns have had the contract, and, according to reports, gave the smaller concerns 50c. a ton for coal that brought them $2.15. Now the large concerns are pushing their slack with a price of 50c. at the mine, refusing to accept the offers of the smaller companies, which have offered them $1@ $1.25 for their tonnage.

KANSAS CITY

Temperature near zero has strengthened the demand. Steam plants are on the lookout for storage coal.

The general impression is that if coal prices are reduced to pre-war basis and freight rates reduced it will go a great ways toward stimulating manufacturing and trade.

Prices f.o.b. mines are as follows: Kansas lump, $5; mine run, $4; nut, $4.50; slack, $2.50; North Missouri lump, $4.75; mine run, $3.50; washed slack, $3.25; raw slack, $2.50@$3; Arkansas lump, $6; mine run, $4; slack, $2.50@$3; McAlester Oklahoma lump, $8.50; nut, $7; slack, $2.50; central Illinois lump, $2.75@$3.25; egg, $2.50; slack, $1.25@$1.40.

SALT LAKE CITY

Retail business is holding up well and some of the big dealers are working overtime although the zero weather has passed. Stocks are very low. Operators are doing better than they were, but high freight rates and foreign competition have seriously interfered with the coast business.

The men who went on strike at the Cameron Coal Co. recently are returning to work on the company's terms.

Anthracite

Output of Hard Coal Gains; Steam Sizes Move Actively

Cold Spell and Improved Retail Distribution Help Production—Independent Domestic Prices Hold Firm—Dealers and Householders Buy Cautiously.

Heavier production of hard coal has followed the cold spell and better retail distribution. Independent domestic prices are holding firm on the favored sizes but all producers find trouble in disposing of pea.

Retail stocks were adequate to handle the spurt and dealers are reordering cautiously. The householder is still buying on a current basis only and this attitude is being reflected by his supplier, making a certainty of good-sized left-over stocks on April 1. The larger output has halted the rush for steam grades, but all sizes are moving very actively.

NEW YORK

Domestic coals are showing more strength. Although stove is the easiest to move there is no sluggishness. Egg coal is once more on the active list. Pea coal remains quiet.

Much of the demand indicates hand-to-mouth buying, both on the part of the dealer and consumer. Cold weather played an important part in last week's business.

During the cold spell the temperature reached the lowest mark of the winter and retail dealers reported active buying of one and two ton lots. In the outlying sections deliveries were hampered by the heavy fall of snow.

Heavier buying by dealers is expected in the early part of next month, but it is not expected that the majority of dealers will endeavor to lay in several months supply in anticipation of a long time suspension of mining after April 1.

It was reported that some of the companies were making concessions on their domestic price schedule in order to keep their coals on the move but this could not be verified last week.

The shortage existing in the steam coals has not resulted in the rush to lay in supplies as might be expected. With operations on a better basis and more of these coals coming forward, the demand cannot be said to be so active.

Buckwheat is the weakest of the steam coals but the better grades show no slump in quotations. Rice coal moves steadily while barley is the most active.

ANTHRACITE FIELDS

Zero weather increased the demand last week. All sizes are moving more readily, the only real sluggishness being in pea and production has moved up a peg.

The threatened strike probably has accounted for some of the increased demand. Even the most optimistic in the coal fields can see nothing but a suspension of at least 30 days from the first of April.

BUFFALO

Decline in demand has occurred from two or three weeks ago, and dealers are holding off, because of large stocks on hand and the anticipation that prices will be lower within a few weeks. Consumers are following the same plan as for some time past of buying anthracite as sparingly as possible, and many are using such other fuel as may be available.

The natural gas pressure has been unusually good this winter, and this substitute and domestic coke have displaced much coal. Offers of independent anthracite continue large and prices on ordinary sizes are weak. The smaller steam sizes are comparatively strong.

PHILADELPHIA

The first zero weather in two years has put old-time activity into the retail trade. Deliveries, however, have been somewhat difficult to make.

The dealers still continue to place limited orders with the shipping houses, although most of them have been increased on account of better trade conditions. Prices are well held by the independents. Pea is not wanted, however, and prices are slipping.

There seems to a noticeable betterment in the financial status of the retailers recently. They seem to have learned a valuable lesson after having granted so much credit during the summer and fall, which tied up much of their capital. Much of this trade has come back recently for refill orders, which with most of their trade lately, has been put on a cash basis, and the urgent need of fuel gave them a favorable opportunity to do this.

Steam sizes are still going good, especially buckwheat and barley. The companies are drawing heavily on storage yard stocks. Independents are getting full company price for buckwheat and barley, but only in occasional instances have they been able to get premiums.

The contract season on steam coals is fast approaching and consumers are anxious to know what stand the companies will take on prices. There is a feeling that with the low soft coal prices and a probable reduction in mining costs, that $3 will be a contract basis for buckwheat. Of course, all of this intimation comes from the consumer.

BALTIMORE

The usual troubles of frozen coal, etc., were encountered last week but the demand was not enlivened. The spell of cold weather brought only a small spurt of ordering.

Of course, left-over stocks, might be a good thing if a strike holds up production this spring, but on the other hand the frequent failure of strikes to materialize has brought many to feel that the present trouble will be smoothed over in some way.

Coke

CONNELLSVILLE

A week ago the coke market was reported with a stiffened undertone, due to operators turning their attention more to coal. In the past few days the market has been subject to actual demand of tonnage importance.

One furnace, just blown in with coke purchased in the spot market, contracted to July 1 at $3.25. An inquiry for prompt furnace brought price of $3.50.

Even at $3.50 coke is hardly as profitable as coal if well sold in the present market, but some operators have not had good channels of distribution for coal and some have had to make one drawing a week of furnace coke, to keep ovens cool, when their regular trade was in foundry coke. The demand for foundry coke has increased farther.

The market is now quotable as follows: Spot furnace, $3.25@$3.50; contract furnace, $3.25; spot foundry, $4 @$4.25.

The *Courier* reports production in the week ended Feb. 11 at 58,000 tons by the furnace ovens, and 33,520 tons by the merchant ovens, making a total of 91,520 tons, an increase of 1,330 tons.

UNIONTOWN

Coal and coke markets in the Connellsville region present a peculiar situation. With the strike threat in the union districts now definitely out in the open coal should be a live subject in this unorganized field. With the steel industry far from out of the woods the coke market should show no unusual signs of activity. Yet the exact opposite is true.

While coal remains comparatively unsalable consumers are combing the region for furnace coke and the price has gone from a minimum of $2.75 to $3 and at present most sales are being made beyond that figure, $3.25 being the maximum.

While the Connellsville region could produce an enormous tonnage if need be, there has been little real activity even in preparing the way although there has been a lot of talk about inquiries for after April delivery. Only small sales are being made on steam coal at $1.30@$1.40 and byproduct at $1.60@$1.80.

BUFFALO

Some dealers have worked up a fair demand for domestic coke this winter, its cheapness recommending it in place of anthracite.

Coke for industrial uses is in very moderate demand and prices are easy at $4.25 for 72-hr. Connellsville foundry, $2.85@$3.15 for 48-hr. furnace, and $2.65@$2.75 for stock, with some domestic sizes $3.75, to which add $3.64 for freight.

Eastern Inland

Rush of Inquiries Fades With Reduced Consumption

Despite Talk of Strike, Lull in Buying Occurs—Lessened Requirements Render Stocks Nearly Ample for Eventualities—Railroads and Utilities Now Principal Buyers.

Despite the strike talk a buying lull has occurred in the Eastern Inland market. Tonnage is in heavier volume than 30 days ago but the recent rush of inquiries has subsided. Caution is prompting good reserves, but low consumption has rendered recently acquired stocks nearly sufficient as a safeguard against any interruption to production.

The major portion of the reserve coal moving is for railroads and utilities. Non-union operators point to their proportion of the present tonnage moving as indicative of their ability to furnish needs over the strike period. Distress coal has disappeared, but prices have not strengthened materially.

CLEVELAND

Coal men in this district are somewhat baffled by the continued pronounced apathy on the part of consumers. For some reason, not exactly clear, the late buying movement has been sidetracked.

Operations are slightly better, it is true, due largely to purchases by railroads and public utilities. Many industrial users are sparring for time. They lack the available cash to tie up in coal and before they make a special effort to do any storing they want to be more clear on the course of their own business over the next few months and to analyze the strike situation.

Industrial managers are hoping that there will be no strike and that if it comes it will be short lived. Operators have just about abandoned hope that a big buying movement will burst forth. Some, however, still cling to the belief that by the middle of March the market will be filled with orders and that prices will go higher. For the moment quotations remain unchanged.

Retail dealers have been helped slightly by an order for 8,000 tons of school coal, distributed among a number of firms. Householders, on the whole are buying sparingly. Pocahontas grades are selling lower. Shoveled lump is now quoted at $9 a ton and mine run at $8.

BUFFALO

Some increase is occasioned by the probability of a strike at the mines, but as stocks held by consumers are generally large, and showing little depletion, trade is far from satisfactory. The car order is the rule.

Arrangements are being made by local sellers to obtain a good supply of non-union coal when it may be wanted. The only fear expressed is that the railroads may confiscate much of the coal shipped, since their supplies are short. This is a feature of the situation which many consumers have not considered, but which may have an effect upon prices.

Prices are showing little change, although competition is severe. Some consignment coal, threatened with demurrage charges, is being sacrificed occasionally. Quotations continue at $2.75 for Youghiogheny lump, $2.50 for Pittsburgh and No. 8 lump, $2.25 for Allegheny Valley and all mine run and $1.50@$1.75 for slack, adding $2.36 to Allegheny Valley and $2.51 to other coals to cover freight.

COLUMBUS

With the probabilities of a strike after April 1 appearing more certain, buying to guard against a suspension of operations becomes more general. The movement has not reached any great proportions in Columbus and central Ohio territory, as it is known there will be a considerable non-union production which will help to relieve the situation.

Buying of steam grades is the best feature at this time and some rather large orders have been booked for shipment the latter part of February and during March. Public utilities are still one of the best features.

Extremely low quotations are not heard of as often as formerly, but on the whole the price list has not been increased. Screenings are stronger and prices have been well maintained at the advanced levels.

Domestic demand is steady but not rushing. Dealers' stocks are not large but with mild weather their trade is not active. Retail prices are rather steady at former levels.

Production has increased slightly under the influence of better buying. The Hocking Valley is running about 30 per cent of normal and Cambridge and Crooksville is estimated at 25 per cent. In eastern Ohio the output is something above the 40 per cent mark.

EASTERN OHIO

That coal is being stored is revealed by the continued upward trend in production. Output for week ended Feb. 11 amounted to 372,000 tons, or about 60 per cent of potential capacity.

Association mines are averaging about 50 per cent of full time. Cumulative figures show that eastern Ohio has produced 1,980,500 tons during the calendar year or about 54 per cent of potential capacity as compared with 51 per cent for the same period last year.

Some new life has been experienced in the retail trade due to the higher rates for natural gas. Many are filling their bins with sufficient coal to carry them through the balance of the winter. Retail yards, however, are well stocked.

According to a survey recently made, it is calculated that within two weeks public utilities, hospitals, water-works plants, etc., will have a minimum of 60 days' supply of fuel on hand, indicating the safeguards they have thrown around their operations.

Spot prices remain at about the same levels, with the exception of a slight stiffening in mine run and lower grades of prepared sizes.

Bituminous coal receipts at Cleveland for the week ended Feb. 11, amounted to 1,814 cars; 1,353 for industrial concerns and 461 for retail yards. This is an increase of 219 cars to industry over the previous week, but only 5 cars increase to retail yards. During the past eight months average weekly receipts have been under 1,000 cars.

PITTSBURGH

Inquiry continues to broaden, but the district is doing only a trifle more business than formerly, price still standing in the way. Open-shop fields, while selling considerably more coal, are securing only a shade higher prices and thus the union Pittsburgh district is not helped materially. For Connellsville steam mine run, $1.50 is now a low price, $1.60 being more common, while a few weeks ago $1.50 was being cut frequently.

Buyers seem to expect a cessation of operations at the union mines April 1, but are very cautious as to price, in making purchases. Operators feel that the scale recently published is offered to the miners individually or to the collective body at each mine, and will not be placed before the national officials of the United Mine Workers.

The market remains quotable as follows: Steam slack, $1.30@$1.50; gas slack, $1.60@$1.70; steam mine run and ordinary gas, $2.10@$2.20; ¾-in., $2.60@$2.70; Panhandle 1¼-in. domestic lump, $2.75@$2.90; high-grade gas, mine run, $2.75@$3.

NORTHERN PANHANDLE

Aside from a growing interest, due to the probability of a strike, market conditions remain unchanged. The output is fluctuating around 60,000 tons daily, a large part of which is for railroad consumption.

DETROIT

While the generally unsatisfactory situation in industrial lines is conceded to be largely the cause of the comatose coal market, other factors are also exerting a retarding influence. Buyers find they are able to supply current requirements by picking up small tonnages in the spot market.

The belief that a reduction in railroad freight rates will be announced in the near future, is causing some buyers to hold back. Even the probability of a strike fails to stimulate buying, as consumers figure that there would likely be a sequential lowering of coal prices. Tonnage from the unorganized districts encourages the expectation that coal will be available when needed.

Three-inch Ohio lump is quoted at $3, 1¼-in. lump, $2.75; egg, $2.25; mine run, $1.90; nut and slack, $1.50@$1.60. Four-inch West Virginia lump is $2.60 @$2.75; 2-in. lump, $2.25; egg, $2; mine run, $1.65; nut and slack, $1.25. Pittsburgh No. 8 1¼-in. lump is $2.35; ¾-in. lump, $2.25; mine run, $2; nut and slack, $1.66. Smokeless lump and egg is $3@$3.25; mine run, $2@$2.15; nut and slack, $1.25.

North Atlantic

Brisk Trading Subsides; Volume of Inquiries Good

Actual Sales Slump Below Expectations —Industrial Consumers Reluctant to Stock up Without Further Evidence of Long Tie-Up—Tidewater Business More Active.

Better trading, which developed earlier in the month, has subsided. Inquiries are still being received in good volume, but actual sales have slumped below shippers' expectations.

The industrial buyer is feeling his way cautiously. The miners' convention at Indianapolis resulting in no demand for an increased bituminous scale, the consumer wants some further indication of a long tie-up before stocking in anticipation of it. Prices are not lower, but closings at the figures recently quoted are more difficult to make. Tidewater business at Philadelphia and Baltimore is more active.

NEW YORK

Line demand for bituminous coal is showing more activity than at Tidewater. Better grades continue to be well sold up.

That some operators and shippers did not benefit by the lesson taught as a result of over-shipments to this Tidewater following the threatened railroad strike of last fall is evidenced here now. There were upward of 2,400 cars reported at the various docks on Feb. 17, much of which was shipped without orders. In addition, there were about 50 loaded boats in the harbor waiting for buyers.

Consumers are not showing any desire to prepare for a suspension of mining and the various reports relative to a shutdown do not tend to excite them. The trade, however, believes that as the threatened suspension draws near consumers will enter the market. At present some shippers are having difficulty in inducing consumers to take their full quota on contract and many requests have been received asking for curtailment in deliveries.

Inquiries regarding contracts are being received in large numbers and in some instances sample cars have been shipped in order to make a test of the coals offered. Some of the large railroads have closed new business at comparatively low figures.

BALTIMORE

There is little satisfaction in the general condition. Prices are weak and uncertain from day to day. The public seems to be becoming more and more convinced that a strike is likely, but except for a few individual spurts in buying this has not tightened the market.

The poor price for even the best steam coals is so low that there is little encouragement for decent preparation. The effect is to turn a number of users of high-grade coal to the taking of ordinary fuels, as they can see not so much difference as formerly in grade. In the Fairmont district the demand for slack has been of such a nature, without a corresponding call for lump, that the operators have been offering screen coals as cheap as the run of mine.

The export movement is showing some improvement. For the first ten days of February there were four clearances, a total of 12,584 tons cargo and 1,610 tons bunker. The entire month of January showed only a movement of five vessels with a total of 19,488 tons cargo and 800 tons bunker.

UPPER POTOMAC

As a result of some private wage agreements, production has been slightly stimulated, although idleness is still general. Prices remain so far below production costs that most plants are debarred from re-entering the market.

PHILADELPHIA

There is a fair demand but no sign of a rush. The recent severely cold weather has had a tendency to increase consumption, but most large users are well fortified by fair reserve stocks.

There has been some show of increased strength in spot quotations, but it seems to have been somewhat artificial, being forced by some shippers who felt that conditions would warrant higher quotations. However, they have not been able to maintain even the slight increase.

There does not appear to be any permanent improvement industrially, as some of the big iron plants in this district which have been making fair progress, have again shown signs of reduced activity. The belief still persists, however, that betterment is just around the corner.

Tide conditions show no change, except that prices are perhaps a trifle stronger, no doubt due to strike talk. There are no large stocks at the piers, but such business that offers, bunker or export, is quickly cared for.

FAIRMONT

There was a slight betterment of conditions during the week ended Feb. 11. The increase in demand was almost wholly attributable to the strike talk. Tidewater shipments were in larger volume but the movement was decidedly irregular. Prices remain virtually unchanged.

CENTRAL PENNSYLVANIA

The desire to stock up with fuel has stimulated production but prices throughout the field remain stable. Some of the mines which have been idle have been working on part time during the first half of February.

In the non-union sections of the field, production has increased more rapidly than in the union sections, owing to the fact that they are able to compete with other fields in the matter of a better price.

Chicago and Midwest

All Branches of Coal Trade Show Increased Activity

Railroads and Utilities Set Example for Smaller Consumers in Storing Steam Coal—Domestic Retailers Replenishing Stocks—Smokeless Sold Off-Price to Avoid Demurrage.

More activity is noted in all branches of the trade. Steam coals are moving better, the bulk of the increase going into storage. Railroads and utilities lead in this movement and, being the largest coal buyers, this policy is significant. It might well be heeded by the smaller consumer with a view to protection against strike trouble. Domestic movement is better, as many retailers have been forced to replace tonnage sold through the recent cold spell.

Heavy shipments of smokeless coals have been sold at off-prices on the Chicago market to avoid demurrage. Southern Illinois prices on prepared sizes have been reduced to meet non-union competition and induce storing. Many operators are sold up to April 1 on steam sizes and buyers are seeking non-union connections.

Domestic coals show considerable activity, as there are many retail dealers who are accumulating a little surplus in the event of a prolonged coal strike. Buying, however, on the part of the retailer is not as general as it might be, particularly in the Northwest, as the retailers in that section know they can depend on the docks to supply, even if the shutdown lasts all summer.

Steam demand is increasing steadily, and many operating companies report that they are sold up on as much steam coal as they can produce between now and the first of April. This being the case, there is a very noticeable tendency on the part of wholesalers to offer their trade steam coals from the non-union fields which have advanced. Steam buyers are influenced very largely by newspapers. For instance, if some of the dailies with wide circulations in the Middle West come out with an article predicting a long strike, the effect of this article is felt immediately and stimulates the steam market, whereas if these same papers publish some news to the effect that the United Mine Workers are showing a more conciliatory attitude, then the demand immediately drops off.

When the Indianapolis convention came out with a statement that they were not going to demand an increase, this news came as a great surprise to the whole trade, who thought that the United Mine Workers would demand a sharp increase as well as perhaps four or five days a week. The trouble between Lewis and Farrington, the president of the Illinois United Mine Workers, is rapidly coming to a showdown.

It is expected that very important developments will come from the joint meeting of some of the Railway Brotherhoods and the United Mine Workers, which took place in Chicago, Feb. 21. After this meeting the country will doubtless know whether or not the brotherhoods are going to cooperate with the miners.

INDIANAPOLIS

Screenings have advanced in price and the general indications are that further increases will be noted as it becomes more apparent there will be trouble around April 1. Industries are watching the situation very closely.

The general tone of the market is firm in spite of little increase in demand. It has become known that many of the larger factories and utilities have anticipated the trouble to some extent and have been laying in reserves for several weeks. The stocks, however, are not nearly sufficient for a prolonged period of idleness on the part of the miners.

ST. LOUIS

Reasonably seasonable weather prevails and domestic business is fairly good for the cheaper grades. The dealers here are pretty well supplied and the only coal going into storage seems to be Mt. Olive and Standard.

There has been a movement of about 75 cars of anthracite, various sizes, here in the last ten days for shortage against a strike. Coke is doing fairly well, everything considered, both gas house and byproduct.

Steam business is picking up and several dealers having steam contracts are getting ready to store coal, figuring on a shutdown of 60 days, while a few others are storing 90 days' supply. Coal is going into storage so slowly that it does not disturb the market.

Country domestic is exceedingly quiet, and the same might be said with regard to steam. Considerable steam has moved through the St. Louis gateway to Kansas City and Omaha and a fairly good Standard tonnage continues to move to Chicago.

CHICAGO

The Chicago market continues in a state of activity. The domestic market, on account of the recent cold weather, is fairly satisfactory. Smokeless coals, however, had a little set-back this week, owing to the fact that one big shipper had nearly sixty cars of mine run on track drawing demurrage. Some of this is still on track, although prices have been cut right to the bone.

It is rumored that the Franklin County operators are going to revise their circular price on lump furnace and small egg to $3.65 per ton, in order to give the retail trade some inducement to stock up before the strike comes.

Kentucky and West Virginia coal, on account of their extreme hardness, have always been popular and now that they are to be had at a low price, f.o.b. mines, which more or less neutralizes the high freight rate, these coals are growing in popularity. Anthracite is in fairly good demand, but there has been no great tonnage on the market.

The steam coal market fluctuates from day to day. The general trend, however, is to higher levels. A great many of the industries in Chicago see a little business ahead and this, combined with the possibility of a shutdown in the Illinois and Indiana fields, has stimulated purchase to a marked degree.

The change for the better in both the steam and domestic markets of Chicago has brought about a very much better feeling and tone to the entire trade. The coal man is now able to see that conditions are on the mend and that normal business in the near future is a reasonable thing to expect.

LOUISVILLE

There is a great deal of uncertainty in the market at this time, with the trade generally afraid of contracts of any kind, and some concerns only accepting small current orders. The big houses are taking business freely for short term or immediate delivery.

Operators are anticipating a stiffening market shortly, and are therefore anxious to hold their tonnage available to take advantage of any upward tendency.

Lump is slow as a result of continued balmy weather, and retailers are cleaning up yard stocks, showing no interest in buying. As a result screenings are scarce and mine run is in better movement.

No big demand is in sight until the Lake movement starts, unless "protection buying against strike" increases considerably over the present level. Right now movement is considerably more active than it has been. While the kind of equipment desired is sometimes a little scarce, there is no car shortage.

General prices today in the field are closer together than for weeks, the cheapest quotation on screenings being around $1, while the stiffest price on lump is $2.75. At that it is hard to find screenings at a dollar, and block is being shaded.

SOUTHERN ILLINOIS

There has been increasing activity in the Carterville field on account of the demand for storage for railroads. While steam business is somewhat spasmodic, it is moving sufficiently well to bring about better price conditions.

Association circular of $3.65 prevails in a way on the lump, egg and nut, but independent prices govern when coal has to move and these range anywhere from $3 on nut to $3.50 on lump and egg. Mine run is slow and $2.75@$2.85 is about the range. Domestic movement is lagging. Working time shows one to four days, while many mines are idle.

In Duquoin and Jackson counties somewhat similar conditions prevail. The Mt. Olive situation has picked up some. Working time is better and prices for screenings are stronger. Railroad tonnage is good.

The Standard field is picking up some for steam and domestic. Railroads are buying some additional coal for storage and screenings have moved up. Steam nut and egg are a little slow. Indications are that all prices will advance shortly. Mines that are working average two to four days a week.

WESTERN KENTUCKY

Demand is more active, and screenings production is being taken up rapidly. Brokers are so sure of a higher market that they are again shipping coal on consignment. Screenings are so scarce that some buyers are now taking mine run, which will have to be crushed in order to use in automatic stokers.

The time is rapidly coming, when some operators may find it necessary to put in crushers. A few years ago western Kentucky had a ready market for lump coal, and was forced to dump screenings. Today there is a steady demand for pea and slack with no increased call for domestic.

Railroads are buying a little more freely, and there is a steady inquiry from industrial concerns for prices, with some orders. The field as a whole is more active. However, it is said that if the strike does not materialize, steam consumers will be fairly well stocked in the early spring, and one of the slowest markets in years will result.

South

BIRMINGHAM

Consumers are showing little interest in the market and there is not much buying in any grade of steam or domestic. It will apparently be some time yet before industry reaches a stride which will create any appreciable increase in the demand for coal. In the meantime orders are confined to the spot market and cover only needs of the immediate future.

Railroads are taking contract coal on a little more liberal basis, which will better the working time at mines holding contract agreements. Otherwise the movement of coal from commercial mines shows lack of improvement. The requirements of the furnace companies, railroads and other utilities are sustaining production on the present basis of around 230,000 tons weekly.

Prospects for better market conditions at domestic operations are not encouraging. Orders come mostly from small dealers who either failed to stock at all or on a small scale, and have been enabled to dispose of such stocks and are taking a few cars off and on as demand necessitates. Dealers with large stocks are clearing their yards as rapidly as conditions will permit and are taking losses in many instances in order to do so. There has been no material change in mine prices the past week.

VIRGINIA

Supplementing the usual flow of contract coal, steam users are adding to their reserve stocks to insure tonnage over the possible strike period. Buying of prepared coals is also more active and production is slowly climbing upward. The increased demand, however, is not affecting prices.

Northwest

Domestic Demand Fitful; Industrial Low, in Northwest

Orders Fluctuate with the Temperature—Only Shipments All-Rail Affected by Strike Talk—Dock Supplies Adequate for All Requirements.

Fitful weather has caused an irregular domestic demand. Orders fluctuate with the temperature. Industrial activity is still at a low ebb while the stocking program against a strike has not been felt, aside from moderate shipments all-rail.

Purchases for reserve are being deferred as dock supplies are adequate. Consumers have no desire to tie up much-needed capital in coal stocks when their source of fuel supply is in an excellent position to make shipments when needed.

DULUTH

Survey of stocks on Duluth-Superior docks has shown that on Feb. 1 the docks contained 4,500,000 tons of bituminous coal and 600,000 tons of anthracite. Railroad stocks are placed at 900,000 tons.

All docks have been busy on the strength of continued cold weather and heavy snows. It is thought that February shipments will come close to those of January if they do not actually exceed them. The month started poorly, but has picked up remarkably.

Youghiogheny and Splint screenings are selling at $4.25@$4.75. The demand this year seems to be greater than ever, due to many large consumers using screenings as a substitute for higher-priced coals.

Anthracite is moving in satisfactory quantities for the first time this winter. Dealers are putting in stocks, where before they were content to order enough to carry them from hand to mouth. Evidently the cold snap and a two-day partial tie-up in the railroads has caused sufficient apprehension of a shortage to make dealers put in stocks.

A big drop in anthracite prices is expected after the first of April and dock men are hastening to get their large supplies off their hands. Soft coal will hold firm, it is thought, as a price readjustment in that has already taken place.

MINNEAPOLIS

There is a sort of rag-time fluctuation to the way coal orders come this winter. When the thermometer goes down, the orders rush in, but the weather has been fitful, with a day or two of cold and a day or two of mild. Orders have kept pace both ways.

The net effect has been to increase the domestic consumption considerably more than was expected a month or six weeks ago. But industrial demands have not been materially affected. Manufacturing in almost all lines has been held down to a minimum for many months and is not greatly increased at this time. Public service plants utilizing water power have been compelled to use more steam than usual because the severe weather has held back the snows and there has been little thawing.

As compared with a year ago, the tonnage moving is better. But against the stocks on hand, the situation is less encouraging than a year ago, despite the mild weather. There will be a liberal tonnage carried over the season in spite of all the increased consumption which the severe weather may bring about.

The all-rail trade has been moderate. It sells heavily to the industrial and steam plant trade and the former has been inactive. The latter has had the advantage of the sharp competition from the dock trade, which has a large tonnage on hand and desires to run it down.

Now and then there seems to be a little business coming in from those who wish to prepare against the coming strike. Even a moderate advance in price as a result of the actual suspension will probably not cause any serious regrets over not buying. For most people seem to feel that they would rather pay whatever price they may have to at the time the coal is needed than to buy ahead of time and save money in so doing.

MILWAUKEE

Frequent spurts of zero weather have served to stiffen the demand for domestic coal, and deliveries have been at a high tension. Soft coal is more active as large industries are accumulating supplies in anticipation of a strike in the spring. Prices are steadily maintained with a seeming lack of competition except in screenings.

The Canal St. hard coal sheds of the Milwaukee Western Fuel Co. were destroyed by fire last week, causing an estimated loss of $150,000. There was about 25,000 tons of anthracite in the sheds, considerable of which was burned. The plant of the Lehigh Valley Coal Sales Co. was slightly damaged.

Coal-Mine Fatalities Fewer, Ratio to Output Higher, Last Year Than in 1920

ACCIDENTS at coal mines in the United States in 1921 resulted in a smaller loss of life than in any year since 1903, according to a report just compiled by the U. S. Bureau of Mines. Information received from all state mine inspectors shows a total of 1,973 men killed, as compared with 2,271 in the preceding year, a reduction of 298 fatalities, or more than 13 per cent. The decrease was due largely to the fact that the bituminous mines were idle much of the year, the total production representing a decrease of more than 23 per cent below 1920.

For every million tons of coal produced the fatality rate for the past year was 3.99, while for 1920 it was 3.52. Paradoxical as it may seem, it is believed that the idleness of the mines during much of the year, while resulting in fewer lives being lost, nevertheless was partly responsible for the increased accident ratio on the basis of production. Underground operations tend to become more hazardous during periods of idleness, because of increased likelihood of roof falls, gas accumulations, etc., as well as a lessening of the morale of the workmen, resulting in more frequent accidents when the men return to work.

Most of the fatalities were, as usual, due to falls of roof and side, and haulage accidents. The year was remarkably free from large disasters, there being but five accidents killing five or more men each, resulting in a total of 34 deaths. These deaths constituted but 1.7 per cent of the year's total of 1,973 fatalities, a lower record than for any year during the past decade.

Newport News Exchange Adds Six New Pools

COAL AGE is in receipt of a letter, dated Feb. 16, from J. F. Shaffer, assistant commissioner of the Newport News Coal Exchange, Inc., Newport News, Va., in which he takes exception to recent reports that the closing of the Sewalls Point Coal Exchange marks the discontinuance of the last of the coal exchanges at the Atlantic seaboard. Mr. Shaffer states that the Newport News Coal Exchange, Inc., which was the first exchange organized at Hampton Roads after the liquidation of the Tidewater Coal Exchange, is still a going concern, and because of the urgent requests of many of its members the directors at meeting on Jan. 27, 1922, not only unanimously decided that the exchange should continue but made definite plans for furthering its activities and usefulness in the interest of the tidewater coal trade.

A revised classification will be ready for distribution about March 1. The principal feature of this new clasification, aside from bringing the classification of the mines up to date, is expansion of the present pools by establishing pools 15, 16, 36, 37, 45 and 46. The purpose of these new pools is to bring about a refinement of the grades of coal by selecting the mines producing by quality and preparation the highest grades and putting them into these new pools. The full inspection force of the exchange will be maintained, both in the field and at the piers.

News Items From Field and Trade

ALABAMA

Forty-five applicants passed the examination at the January session of the state board of examiners held in the office of Chief Mine Inspector C. H. Nesbitt. Certificates of competency were issued to thirty-five first-class mine foremen, five second-class, and five fire bosses.

At a meeting of the creditors of the **Montevallo Mining Co.**, which recently filed a voluntary petition in bankruptcy, held before Federal Referee E. H. Dryer, David Roberts, Jr., connected with the Brilliant Coal Co., was named trustee. The most important matter for the consideration of the court was the offer of the State of Alabama to buy and operate the properties of the bankrupt.

ALASKA

The first shipment of Mantanuska coal since 1906 is now on the sea en route from Anchorage, the Northern coal port, to Seattle. This shipment, although small, is of interest as it indicates a resumption of commercial mining in the Mantanuska district.

CONNECTICUT

At a recent meeting of the **Karm Terminal Co.**, wholesale and retail coal and coke dealers, Bridgeport, it was decided to change the name of the concern to the **McNeil Terminal Co.** Kenneth McNeil, Roderick McNeil and Archibald McNeil, Jr., still remain as officials.

Harris & Gans, coal merchants, South Norwalk, plan to construct a two-story addition at their plant in that city. Plans are being drawn by Architect Arthur S. Meloy, Stratford.

A. H. Powell, wholesale coal dealer, New Haven, is planning the erection of a twelve story business building, to cost about one million dollars, on the corner of Church and Court streets.

ILLINOIS

Creditors of the **Moro Coal & Mining Co.**, will collect but a small portion of their claims from receipts of the sale of the property at Moro, a few days ago. The mine was sold under order of the Madison County Circuit Court after the affairs had been under the control of Louis Pawlica, as receiver for several years. It is said that the indebtedness of the company amounts to between $16,000 and $17,000. The creditors may receive about 30 per cent of their bills.

Bondholders who bought in the Indiana coal railway division of the Chicago & Eastern Illinois R.R. have offered to sell the road to McGuire-Cummings Co., of Paris, for $450,000. The company believes it can operate the division with light equipment and diminished service and it is considering the $450,000 offer.

Fire supposed to be from an old gob pile broke out recently in the mine at Ward, resulting in the death of a pump man, who was suffocated by the smoke during the early morning hours. The mine was sealed the following day for a period of thirty days by state officials. It was recently purchased from **McElvain-Hoy Coal Co.**, of Chicago, by **W. A. Perrine**, of Herrin. It is an old mine with an unfortunate speculative career with owners beyond recollection.

Sale has been made of the Signal Hill Coal Co., and other properties to the **Signal Point Coal & Coke Co.** The mine is located in the Harper Hills near Belleville. Stockholders in the new company, which is capitalized at $35,000 are: Philip H. Cohn, East St. Louis; Elmer Wangelin, Belleville, and M. Greenberg, St. Louis.

The Atlas Coal & Coke Co., Chicago, has been appointed exclusive sales agent for the output of the **Fayette-Jellico Coal Co.**, of Anchor, Ky.

The Peabody Coal Co., of Chicago, is equipping the cages at mines Nos. 7 and 8, Kincaid, with Nolan automatic horn stops.

To assist in the conduct of engineering research and to extend and strengthen the field of its graduate work in engineering, the **University of Illinois** maintains fourteen **Research Graduate Assistantships** in the Engineering Experiment Station. Two other such assistantships have been established under the patronage of the Illinois Gas Association. These assistantships, for each of which there is an annual stipend of $600 and freedom from all fees except the matriculation and diploma fees, are open to graduates of approved American and foreign universities and technical schools who are prepared to undertake graduate study in engineering, physics, or applied chemistry. Additional information may be obtained by addressing The Director, Engineering Experiment Station, University of Illinois, Urbana, Ill.

Following a visit of C. M. Moderwell to the Cincinnati offices of his company announcement was made that **G. Trueman Landberg**, formerly with the Tuttle Coal Corporation, will be associated with the Cincinnati sales forces.

INDIANA

A petition signed by 3,964 voters asking that a municipal coal yard be established in New Albany was presented to the New Albany City Council recently.

The Indiana Fourth Vein Mining Co., has been incorporated with a capital stock of $100,000. Incorporators are George O. Royland, Thomas D. Haskett and Walter S. McCloud.

The United Mine Workers have called off a strike in the Clinton coal field, where 700 miners employed by the **Clinton Coal Co.** have been idle since last October as a result of the discharge of a pumper employed at the Crown Hill Mine. The union has taken the matter up with Phil Penna, of Terre Haute, secretary of the Indiana Bituminous Coal Operators' Association, and has instructed the secretaries of the locals at mines in the Clinton field to instruct their men to return to work, as soon as the Clinton company gets ready to operate its mines.

The Pine Ridge coal mine and a lease on 1,000 acres of land at New Goshen, Vigo County, are to be acquired by the **Binkley Coal Co.**, an Illinois corporation capitalized at $500,000, which has qualified to do business in Indiana. L. G. Binkley, of Chicago, is president of the company.

KENTUCKY

The Nagela-Elkhorn Coal Co., is the name of a new $300,000 coal corporation organized at Whitesburg. Thomas E. Jeffries and others of Huntington, W. Va., are in the corporation. They have taken over the plants of the **Logan-Elkhorn Coal Corporation** at Parsons and Whitaker in the Boone's Fork field and will make improvements in the plants which will enable them to increase production.

The Rockhouse Coal Co., on Rockhouse Creek near Blackey, will make several improvements in their plant this year, which will include the building of a large number of miners' houses. This work will start at once. In the same section the **Dudley Coal Co.**, will make early improvements.

R. H. Heyser, formerly connected with the A. J. King interests in the Logan field, is now superintendent of Majestic Collieries Co., at Majestic.

LOUISIANA

H. E. McCormack of Birmingham, vice-president and general manager of the Pratt Consolidated Coal Co., one of the largest operations in Alabama, heads the **Consolidated Fuel Co.**, organized recently in New Orleans. The new corporation is capitalized at $100,000 and will furnish coal to ships. Branches will be established in Pensacola, and Mobile. Coal will be mined in Alabama, shipped by rail to New Orleans and by barge to Mobile and Pensacola. Other officers of the company are R. J. Milling, president of the Bay City Fuel Co., Mobile, secretary; Frederick Gilmore, representative of the Pratt Consolidated Co., vice-president; R. P. Hyams, New Orleans, vice-president and general manager; H. C. Whitman of New Orleans, vice-president and Charles Harrington, president of the Harrington Steamship Co., New Orleans, manager.

NEW JERSEY

To provide increased facilities for handling coal at the **Pennsylvania System Coal Terminal**, at South Amboy, the company has put into operation a new "thawing shed." This addition to the South Amboy facilities accommodates twenty cars at one time, and was installed to maintain regular service, especially for public utilities dependent upon this coal terminal for a large amount of their fuel supply. The dumping is done by machines which lift the car and turn it over in order that the coal may run out, the car then being returned by gravity to the yards, from which it is moved back to the mines. There are at South Amboy two coal dumpers, each having a thawing shed, which now places the Pennsylvania system in a position to reduce to a minimum any delays resulting from frozen coal.

NEW YORK

J. C. Pack, of Bluefield, interested in smokeless properties in southern West Virginia, was a visitor in New York attending the meeting of the smokeless operators.

A recent visitor in New York and other Eastern markets was **M. L. Taylor**, of Morgantown, vice-president of the Morgantown Coal Co.

O. Y. Warren has been appointed resident manager of the Empire Coal Mining Co., with offices at 1 Broadway, New York City. Headquarters of the company are in Philadelphia.

The Columbian Rope Co., Auburn, has presented the trade with its usual, attractive calendar for 1922.

To take care of increasing tonnage of anthracite, the **Haddock Fuel Corporation** has made arrangements with **W. H. Bradford & Co., Inc.**, whereby the latter will handle sales to retailers and manufacturers in the New England states, New York City, Long Island and the New Jersey seaboard. The New York office of the Haddock Corporation will be located with W. H. Bradford & Co., Inc., at 17 East 42nd St., New York City.

E. B. Merriam, formerly director of industrial relations, has been appointed executive engineer of the switchboard department of the General Electric Co. Executive headquarters of the department are at Schenectady under the management of J. W. Upp.

W. I. Smith and B. C. Hendrickson for many years associated with Borden & Lovell announce the formation of the firm of **Smith & Hendrickson**, with offices at 11 Broadway, New York City, where they will conduct a general wholesale anthracite and bituminous coal business.

The Braddock Coal Co. has been incorporated, with capital stock of $10,000. The incorporators are George O. Golden of Cumberland, Md., and Ralph W. Archdeacon and Stuart J. Saks of Buffalo. It is a branch of the Braddock Coal Co. of Cumberland and has been in operation in Buffalo some months under the name of the **Archdeacon-Saks Co.**

J. G. Miller, of the **Raleigh Smokeless** Coal Co., Norfolk, was in New York recently on business.

OHIO

John H. Patterson, pioneer of industrial welfare work, whose activities along that line have attracted world-wide attention, took another philanthropic step on Jan. 1, when he, with other owners of The National Cash Register Co., started the Dayton Foundation Fund. This is a fund to be used for the very highest type of charity and benevolent purposes. The principal of the accumulated fund is to be held as one common trust fund, and the income used for the benefit of the community in such manner and for such purposes as the future may prove to be most desirable. The first contributors to the fund are: Jonh H. Patterson, who gives $137,500; Mrs. H. G. Carnell, $93,750; and Robert Patterson, $18,750.

The foundation plan is not an experimental one. It originated in the mind of Judge Frederick H. Goff, who in 1914 established the Cleveland Foundation. Since that time similar foundations have been established in nearly forty large centers covering all parts of the United States.

T. K. Maher, president Maher Collieries Co., Cleveland, is leaving shortly for a vacation trip to Bellaire, Fla., to join several other prominent Cleveland coal men now sojourning in that section, among them being **A. A. Augustus**, president of the Cambridge Collieries Co., and **Charles E. Maurer**, president of the Glens Run Coal Co.

Papers have been filed with the secretary of state increasing the capital of the **Brown Coal Mining Co.**, New Philadelphia, from $40,000 to $100,000.

The Ohio Mining Co., and twenty-two others in the Hocking Valley district have filed a complaint with the Ohio Utilities commission against the rates charged for electrical current by the Hocking Power Co., The Athens Electric Co., and the Southern Ohio Power Co. The complaints aver that the rates are now at the high point during the war emergency. The companies making the complaint represent a production of 13,950 tons daily.

The Colonial Fuel Co., Columbus, has been chartered with a capital of $25,000 to operate a retail coal business. Incorporators are W. H. Plant, E. E. Plant, L. W. Cargill, L. H. Recob and I. N. Gardner.

In the suit of the **Emmons Coal Mining Co.**, against Herman Everett doing business as the **Western Coal Co.**, Judge John Weld Peck of the United States District Court at Cincinnati has entered a judgment of $14,270 against the Western company. Notice has been given that the case will be carried up to the Circuit Court of Appeals. The decision was based on the non-delivery of coal under contract.

George F. Stahmer, president **Quin Morton** and **H. M. Hall**, vice-presidents, were in Cincinnati recently on business matters at the branch office of the Ft. Dearborn Coal Co., from their homes in Chicago and Charlestown.

J. C. Layne has again taken charge of coal sales for the Eaton Rhodes Co., Cincinnati. **F. P. Colville**, who had charge of the Ashland office of the company is on an indefinite leave of absence. This is in accordance with recent changes which took place in the selling end of this corporation.

Darby Brown, president and general manager of the N. N. Brown Co., Birmingham, accompanied by **George Smith**, his Georgia and South Carolina representative, was a recent visitor to the Cincinnati market.

PENNSYLVANIA

The Schuylkill County commissioners have engaged **W. H. Munroe**, Lackawanna County, to head the work of a revision of the assessment of coal lands of Schuylkill County. The commissioners have determined to increase the tax valuation of the holdings of the coal companies by several hundred millions of dollars, and the engineers working under Munroe will determine the exact amount.

D. E. Ruckman, formerly with the Lake City Coal Co., Cleveland, has recently become connected with the Coal Land Development Corporation, of Pittsburgh.

The engineer of a mine locomotive was killed and two men were injured at the Cranberry colliery of the **Cranberry Creek Coal Co.**, Hazelton, when a locomotive plunged from a trestle 25 feet to a sulphur creek below.

Recent state charters issued at Harrisburg include: **Parkers Landing Coal Co.**, mining and preparing coal, capital stock $50,000; treasurer, Guiseppi Caputo, Pittsburgh. Incorporators: Joseph Pecoraro, Rosario Mineo and Ciacinto Mineo, Parkers Landing. **Marvel & Marvel**, mining, buying and selling coal and coke, Pittsburgh; capital, $25,000, Herbert M. Marvell, Pittsburgh. Incorporators: Herbert M. Marvell, Charles C. Marvel, Syracuse, N. Y. and W. Russell Carr, Uniontown. **Puritan Coal Co.**, mining and selling coal, Mount Union; capital, $30,000; treasurer, O. J. Cassady, Mount Union; incorporators: J. Ward Putt, Huntington; O. J. Cassady and David Caldwell, Mount Union. **Interstate Coal & Coke Co.**, mining coal, manufacturing coke and byproducts, Pittsburgh, capital, $25,000; treasurer H. S. Lewis, Pittsburgh. Incorporators: H. S. Lewis, John Robinson, Jr., and A. M. Oliver, Pittsburgh.

A charter has been issued to the **Anthracite Dredging Co.**, Philadelphia, which will dig and dredge coal. It has a capital stock of $200,000 and R. E. Patterson is the treasurer. He with P. Jansen and A. E. Messman incorporated the company.

J. C. Cosgrove, Johnstown coal operator, left recently accompanied by a party of New York bankers for Shreveport, La. The party is making an inspection of the properties of the Invincible Coal Co. and the Louisiana Coal Co. From Shreveport the party is going to Houston, Tex., where the refineries of the Lousiana Oil Co. are located. This company's holdings are producing 25,000 bbl. of oil daily. H. J. Meehan, a member of the Cosgrove company, was recently elected a director of the Lousiana Oil Co. He is accompanying the party.

Mine inspectors and company representatives conferred with Chief Button, of the State Department of Mines, in Wilkes-Barre recently, to discuss methods of extinguishing the fire in the **Red Ash Mine**. The mine was visited, but no decision was reached, though several new methods were proposed. There will be another meeting in March. The fire began in December, 1916, and up to date both flooding and sealing have proved ineffectual, so that there is danger to adjoining properties.

TENNESSEE

Headed by former Governor Harding of Iowa, a syndicate has purchased 13,000 acres of coal land near Pikesville, under the name of **Pocahontas & Sewanee Coal Co.** Members are: Gail Borden, New York; C. J. Kurtz, Chicago; Paul F. Beick, Bloomington; Dr. V. M. Price, Buffalo; J. J. Pitts, Bloomington; C. W. Walker, an Alabama operator and J. O. Kirkpatrick, Pittsburgh operator.

The La Follette Coal & Iron Co., is contemplating the erection of a byproduct coke plant to use 12,000 to 15,000 tons of coal a month. In case the ovens are built most of the coke will be used in the La Follette blast furnace and the gas probably used in a power plant to furnish electric power to local industries and the adjoining coal mines.

UTAH

The U. S. Land Office in Salt Lake City has decided in favor of the State of Utah in the case in which Cyrus W. Shores contested the right of the State to select as school land a tract described as the southeast corner of Section 36, Township 12 south, Range 9 east, comprising 160 acres. Mr. Shores held that the land was known to contain coal deposits when it was selected by the State. The State introduced evidence that coal was discovered later. Intervenors in the action were the **Ketchum Coal Co.**, and the **Pleasant Valley Coal Co.**, who purchased the property from the State. The contest was originally filed in 1915. Action on the case had been delayed pending a decision in the Sweet case, then before the Supreme Court.

The prompt action of the Spring Canyon Mine Rescue Association's station prevented what was likely to have proved a disastrous mine fire. The trouble occurred in the mine of the **Carbon Fuel Co.**, at Rains, and was attributed to a gas feeder which is believed to have been set alight by a powder explosion or by electric wires becoming short circuited. According to the report the fire had been in progress behind a screen of smoke some hours before its true nature was determined. No one was hurt although some of the men had narrow escapes.

VIRGINIA

C. L. Massel, manager of the Norfolk office of the Eastern Coal & Export Corporation, has been in Richmond on a business trip.

The Lambert's Point Coal Exchange was dissolved Feb. 15, and the Norfolk & Western will continue to operate as usual, except that coal will be consigned to special dealers instead of to the pools.

Petition of twenty-one shippers using the **Lambert's Point Coal Exchange**, for injunction to prevent the railroad collecting $500,000 in demurrage charges until the Interstate Commerce Commission has passed on the manner in which these charges were fixed, has been taken under advisement by Judge A. R. Hanckel, of the Circuit Court. The shippers will ask, if it is found that the demurrage charges have been properly fixed, that the Interstate Commerce Commission change the tariffs of the railroad.

WASHINGTON, D. C.

The Comptroller General has declined to reverse his former decision of Sept. 21, 1921, in which he refused to allow a claim of $62,154 by the **Coast Coaling & Engineering Co.**, for coaling vessels at New York under Navy contract in 1918. He says no new evidence has been adduced to justify reversing the former decision.

The Treasury Department asks $3,000 additional for fuel for the balance of the year. The 1921 estimate called for $31,844 for coal at $10 a ton. For this year it was reduced to $8 a ton and the $3,000 is requested in addition to the $25,000 previously appropriated.

On behalf of retail coal interests, Roderick Stephens of New York, president of the National Retail Coal Merchants' Association, concluded on Feb. 15, before the House Committee on Mines and Mining, his opposition to the further continuance of the government in the fuel business in the Capital through its agency, the Government Fuel Yards under the Bureau of Mines which supplies government departments in that city with fuel. Mr. Stephens argued that it was not proper for the government to compete with local coal dealers and that this intrusion cost the local dealers considerable revenue. He said that the fuel yards were established as a war emergency and the business should revert to local dealers who had satisfactorily served the government in former times. Director Bain of the bureau argued that the government was assured of a regular supply of coal through the fuel yards and that it obtained more favorable prices through its ability to contract for large quantities at the mines.

WEST VIRGINIA

It has been possible to resume operations at the plant of the **Shamrock Fuel Co.**, in Monongalia County, after a suspension of operations covering an extended period. An interesting point has been raised in connection with the suit in the circuit court of Monongalia County of the **Wilson Brothers Coal Co.**, of Pennsylvania, against the **Davis Coal Co.**, of Morgantown, and that point is whether it is necessary that a plaintiff company having a contract to furnish so much coal shall actually mine that coal and load it on cars and make a tender of the coal before there is a violation or breach of contract. In this particular case, the plaintiff company is seeking to collect from the defendant for more than 22,000 tons at $10 a ton, the plaintiff alleging that the defendant declined to accept any more coal on its contract after the bottom dropped out of the market. It is the contention of the defendant that the plaintiff had not attempted to deliver the coal which was to have been delivered on the cars at the mine according to the contract. He declared that the plaintiff could not charge failure on the part of the defendant to accept the coal because it had not mined the coal and had not delivered it on the tracks in cars, as stipulated in the contract.

Arrangements are being made by the **Eastern Coal Mining Co.**, for increasing the capacity of its mine in Preston County by the installation of additional equipment including cutting machines and screening apparatus.

Under a recent change in the assignment of district mine inspectors, **William Moore** of District 15, with headquarters at Beckley, will have supervision over the Winding Gulf up to and including Helen, all mines around Beckley and down Piney up to and including Lanark. **M. E. Quenon**, with headquarters at Mullens, will have supervision over the mines from Metalton on the main line of the Virginian, all the mines in Wyoming County being included, and will also have supervision over the mines on the Winding Gulf as far as Mullens. His territory takes in everything including the mines up the Gulf including Amigo, everything on Stone Coal Branch, ending with Princewick. **J. E. Hamilton**, of District 11 with headquarters at Eskdale, has supervision over all of the high-volatile mines in Raleigh County.

The principal office of the following corporations has been changed as indicated: **Birch Fork Coal Co.**, from Beckley, to Charleston; **Manhasset Coal Co.**, from Charleston, to New York; **Bailey Fuel Co.**, from Charleston, to Toler, Ky.; **Sudduth Fuel Co.**, from Charleston, to Stone, Ky.

The following West Virginia coal corporations have dissolved and gone out of business: **Fred Mullens Coal & Coke Co.**; **Triangle Coal Co.**, **Glady Creek Coal & Coke Co.**; **Marrowbone Coal Co.**; **Eagle Collieries Co.**; **Letcher Coal & Coke Co.**, the last named being dissolved by deed of sale.

Coincident with the purchase by the Consolidation Coal Co. of the property and mines of the Carter Coal Co. in Virginia, West Virginia and Kentucky, announcement was made of the appointment of **F. K. Day**, who has been district superintendent of the Clarksburg district in which capacity he was also the personal representative of the general manager, as general manager of the new division of the company necessitated by the acquisition of the Carter company. Mr. Day has been connected with the company for the last fourteen years, having first become identified with it as a member of the engineer corps in the Maryland and Pennsylvania divisions.

T. H. Wickham, who is identified with several of the important mining companies in Raleigh County, has departed for a cruise of the Mediterranean and a tour of southern Europe, expecting to be absent from his office for a period of two months. With him on the trip was Mrs. Wickham.

Alleging mismanagement of the affairs of the **Barbara Mining Co.**, William D. Woodruff, of Pittsburgh, principal stockholder of the company, succeeded early in February in having the circuit court of Monongalia County appoint receivers for the company and issue a restraining order to prevent creditors of the company from interfering with the property. The court, upon agreement between counsel for opposing sides named James H. McGrew and Millard F. Sisler as receivers, a bond of $5,000 being executed. It is recited in Mr. Woodruff's bill of complaint that the stock of the company is held as follows: Woodruff Coal & Iron Co., 676 shares; Charles E. Craig, 50 shares; R. H. Jamison, 5 shares; Francis R. Woodruff, 5 shares; George J. Meehan, 1 share; A. M. Davis, 5 shares; and William W. Woodruff, 1,312 shares. The management of the property had been left to an engineer under whose management the affairs of the company became so involved that it cannot pay its obligations. The plaintiff contends that if the property were put up at a forced sale it would involve a sacrifice of the holdings of the stockholders.

There has been acquired by **F. B. Strickler** of Kingwood, a tract of 250 acres of Bakertown coal in Preston County, which the purchaser is planning to develop in the near future or at such a time as market conditions justify it. This coal will probably be taken out through the **Mary Mine**, already in operation.

Improvements long contemplated by the **Slab Fork Coal Co.** are to be made in the near future. All arrangements have been made for the construction of a steel tipple at Slab Fork, to be completely equipped in every respect. W. Gasten Caperton is general manager and the improvements will be made under his direction.

Announcement has been made by the Consolidation Coal Co. of the appointment of **Walter J. Davis** as superintendent of Mine 86 of the Consolidation company at Baxter and Mine 97 at Rivesville. Mr. Davis succeeds **Charles E. Potter**, resigned. Mr. Davis' entire mine career has been with the Consolidation company.

A. C. Finley, superintendent of the Gilmer plant of the Davis Colliery Co. was a recent visitor at the general offices of the company in Elkins.

Both **W. L. Zinn** and **L. E. Albright**, who operate mines at Reedsville, have been elected members of the city council of Morgantown, W. Va.

Statement was recently made by the **West Virginia-Pittsburgh Coal Co.**, a large concern operating mines in Brooke County, of its intention to operate its various mines as it saw fit and without reference to attempted control by any outside organization. This company has heretofore operated its mines under an agreement with the United Mine Workers but states that it is no longer able to do so and at the same time meet competition.

ONTARIO

S. B. Coolidge, vice-president of the Clarkson Coal & Dock Co., Cleveland, was a recent caller on the coal trade in Toronto.

M. A. Conrad, manager of the Pittsburg office of the F. A. Fish Co., Ltd., Toronto, spent a few days at the head office of the company in Toronto recently.

H. A. Harrington, of the Coal Exchange of Canada, has issued a statement setting forth the possible effects of the threatened strike of United States miners. If the strike is long continued he claims that the people of Ontario, are likely to suffer next winter. Dealing with the consumption of coal this winter, Mr. Harrington states that in the smaller communities consumption has been above that of last year and on March 31 stocks on hand will not exceed one week's supply.

Trade Literature

Morrow Shaking Screens.—The Morrow Mfg. Co., Wellston, Ohio. Pp. 32; 8½ x 11 in.; illustrated. A description of the plant wherein the Morrow Mfg. Co. has installed the equipment.—Advertiser.

The Montgomery Coal Washer.—Montgomery Coal Washing & Mfg. Co., Birmingham, Ala. Book 43. Pp. 23; 6 x 9 in.; illustrated. Description of the Montgomery jigs, with analyses of washed and unwashed coal.

Chart Classifying Mine Gases—Hughes Brothers, 414 W. 9th Ave., Scranton, Pa.—Advertiser.

Lightning Arresters — Bulletin No. 183, Electric Service Supplies Co., Philadelphia. Contains 62 pages of material describing "Keystone" Expulsion Type and "Garton-Daniels" Lightning Arrester for central station, line, transformer, railway and mine protection.

Self-Cleaning Attachment for Carbide Lamps—Jacobson & Turja, Hancock, Mich.

Traffic News

The Ohio Utilities Commission has issued an order requiring the Hocking Valley Railway Co., to reduce its rates on short-haul car lots of coal shipped from the Hocking Valley district to nearby points. The reduction is from 84c. to 57c. for haul of ten miles or less; and all above eleven miles to 67c. Former rates were held to be excessive and unreasonable.

Purchasers of the **Tennessee Central Ry.** are said to be considering favorably the possibility of extending the western division of the road from Hopkinsville, Ky., to Paducah, a distance of seventy miles, to connect with the Burlington.

In the complaint of the **Beaumont Chamber of Commerce** an examiner recommends that a car of coke shipped in 1919 from Chaison, Tex., to Lake Charles, La., was misrouted and awards the complainant reparation because of overcharges.

A request has been made to publish specific rates on bituminous coal, carloads, from all producing districts, to Dearborn, Mich., on the same basis as at present are published to Inkster, Mich., Dearborn, Mich. being eliminated from Detroit Switching District, effective Dec. 15, 1921.

The Ohio Utilities Commission has ordered that the hearing on the question of the reasonableness of coal freight rates on intrastate shipments shall be started Feb. 28. The hearing was requested recently by Governor Harry L. Davis, who desires to stimulate coal production in the Buckeye State. All Ohio roads have been notified of the date and asked to be ready to present their side of the question.

In the complaint of the **George B. Newton Coal Co.**, an I. C. C. examiner recommends that charges for the movement from Angora to Paschal and 52nd Sts., points in Philadelphia, of certain carloads of anthracite originating in Pennsylvania mines, were illegal.

In the complaint of the **Hood Coal Co.**, an examiner recommends that in connection with the transportation of coal from mines between Shinnston and Bingham Junction, W. Va., to points in other states, the Monongahela Power & Ry. Co., an electric line, is a common carrier subject to the commerce act, and that the present carload combination rates are not unreasonable or unlawful, and joint rates refused.

The Indiana State Farm, of Putnamville, Ind., complains against unreasonable rates on 42 cars of coal from Seelyville, Ind., to Putnamville.

In the complaint of the **Oxford Paper Co.**, the I. C. C. decides that the rates on bituminous and small sizes of anthracite from points in Pennsylvania and from Fairmont, W. Va., to Rumford and South Brewer, Me., are unreasonable.

The United Paperboard Co., of New York, has complained to the I. C. C. against alleged unreasonable rates on anthracite from Delaware & Hudson mines in Pennsylvania to Thomson, N. Y.

The Hamill Coal & Coke Co., and others, of Blaine, W. Va., in a complaint to the I. C. C. allege unreasonable rates on coal from points in Maryland to points in West Virginia, Virgina, District of Columbia, Ohio, Indiana, Illinois, Pennsylvania, New York, Delaware, New Jersey, Connecticut, Rhode Island, Massachusetts and other States and to Canadian points. The complaint requests establishment of joint through rates on the Cumberland-Piedmont and Myersdale group basis in lieu of the present combination rates.

Request is being made for the application of same rates on bituminous coal, carloads, from mines on the D. T. & I. R.R., in Ironton, Ohio, District, as apply from mines on the D. T. & I. R.R., in the Jackson County, Ohio, District, to all points to which rates are now published by D. T. & I. R.R. in Agent Davis' Tariff I. C. C. 811.

The Lion Coal Co., Ogden, Utah, has filed suit against the O. S. L. Ry. for $932.76, alleged freight overcharges on slack coal shipped over a year ago. It is alleged that $2.40 per ton was charged and that the correct rate should have been but $1.80.

Association Activities

Clarksburg Coal Club

Not only questions of local interest but of general interest as well were touched upon at the meeting of the Clarksburg Coal Club held a short time ago. A feature of the meeting was the attendance of many oue-of-town operators. General conditions were discussed by James Williamson of the **Maryland Coal Co.** T. J. Parrish, who in addition to being an operator is also a member of the council of the City of Clarksburg discussed conditions in the Clarksburg field. President A. Lisle White, of the Northern West Virginia Association told of the meeting of the National Coal Association in New York during the second week of February.

Obituary

John O'Reilly, formerly a well-known business man in Toronto where he was branch manager for P. Burns & Co., wholesale coal dealers, died a few days ago in Buffalo. The remains were interred in Toronto.

Alexander C. Waldie, a well-known coal dealer in Toronto died at his home in that city recently. At an early age he joined the staff of C. J. Smith & Co., coal dealers and when the Standard Fuel Co. was founded, the C. J. Smith Co., was united with it and Mr. Waldie was appointed to a responsible position with the new organization. He was with the Standard company for 34 years.

Coming Meetings

New England Coal Dealers' Association will hold its annual meeting March 22 and 23 at Springfield, Mass. President, W. A. Clark, Milk St., Boston, Mass.

Northwestern Pennsylvania Coal Operators' Association will hold its annual meeting Tuesday, March 7, at the Wm. Penn Hotel, Pittsburgh, Pa. Secretary, T. F. Diefenderfer, Butler, Pa.

Tri-State Coal Stripping Association's annual meeting will be held March 2 at Wheeling, W. Va. Secretary, G. A. Blackford, Wheeling.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

Canadian Institute of Mining and Metallurgy will hold its annual meeting March 1, 2 and 3 at Ottawa, Canada. Secretary, G. C. Mackenzie, Drummond Building, Montreal, Quebec, Canada.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Upper Potomac Coal Association will hold its annual meeting March 6 at Cumberland Md. Secretary, J. F. Palmer, Cumberland, Md.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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Collective Bargaining Not in Danger

HAVE the bituminous coal operators abandoned collective bargaining? The United Mine Workers are telling the public that unless the coal producers in the Central Competitive Field meet with them in joint conference in an effort to agree on a scale of wages for the next year or two years, collective bargaining will have been discarded by the owners. The miners profess to desire a conference but they have set up an impossible set of "demands," of which the most notorious is the six-hour day and five-day week. The miners have declared themselves against any wage reduction. Subject to a referendum they have gone on record in favor of a strike if their demands have not been met by April 1.

What is collective bargaining? Certainly not what the miners propose, a form which has been aptly characterized as "collective threatening." Each and every group—southern Ohio, eastern Ohio, Pittsburgh, Illinois and Indiana—has in turn stated its willingness to meet collectively the representatives of their men, the officials of the United Mine Workers. This is no sudden onslaught against the miners' International union. It is a condition brought on by the men themselves, for it will be remembered that in the summer of 1920 they refused to abide by the decision of the President's Bituminous Coal Commission when they struck for advances in wages over those given them by that commission. After a series of local strikes the President on Aug. 10 asked the operators and men to get together and make whatever adjustments were necessary. A meeting of the Central field producers and the union officials was held in Cleveland, at which no decision was reached and following which, on Aug. 19, John L. Lewis, president of the United Mine Workers, telegraphed President Wilson announcing that they had not been able to reach an interstate settlement, but that "While this circumstance may be regarded as unfortunate, I am of the opinion that there is no necessity for any public apprehension. There are reasonable grounds for the belief that the questions at issue between the operators and miners may yet be harmonized through the instrumentality of agreements which may be consummated in the individual coal-producing districts without inconvenience to the public."

These words exhibit no grief over the lack of decision from the Central Competitive Field. Mr. Lewis did not at that time say that the operators were refusing to bargain collectively, because he had in prospect the increase in wages that the men were demanding. He was quite willing to go back to the separate fields then because that was a way to get what he wanted. There is an old saying about "The Devil was sick, the Devil a monk would be," etc.

Nor does the break-up of the Central Competitive Field—for there will be no interstate conference this year—spell ruin to the miners' union, although it will remove it as a large menace to the peace and prosperity of the coal industry. There always have been the outlying fields with which the union has dealt, and now all will be outlying fields. The Illinois operators state that they "for the past three months have stood ready to negotiate a wage scale with their own workmen." They do not believe, however, "that the growing tendency of organized labor, not only in coal but in many other industries, to negotiate in increasingly larger groups has justified itself." In other words, since the United Mine Workers has followed the blind policy of standing in the way of economic readjustment and deflation, it is necessary that the employers refuse recognition of the traditional power of that organization and work out the required downward readjustments piecemeal.

No, it is not collective bargaining that is in danger; it is the jobs of such as Lewis, Brophy, Howat and Farrington. They had the choice in 1912 of meeting with the operators to discuss a reduction in advance of contract termination, just as the operators had met them the previous year when they wanted more wages, but the union stood pat, and now prepares to stand patter still. The officials of the union undoubtedly felt that they would be fired if they should recommend a reduction, and now they will have to go because they did not do it and have not the courage to say the time has come.

If the bituminous coal operators do not now effectively clean house in the miners' union by refusing the check-off, they will have missed the chance of a lifetime.

Smoothing the Bumps in Demand

BUSINESS cycles are not mystic symbols of an occult science. Business has its ups and downs—always has had—but not necessarily must it always have them. So far, what we have done as a people is to stand by and record the passing of the cycles—the periods of prosperity, inflation, the burst of the bubble, depression and deflation and the painful return to good times.

Coal has felt these ups and downs, has suffered the full shock of every bump. Therefore coal is interested in the prospect of leveling the tops off the peaks of demand, in order to fill the valleys of extremely low demand.

It is true that one must look outside the coal trade for causes contributing to major business fluctuations, for the coal industry is affected by but does not cause such variations. Possibly no other industry is so strongly influenced by depression and abounding prosperity as bituminous coal. Producers of bituminous coal are the most cheerful optimists in this country, as they live in continual hope of peak demand, for in ordinary times there are so many of them that there is no profit save for the exceptional few. Were the hope of temporary abnormal market and profit taken away and in its stead established a more nearly continuous rate of demand, the fittest who survived would have the field and mushroom growths be eliminated.

Such a condition would approach the unattainable ideal, but a Special Committee of the President's Conference on Unemployment was last week appointed and has already launched into a study of the fundamentals of unemployment and the control of the business cycle. The committee is to make a report in six months. Owen D. Young, vice-president of the General Electric Co., New York, was named chairman; Joseph H. Defrees, president of the Chamber of Commerce of the United States; Clarence Mott Woolley, president of the American Radiator Co., New York; Matthew Woll, vice-president of the American Federation of Labor, and Miss Mary Van Kleeck, Russell Sage Foundation, New York, are the other members of the committee. Edward Eyre Hunt, secretary of the President's Conference on Unemployment, was appointed secretary of the new committee, and Wesley C. Mitchell, of New York, field director of the study.

In this connection it is proper to note that Senator Kenyon had a business-cycle bill before Congress and it provoked so much adverse comment that he permitted it to go back to the committee, where it will sleep. The Senator proposed in his bill to regulate not private business but public expenditures in a way to supplement private work, taking, in other words, government expenditures off the peak and putting them in the valleys. But Congress is very jealous of its prerogative to indicate when and where expenditures of public funds are to be made, and refuses to vest even limited control over these funds in the Executive, as provided by Senator Kenyon's bill.

Senator Kenyon believes the President would handle the matter with sufficient judgment to prevent any of the dire results prophesied by opponents of the bill. He pointed out that Canada has gone much further than this bill proposes. The French Government attaches enough importance to the matter to maintain a commission for the regulation of public works in relation to employment in other industries. Even before the war Great Britain had a highway fund which was to be expended during periods of unemployment only. Since the war Great Britain has greatly expanded this policy. The Belgian Government has what is known as a national crisis fund, to be expended on public works during periods of unemployment. Switzerland has a traditional policy of subsidizing local public works. These and other examples were cited by the Iowa Senator in support of his bill, but, despite the admitted strength of his arguments, little sympathy for the proposal was aroused and it is admitted that a different type of proposition must be evolved before there is any hope of obtaining legislation of this character.

It is understood that the administration was behind the Kenyon bill and now that it stands defeated has not dropped the subject but seeks education of Congress and the public, such as will come from the study of this special committee on control of business cycles, before pushing harder for national legislation.

WHEN LAST SEEN business was still turning the corner."—*Brookville Record.*

SPRING IS NOW only about four tons away.—*Gloversville Leader-Republican.*

Advocacy of Triple Shift

IN DISCUSSING Mr. Ashmead's paper on the possible advantages of the multiple shift Mr. Kniffin found two conditions under which it might succeed. He stated that metal mills were divided into units and that a three-unit mill would require three times as many men as a one-unit mill and put out three times the product. He declared that each unit was entirely self-contained, the men in one unit not working on the machines in another unit. It would seem that Mr. Kniffin should be conversant with the facts, having been a metal-mining engineer at a property adjoining the Santa Rita copper field.

But it would nevertheless seem pertinent to point out that the men in one unit often, if not generally, work in all the units. Thus all the ball mills in all the units may be placed under a ball-mill man and his helper, even when there are sixty or more ball mills. The reasons for this are obvious. The work being similar the man becomes an expert. The ball-mill attendant should not have charge of crushers, concentrating tables, vanners, flotation equipment, thickeners or filters. Furthermore, as all the ball mills are on one level they can be better attended by the men on that level than by someone moving up and down between the machines at different elevations in any one unit. It is easier to travel on a level than to run up and down stairways.

It might also be pointed out that the unit arrangement applies to only certain classes of machinery. The roughing rolls and the filters may serve all the units or a large number of them—perhaps twenty—and one building covers them all and is served by one or two cranes. In consequence a twenty-unit mill is cheaper to build per unit than one that has only one unit. And, for the reasons mentioned, it also is cheaper to run. What is true of a mill is equally or even more true of a preparator for anthracite. Why should there be a No. 1 crusher to each unit or a separate thickener? The fact is the unit principle is carried as far as it is profitable in mills, and it should be used in the preparator in just the same way. Mr. Kniffin would surely follow this same rule.

Another point Mr. Kniffin makes is that in abandoning all mines but one a saving will be made, for the best mine will be taken, and, we may add, the one most convenient to the preparator. This is good counsel. It is true that many anthracite mines are too much spread. There is a lack of concentration at some plants, but we fear that those who fail to recognize that now would fail to observe it if triple or double shift were introduced. It is difficult to induce any operator to believe that the expedient of boarding up a mine that is remote and uneconomical would make for improved results and would lessen depreciation.

It is hard to believe that with conditions as they are in the anthracite region it would be possible to work places three shifts without losing more than is gained. If the mine is to be made large so that the triple shift can be obtained with single-shift operation at each working face, then why not make it thus large and work single shift?

The answer to this is, perhaps, that the shaft and the haulageways are the neck of the bottle, and in some cases that is indeed true, but in most cases it would be better to modify these than to try to gain the tonnage by the objectionable triple shift, which gives best results with daymen and not contract workers.

Means Taken to Make Safe and Efficient the Direct and Alternating Current at a Southern Illinois Mine

Copper Returns for Current—Should Underground Transformers Fire, Station Door Closes and Cuts Off Current—Each Half of Mine Can Be Run Electrically Separate and, if Desired, Both Sides from One Machine

By A. S. White*
St. Louis, Mo.

THE Kathleen Mine of the Union Colliery Co., located at Dowell, in Jackson County, Illinois, is electrically operated throughout. Power from a 3-phase 60-cycle high-tension commercial circuit is received at the mine substation at 33,000 volts and is there stepped down to 2,300 volts for distribution to the mine power station, the man-and-material hoist, the main hoist and to the underground alternating-current circuit. Underground haulage is necessarily performed by direct current; that used for all other underground power requirements is alternating.

Trolley circuits within the mine are energized by a 200-kw. Westinghouse motor-generator set and a 200-kw. Westinghouse rotary converter. These machines operate in parallel and deliver direct current at a bus potential of 275 volts. These machines, despite their differing characteristics, work well together, but the extreme variations in the primary voltage of the current as delivered from the power lines occasions some difficulty. To overcome this irregularity automatic voltage regulators will be installed, thereby insuring a uniform potential at all times.

The north and south sides of the mine are capable of complete segregation, sectional switches being placed in the trolley line wherever connections occur. This arrangement permits of the operation of at least one side of the mine while repairs are being made to either of the generating units. On idle days, however, the entire mine is supplied from one of the two machines.

ADEQUATE POSITIVE AND NEGATIVE LINES

Main- and butt-entry trolley circuits are of 0000 wire, grooved or of figure-8 section. Panel entries are strung with 00 wire and sectional switches are placed in the circuits at the beginning of each butt- or panel-entry line. Positive feeders, consisting of double lines of 0000 triple braid-covered conductors, are carried on insulators along the rib in the main haulageways to certain points inside, the exact locations of which were determined by exhaustive voltage tests.

The two conductors are connected every 500 ft. and are tied into the trolley line every 1,000 ft. Negative feeder lines of 0000 bare trolley wire, paralleling the course of the positive feeders, are buried in the haulage road. These feeders are tied into both rails of the track every 500 ft. with arc-welded stranded flexible copper bonds. Both lines of rails on main- and butt-entry haulage roads are bonded throughout their entire length by similar connectors, with cross bonds placed every 200 ft.

Referring now to the alternating-current circuit, 3-phase 60-cycle power at 2,300 volts is delivered into the mine through a General Electric type FK-2 oil circuit breaker equipped with current transformers, inverse time-limit overload relay, overload trip coils and undervoltage release. This breaker is located in the mine power station. The mine circuit divides near the auxiliary shaft bottom into north and south branches, each of which is separately protected by a General Electric type GK-20 oil circuit breaker with overload series trip coils and undervoltage release. Transformer stations located inside and convenient to the working panels step the potential down to 240 volts for secondary transmission.

Armored "Kerite" cable is used for permanent and lead-covered cable for semi-permanent or temporary installation. Where the cables pass through back entries they are carried in trenches and covered to a depth of 1 ft. Wherever it is necessary that they cross traveling ways or haulage roads they are located in conduits made with concrete walls not less than 6 in. thick. To facilitate recovery and prevent accidental contact with buried cable during subsequent grading or mining work, a "wire map" has been prepared showing the location of all mine circuits. Use of high-tension lines not conforming to these standards is not permitted anywhere in the mine.

MAKING THE UNDERGROUND TRANSFORMER SAFER

At inside transformer stations the 2,300-volt cable is carried through a tile in a trench to the interior of a vault. Leads from the cable are here connected through a General Electric type FK-20 oil circuit breaker to a bank of three 25-kva. transformers. The undervoltage release element has been eliminated from this breaker, so that it is not necessary to close the circuit after every interruption to the supply service. The trip coils are set to interrupt current at an overload of 100 per cent, the time delay at a minimum providing for an almost instantaneous break.

A standard underground station has been developed that is somewhat in advance of those at most collieries. Transformers underground have long been considered sources of fire hazard and the possibility of accident to workmen from contact with the high-tension circuit around improperly protected stations is too well known to require comment. Therefore, effort has been made here to construct a station that would reduce the possibility of accidental contact to a minimum, provide for the automatic and positive cutting out of the primary circuit to the transformer in case of overload, fire or explosion in the vault, and confine to the vault itself any fire that might possibly start. Fig. 1 shows the constructional features and arrangement of such a station.

The walls and roof of this vault are fireproof. The floor is covered to a depth of 6 in. with sand and fine gravel. This provides absorption for oil in case of accident to the transformer shell and prevents the formation of a pool of this liquid.

An iron door is suspended from the top by strap

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*Union Colliery Co.

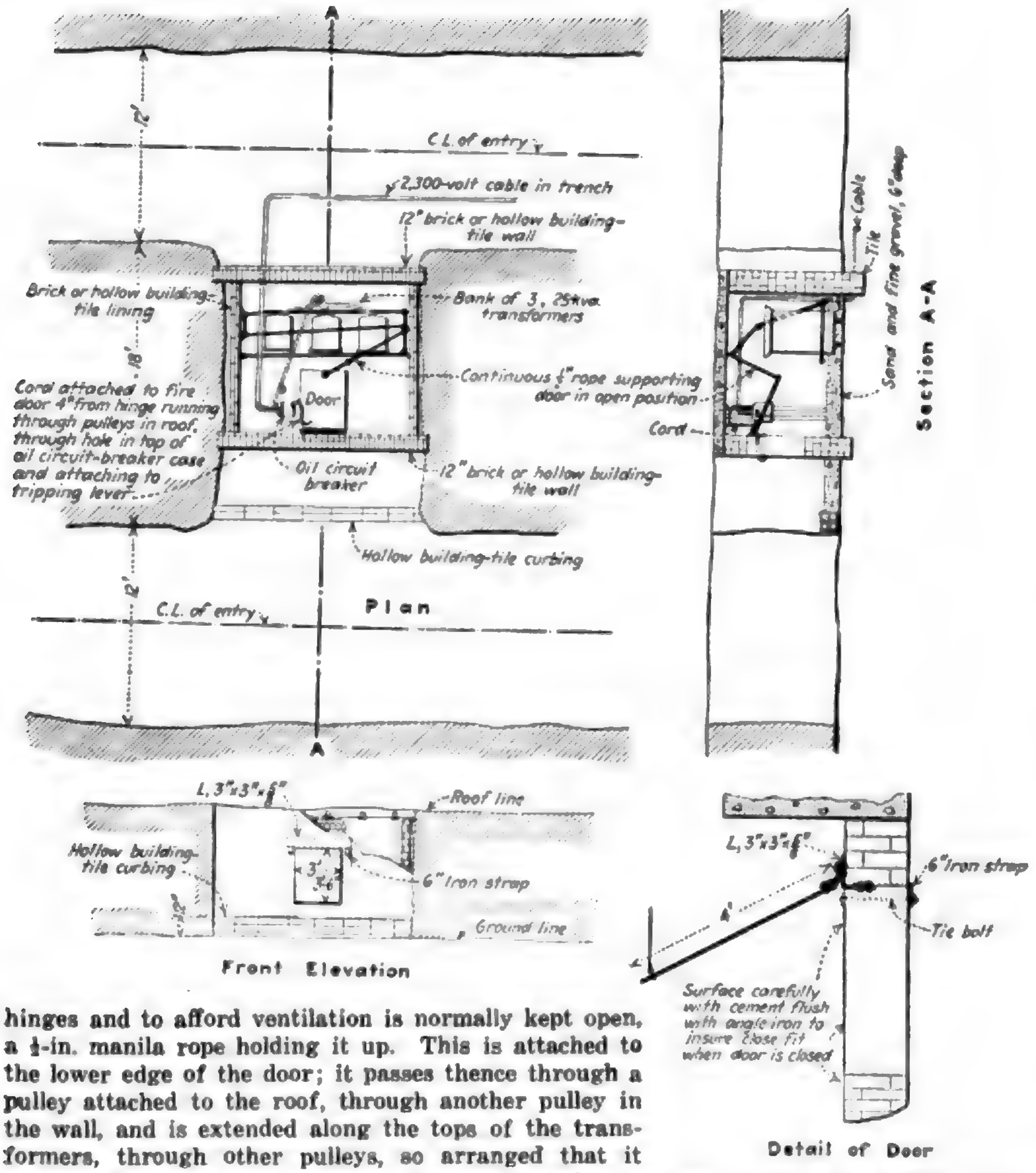

A
12'
C.L. of entry
2,300-volt cable in trench
12" brick or hollow building-tile wall
Brick or hollow building-tile lining
Bank of 3, 25kva. transformers
18'
Cord attached to fire door 4" from hinge running through pulleys in roof, through hole in top of oil circuit-breaker case and attaching to tripping lever
Door
Continuous ½" rope supporting door in open position
Oil circuit breaker
12" brick or hollow building-tile wall
Hollow building-tile curbing
12'
C.L. of entry
Plan
A
Cable
Tile
Sand and fine gravel, 6" deep
Section A-A
Cord
L, 3"x3"x⅜"
Roof line
Hollow building-tile curbing
3'
5'6"
6" iron strap
Ground line
Front Elevation
L, 3"x3"x⅜"
6" iron strap
Tie bolt
4'
Surface carefully with cement flush with angle iron to insure close fit when door is closed
Detail of Door

FIG. 1

Detail of Transformer Station

Risk that the transformers may catch fire or explode has caused the Union Colliery Co. to place them in a fireproof vault of brick or building tile, entered by an iron door. For the absorption of oil, should any escape through accident to the transformer shell, the floor of the vault is covered by sand 6 in. deep. The door is normally open, so as to keep the vault cool, but it is kept in that position by a rope so placed that should the transformers catch fire it would burn, releasing the door and allowing it to close tight. The 2,300-volt cable enters the transformer room through a covered trench. In order to protect still further against the possible formation of oil pools a hollow building-tile curbing is built in front of the vault, and a 6-in. bed of sand is used between the vault and the curb.

hinges and to afford ventilation is normally kept open, a ½-in. manila rope holding it up. This is attached to the lower edge of the door; it passes thence through a pulley attached to the roof, through another pulley in the wall, and is extended along the tops of the transformers, through other pulleys, so arranged that it encircles the transformers at their base and terminates in an eyebolt in the wall. A cord attached to the door about 4 in. from the hinge runs through pulleys in the roof, then down through a small hole in the top of the oil circuit breaker and is attached to the tripping lever.

Should a fire or explosion occur in the vault, the severance of the ½-in. rope would drop the fire door, which in turn would actuate the tripping lever in the oil circuit breaker and open the circuit. This would confine the fire to the vault and cut all power off the transformers. The frame about the fire door should be surfaced with cement, as shown in the drawing, so as to afford a tight fit when the door is closed. The oil circuit breaker which is placed just inside the door may be manually operated should occasion arise for entering the vault.

With the exception of one station of 30-kva. capacity which is located near the auxiliary shaft bottom and which supplies power to the pumps and motor-repair shop, all underground transformer stations are of 75-kva. capacity. For these stations banks of three 25-kva. transformers have proven more satisfactory than individual 3-phase units of the desired size, because of the greater ease with which the smaller units may be moved and installed underground.

Each 75-kva. bank is capable of providing ample energy for three 35-hp. mining machines, the number normally operated from each station. Larger stations supplying more machines have not proved economical, for with them the distance of secondary transmission was too great. Two 150-kva. transformers installed during the war, when difficulty was experienced in obtaining units of the desired size, have been removed and smaller units substituted.

Equipped with the 75-kva. banks, each station normally supplies three 20-room panels or their equivalent. Each bank may be so located as to be not more than 1,500 ft. from the most distant point served. Only under unusual circumstances, and then only temporarily, does the distance to the foot of a panel exceed 550 ft. Normal panels require an additional 500 ft. of conductor to reach the most distant place.

Fig. 2 illustrates a typical location of a transformer station and the arrangement of secondary circuits. A further division of transformer units (such as one to every machine) with the attendant advantage of even shorter secondary transmission was deemed inadvisable because of the expense incident to the construction of so large a number of fireproof stations as well as that of installing and subsequently recovering the greater amount of cable required.

Secondary circuits from all transformer stations are

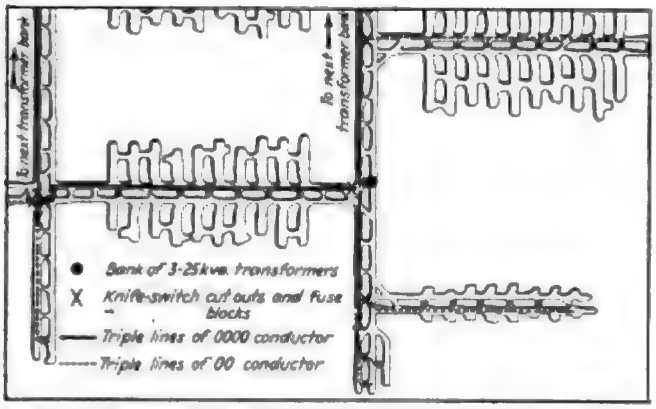

To next transformer bank
To next transformer bank
Bank of 3-25 kva. transformers
X Knife-switch cut outs and fuse blocks
Triple lines of 0000 conductor
Triple lines of 00 conductor

FIG. 2. TYPICAL LOCATION OF TRANSFORMER STATION

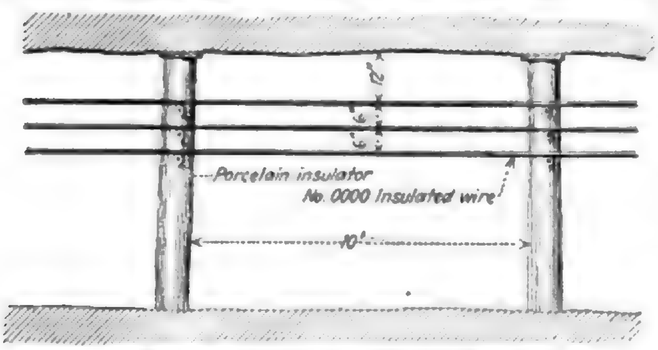
Each station is equipped with a 75-kva. bank and normally supplies three 20-room panels or their equivalent. The stations are so located as to be within 1,500 ft. of the most distant point served and not over 550 ft. from the foot of the most remote panel to be fed. Banks of larger transformers have been tried and found uneconomical.

tied together. Knife-switch cut-outs and fuse blocks are placed between each transformer bank and the secondary circuit, also between each two transformer stations on the secondary circuit. By this arrangement, in case of an accident to any transformer, it can be cut out of service and the panels normally supplied from it will be able to draw power from other stations. Under normal operating conditions with all secondary circuits tied together the load factor is improved and any peak thrown on an individual transformer bank is shared by the connected stations.

Insulated wire is used exclusively in the secondary circuit. While it is realized that insulation fails to afford complete protection against shock it is believed that at least some measure of security is attained and the probability of fatal accident is materially reduced thereby. Certainly during the time when men employed on entries are required to work in close proximity to a conductor the danger is minimized. On all secondary circuits 0000 wire is used except in panel entries, where 00 is installed.

On main and butt entries the wire is carried in the back passage on porcelain insulators fastened by lag screws to props set about 10 ft. apart. The insulators are so spaced as to give a clearance between the top wire and the roof of 12 in. and between wires of 6 in. Wherever required to pass along the roof, as in crossing over haulageways, the wire is carried on porcelain insulators fastened to the roof by lag screws sunk in drilled and plugged holes.

In panel entries the wire is carried up one heading on props set along the pillar rib, short leads through each crosscut supplying the other entry. Fuse blocks and knife-switch cutouts are introduced at the head of each panel-entry circuit.



METHOD OF STRINGING SECONDARIES

Wherever, as in crossing over haulageways, it is necessary to place the wires against the roof, they are carried on porcelain insulators fastened to the roof by lag screws sunk in drilled holes in which wood plugs have been inserted.

All gathering in this mine is done by 6-ton locomotives equipped with either mechanical or automatic electric cable reels. Main-line haulage is performed by 15-ton locomotives. With the exception of a few breast machines, used by gangs in entry work, the coal-cutting equipment consists of 35-hp. shortwall machines using a 7 ft. 6 in. cutter bar and equipped with automatic trucks and cable reels. All these gathering, hauling and cutting machines are of Goodman manufacture. As a safety measure all trucks are now being equipped with brakes.

Anthracite Section of American Mining Institute Meets in Wilkes-Barre

With Eli T. Conner, consulting mining engineer, of Scranton, in the chair, the anthracite section of the American Institute of Mining and Metallurgical Engineers met in the Westmoreland Club, Wilkes-Barre, Saturday, Feb. 4. The members discussed the paper presented by D. C. Ashmead, anthracite editor of *Coal Age*, entitled "Can Anthracite Mines Be Operated on More Than One Shift?"

Mr. Connor declared that the paper appeared to favor conclusively the negative side of the question. He did not believe in the words "It cannot be done," but he refused to say whether it would "be practicable or profitable" to work more than one shift per day, but it "seemed" to him "that anthracite engineers and managers are too resourceful to admit that they cannot do what other mining men have done and are doing."

TRANSPORTATION AND MARKETS LIMIT SHIFTS

L. M. Kniffin, development engineer of Madeira, Hill & Co., said that the limitations as to transportation and market would prevent any general increase in the number of shifts. So the possibility of general triple shifting must be dismissed. Mr. Kniffin discussed assumptions Nos. 11 and 5 in Mr. Ashmead's paper. No. 11 suggested a case where "Two of three collieries are abandoned and work is to be concentrated in one colliery, producing the same tonnage as obtained from the three, both colliery and preparator be operated on three shifts." Mr. Kniffin believed that as the colliery selected for operation by triple shifting was the most economical of the three, "it might be possible to make large savings in cost by operating the best equipment three shifts a day." The improved working conditions might overcome the disadvantage of requiring the men to change shifts. "In a group of developed properties it might prove economical to concentrate work in one mine and thus make savings in the operation of haulageways, slopes, etc. The first mine would in this case be exhausted and abandoned at an earlier date, so that maintenance expense would cease as far as it was concerned."

Assumption No. 5 called for "a new mine with a preparator to be so planned as to operate on three shifts." Mr. Kniffin said that this problem of multiple shifting is less complicated where transportation, hoisting and preparation can all be provided for on a less expensive scale, "multiple shifting being kept in mind. Under these conditions the conclusions arrived at from a study of the curves would not apply, as the new equipment, being planned for three-shift operation, would not be built to avoid the difficulties that have been pointed out." Mr. Kniffin believed that by building by units, as is the practice in the metal-mining field, it would no longer be true that "the cost of a preparator one-third the size of another will be approximately 100 per cent more per ton of output," as Mr. Ashmead has stated. Mr. Kniffin stated that "as each unit is complete in itself the construction cost of each should be about the same and a reduction in mining capacity would seem therefore a reduction in the number of units." The same condition applies to the force of men required to operate the preparator. It is the general practice for each unit to have its complete crew so that outside of superintendence a one-unit plant should require about one-third the number of men that a three-unit plant would require. On this assumption Mr. Kniffin presented Table I.

TABLE I. COMPARISON OF OPERATING COSTS FOR A STRUCTURAL-STEEL PREPARATOR

Preparator Operating Costs Excluding Labor	One Unit Producing 1,000 Tons in 8 Hours Operating 24 Hours		Three Units Each Producing 1,000 Tons in 8 Hours and Working Single Shift	
	Annual Cost	Cost per Ton	Annual Cost	Cost per Ton
Interest @ 8 %	$14,400	$0.016	$43,200	$0.048
Amortisation @ 5 %	9,000	0.010	27,000	0.030
Taxes @ 2 %	3.600	0.004	10,800	0.012
Fire insurance @ 2 %	360	0.000	1,080	0.001
Depreciation @ 1.5 %	2,700	0.003	8,100	0.009
Power	18,000*	0.020	28,800†	0.032
	$48,060	$0.053	$118,980	$0.132

Difference in costs, $0.079.

	First Cost	Interest and Amortisation‡	Per Ton	First Cost	Interest and Amortization	Per Ton
Underground development and equipment......	$250,000	$30,000	$0.033	$400,000	$48,000	$0.053
Hoisting and miscellaneous equipment............	75,000	9,000	0.010	100,000	12,000	0.013
R.R. yards and sidings..........	60,000	7,200	0.008	60,000	7,200	0.008
	$385,000	$46,200	$0.051	$560,000	$67,200	$0.074

Difference in other costs, $0.023.

*Figured at 1c. per kw.-hr. †Figured at 1.6c. per kw.-hr. ‡Interest and amortization are figured at 12 per cent.

Mr. Kniffin said that with triple shifting of places the development work for each ton of coal mined would remain approximately unchanged. The working places would be kept open a shorter time and fewer breasts would be required for any given output. As for the difficulty of keeping development sufficiently ahead of mining he believed that with more intensive operation of the development forces it would be possible to bring about faster and cheaper work, as had been the case in metal-mining practice. He admitted that it would be difficult to change the long-established custom which gave the employees the natural recreation and rest time of the day to spend with their families. "The small margin of saving that three-shift operation presents might well be considered as an investment in the welfare of the workers."

William H. Grady, of Duncott, Pa., pointed out that today the working hours were less than eight at the face of the breast and that twenty or forty years ago it was much more than eight. As a result output is below what it should be. He believes that breasts could be worked continuously.

R. H. Stockett, of the Locust Mountain Colliery Co., declaring that it would be almost impossible to get labor to accept the three-shift plan, stated that miners usually were at home by 1 p.m., whereas a few years ago they arrived home so late that had there been movies in those days they would have been closed before the miners could attend them.

Eli T. Conner agreed that at present the triple shift was unthinkable, but when the market comes to demand a larger output than a single shift will provide, the engineers of the region will find a way to provide machinery to accomplish the desired result and will induce the men to work as many shifts as are necessary.

Douglas Bunting, general superintendent, Lehigh & Wilkes-Barre Coal Co., said that in that part of the article referring to underground forces it will be found, on totalling up the workers in the four operations cited, that there are 1,174 miners and laborers, 817 inside company men and 53 outside company men. If that is correct 46 per cent are miners and laborers, 33 per cent inside company men and 21 per cent outside men. That would go counter to the fact that in general the number of miners and laborers constitutes only 30 to 40 per cent of the men employed.

Mr. Bunting said that this discrepancy between his experience and Mr. Ashmead's figures may have arisen from Mr. Ashmead having failed to include floating gangs such as many anthracite operations carried. He felt that these should be included. Mr. Ashmead replied that his figures are based on the mine inspectors' reports.

William Griffith, of Scranton, remarked that the tonnage that would result from triple shifting could never be placed on the market. He had collected figures at one time for a financial journal. They showed that to hold its own anthracite must be sold at a price not more than $3 above the price of bituminous coal.

It may be said here that charts 1-B and 4-B in Mr. Ashmead's article, which appear on pages 163 and 166 of this volume, should be corrected so that the extreme left ordinate should be 10 in one case and 100 in the other. The figures have been shifted to the right one space in both cases, overlooking the fact that the true origin of co-ordinates is omitted from the illustration.

G. L. Stevenson then explained the "Engineers' License Act" of Pennsylvania which goes into effect June 1, 1922, and moved that the Institute of Mining and Metallurgical Engineers endorse the efforts which the Engineers' Society of Northeastern Pennsylvania is making to have the act declared unconstitutional.

Coal Mining Leads in Loss of Wages and Time from Accidents in Pennsylvania

WAGES lost in Pennsylvania in 1921 because of accidents amounted to $9,924,959, according to the Workmen's Compensation Bureau of the Department of Labor and Industry, which gives 2,061,733 days lost by workers because of disability. Of this total number of days lost 748,623 are attributed to the coal miners for disability while the amount of wages lost to these workers was $4,085,460, or nearly one-half the total loss.

Last year there were 41,339 accidents for which compensation was paid inside the mines of the state and 8,619 outside, in the anthracite and the bituminous fields. There were more amputations in metal work and mine cases than in all other industries combined, with 114 in coal-mine accidents and 105 among metal workers.

Dependent upon those injured in 1921 were 108,598 persons. The 1,924 fatal cases in the state resulted in compensation being provided to 2,164 dependents. The report of the bureau says relative to fatalities and accidents in the mines: "More fatalities were attributed to the coal-mining industry than any other, excluding metal workers. There were 904 fatal accidents reported in the mines. There were 15,829 cuts and lacerations in mine accidents, 21,754 crushes and bruises, 3,355 fractures, 5,447 sprains and lacerations, 114 amputations and 106 asphyxiations. Blood poisoning developed in 1,526 accident cases in the mines."

Locomotive Has Two Motors, One Using Battery Power And One Current from the Trolley Wire

Current from Each Source So Different That Only Separate Motors Will Give Utmost Efficiency—Only One Motor Under Power at a Time but All Four Wheels Always Act as Tractors

ALTHOUGH the requirements for the economical handling of an enormous mine tonnage have not been, and probably cannot be, met in any one type of locomotive, certain types have been developed which have materially reduced the variety of equipment necessary for this work. At many operations the storage-battery locomotive has been found adequate for all the classes of hauling work demanded. The improvements that have been made in battery construction and locomotive design have extended the scope of this type of locomotive, originally intended for gathering work only, to entry work and in many mines where the distance is not prohibitive, to main-line haulage also.

The work that a battery locomotive will perform may be estimated closely because it carries its own source of energy, and its capacity is predetermined. From a careful survey of the work to be done, a locomotive of the proper type and capacity may be selected and all chance of failure eliminated. The most successful battery locomotives in operation today were installed on this basis, and at least one of the leading battery-locomotive manufacturers will not install a locomotive unless his engineers know that the work for which it is recommended is such as it can perform.

The advantages derived from the use of battery locomotives have resulted in a demand for a machine that can be used for gathering from the rooms and can also do much entry or main-line haulage, with a range of speed suitable for each class of work.

WAYS OF MATING TROLLEY AND BATTERY

The ideal locomotive would be one that combined the characteristics of the battery locomotive with those of the trolley locomotive, with the least sacrifice of efficiency. Such a locomotive should have a storage battery of sufficient capacity, without "boosting," to do a reasonable amount of work in sections not equipped with trolley wire, combined with some means for conserving the battery energy when it is operating in sections that are so equipped.

The characteristics of this type of machine are those of a battery locomotive. From the trolley only a predetermined amount of current may be taken, which means that all heavy demands for current in excess of the predetermined value must come from the battery. The voltage at motor terminals is maintained by the battery irrespective of the trolley voltage, which may be low owing to the heavy demands made by other equipment. Instead of the power plant being compelled to supply 200 or 300 amperes to propel the locomotive, it is called upon to supply only the predetermined amount of current to assist the battery.

Thus a locomotive of this type may be termed a trolley-assisting locomotive. When in contact with the trolley wire the battery may or may not be taking current, depending on what the locomotive is doing. If the locomotive is standing, the predetermined quantity of current to be taken from the trolley goes into the battery; if it is running light, the current necessary to propel the locomotive goes to the motor and the rest to the battery; if the locomotive is operating under load, all current from the trolley goes to the motor and combines with the required additional battery current necessary to move the load.

When running light with trolley in contact, the speed of the locomotive is about 15 per cent higher than when running off the battery, because the voltage at motor terminals is battery *charging* voltage instead of battery *discharge* voltage.

LOW-VOLTAGE OPERATION OF TROLLEY MOTOR

Another partial solution is a trolley locomotive to which has been added a storage battery, and the manufacturers of this type of machine claim that it has the characteristics of either a battery locomotive or a trolley locomotive, depending on the source of current from which it is drawing. Though the operation of this machine is normal when used as a trolley locomotive, it is inefficient when used as a battery locomotive because the lower speed is obtained by operating trolley motors at low voltage. The result is that a large percentage of the energy of the battery is absorbed before any work is done by the locomotive. These machines usually have two-motor drive, the motors being separately connected to each axle, and maximum tractive effort with minimum consumption of energy cannot be obtained in this way.

The latest development in combination locomotives is the Ironton Duplex, in which separate motors are provided for battery and trolley voltage, each being entirely independent of the other, thus retaining the characteristics so desirable in each type. It is equipped with a battery of approximately the same capacity as a straight battery locomotive of the same weight and when operating from the battery the operation is through a motor designed for battery voltage. When operating from the trolley a separate motor designed for 250 volts is used. No provision is made for charging the battery from the trolley, as experience has shown that the standard battery equipment is sufficient for the daily requirements in any situation for which this type of locomotive is recommended. In operations where the work is evenly divided between the battery and the trolley features, it has been found that the Duplex will handle all the gathering work without the battery being recharged every day.

The motors are placed in opposite ends of the locomotive. Each motor is connected to both axles through worms and gears inclosed in dust- and oil-tight cases, and operating in oil.

The adjacent ends of the worm shafts are connected by means of a two-joint universal coupling. The ends of this floating propeller shaft are provided with steel pins on which are mounted steel balls driving against longitudinal recesses in the housings. This combination pro-

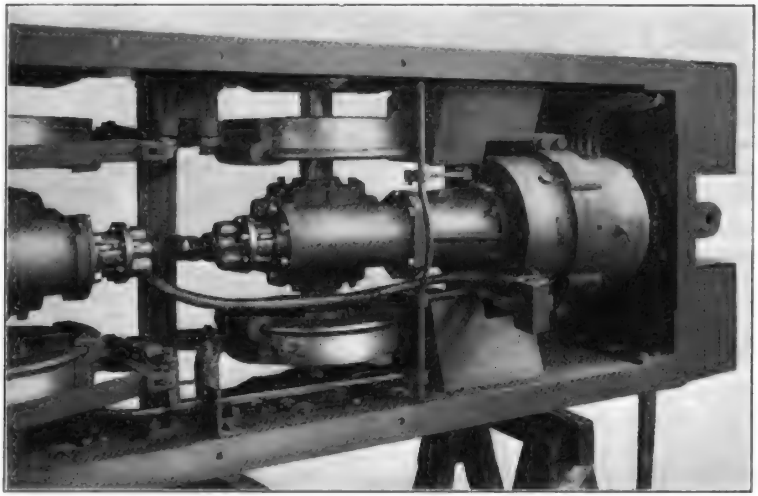


FIG. 1

Drive Unit

With distance piece between gear cases and motor. Note also the flexible oil duct leading to the gear case from outside the battery box. The sand boxes are protected with a cover on the inside of the frame and an opening is provided by which they may be filled from the outside of the locomotive.

vides a direct drive to all four wheels from either the battery or trolley motor and permits efficient transmission despite all the changes in angle resulting from the movement of the axles. Springs bear against the two ends of the propeller shaft and permit lengthwise movement.

To prevent misalignment, which would be highly detrimental to the proper operation of worm gearing, the gear cases are rigidly connected to the motor frames by cylindrical distance pieces which totally inclose the steel-jaw couplings between the worms and the motor shafts. The commutator ends of the motors are flexibly connected to the locomotive frame through universal joints which permit the motors to maintain proper alignment with respect to the axles and follow them freely, even over the rough track frequently found in mine rooms. The removal of cap screws at the motor end of the distance piece and the withdrawal of a pin in the motor support at the commutator end permit the motor and its half of the jaw coupling to be lifted out of the locomotive.

The gear cases are of cast steel and are provided with double-row combination radial and thrust ball bearings. They are supported from the axles. The motors are supported between the gear cases and the locomotive frame, thus distributing the weight of the complete assembly. Lubrication is supplied to the gear cases through flexible steel oil ducts leading to an oil box on the outside of the battery compartment.

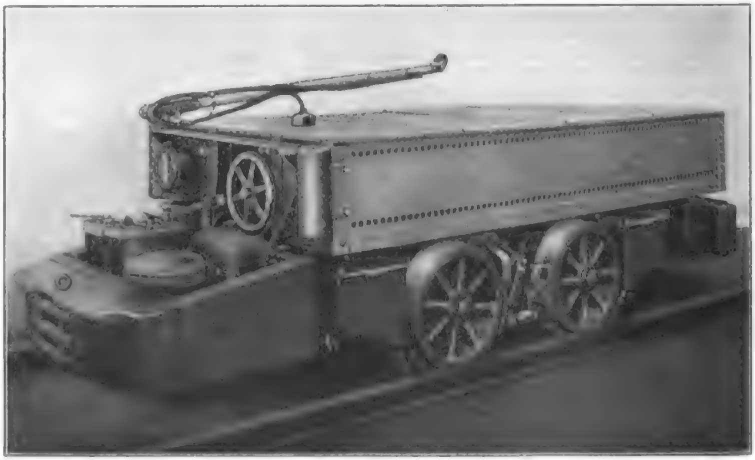
The thread of the worm and the teeth of the gear are shaped so as to afford a maximum of rolling contact and a minimum of sliding contact. This is quite different from the gearing made a few years ago wherein the contact was practically all sliding.

The worm is made of nickel steel, heat-treated and then ground all over. This process of grinding by special machinery corrects the distortions resulting from the heat treatment and insures that the teeth will

FIG. 2

Duplex Locomotive

Driven by separate motors for battery or trolley current. The battery is adequate for an all-day run and for more than a day if current is taken from the trolley. The trolley is not provided to help out the battery, which needs no help, but to provide greater power and speed on non-gathering service.



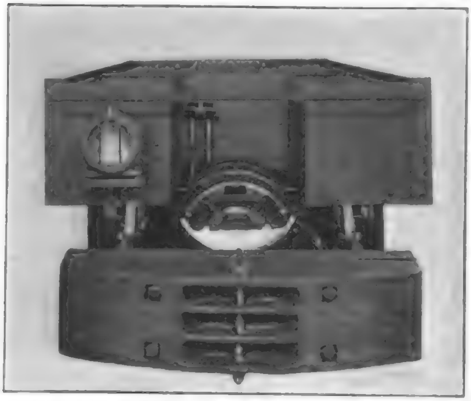


FIG. 3. FRONT VIEW OF LOCOMOTIVE
In this illustration the top is removed so as to show the accessibility of the motor and of the oil box at the end of the oil ducts by which the gear cases are supplied with lubricant.

be of the correct shape. The gear wheel is made of specially hard phosphor bronze, chilled to obtain maximum hardness and the desired physical properties as well as a low coefficient of friction. It is cast in the form of a ring, which is securely attached to a steel hub. This permits replacement to be made without disturbing the hub and insures proper alignment of the new part. The efficiency of this gearing should lie between 93 and 96 per cent.

The controller is of the double-drum type, the main or operating drums making connections for split-field control to both motors, while the second drum has two positions and connects one or the other motor to its proper source of energy. Safety locking features are provided to prevent accidental movement of the controller handle.

The general constructional details of this locomotive are the same as those followed in the other types built by this manufacturer. They include channel and plate-steel members, together with steel castings, heavily reinforced with angles and cross braces; cast-iron wheels with chilled treads or steel tires as desired; brakes of the equalizing type with quick-acting brake screw and hand wheel; heavy cast-steel bumpers mounted on solid oak cushions; wheels inside or outside of the frame, as may be desired.

This locomotive is made in a high and a low type. The approximate dimensions of the chassis of the high, or 10,000-lb., type are: Height, 42½ in.; length exclusive of bumpers, 12 ft. 6 in.; width including trolley sockets, 57½ in.; wheelbase, 36 in.; diameter of drivers, 22 in. The approximate dimensions of the chassis of the low, or 8,000 lb., type are: Height, 31 in.; length exclusive of bumpers, 12 ft. 10 in.; width, 64 in.

The advantages claimed for the worm drive, and they are amply substantiated by the experience of heavy auto-truck manufacturers, are: It permits the desired speed reduction to be made in one compact unit and the use of a medium-speed, high-efficiency motor; it requires a minimum number of parts and permits the complete inclosure of gears operating in a lubricant; it eliminates vibration and reduces armature trouble approximately 50 per cent; the worm is smooth-running and silent in operation and no adjustment of gears is necessary; stripping of teeth is impossible; the gear and the thread on the worm wear slowly and their efficiency is maintained throughout their entire life.

The number of parts that should be stocked is reduced to a minimum because axles, gears, worms and gear cases are interchangeable for either end of the locomotive. These parts also are interchangeable with the driving parts of the straight battery locomotive of the worm-gear type.

Bearing in mind that the combination locomotive is not intended to replace the trolley machine but rather to extend the usefulness of the battery locomotive without impairing its efficiency either altogether or in part, actual service requirements indicate that the motors should be designed for the voltage of the current upon which they operate. All wheels should be drivers in order to obtain maximum tractive effort. Speed under battery operation for gathering work should be approximately 3½ miles per hour at the rated drawbar pull, whereas for trolley operation it should be about 6 miles per hour in order to facilitite quick handling of loads to the main partings and the return of empties to the rooms.

The machine here described is designed to meet these conditions in the most direct and efficient manner. The flexibility obtained lends itself to all applications where a straight battery locomotive will not meet the requirements. In many operations it will do all the gathering and hauling. In the larger mines it will materially reduce the frequency with which partings must be moved, eliminate many trolley extensions and much rail bonding as well as avoid the necessity of using mixed equipment where conditions vary greatly from section to section. In those portions of the mine where favorable conditions prevail operation may be almost entirely from the battery while those where conditions are more severe may be successfully handled from the battery and trolley.

Flotation Plant Will Treat Slack, Sludge And Picking-Table Refuse

A NEW washery plant is being installed by the Western Fuel Corporation of Canada, Nanaimo, B. C., which is regarded as embodying principles as yet untried on the American continent. Provision is made for the incorporation of oil flotation cells such as have been found to be commercially practical as a result of experiments carried on during the last few months. Similar experiments have been undertaken by the Canadian Collieries (D), Ltd., and the Granby Consolidated Mining, Smelting & Power Co., these latter also being Vancouver Island companies.

John Hunt, general manager of the Western Fuel Corporation of Canada, has two objects in view in introducing oil flotation—to produce clean coal and to use material heretofore wasted. The washery plants on Vancouver Island have hitherto used Robinson cone washers, it being customary to treat the fine residue from the cone washers by passing it through jigs and over concentrating tables. No serious effort, however, has been made to concentrate the coal in the slack and sludge, which have gone to waste dumps or been deposited in the sea.

The coming summer should see the new plant in operation, as construction already has started and the machinery has been purchased. P. E. Peterson, well known as a pioneer in oil flotation, is the designer, and it is said that the plant is remarkable for its simplicity,

NO. 1 MINE, WESTERN FUEL CORPORATION OF CANADA, NANAIMO, B. C., AS SEEN FROM THE SEA

requiring at the most two men per shift to supervise its operation. It will be an addition to the present washery, in which jigs have been discarded and four Deister coal concentrating tables substituted.

Refuse from the picking tables of the present washery and outside refuse will be the materials treated. That from the dumps will be delivered by paddle conveyor to a trommel. The oversize will pass from the trommel down a launder to an 8-ft. Hardinge ball mill and the undersize will pass by gravity into a screw classifier, the oversize from which will be carried by gravity onto two Diester coal concentrating tables. These tables produce three products, viz.: coal, middlings and rock.

The undersize, or overflow from the screw classifier, will be carried by gravity to a battery of six Peterson flotation cells; the product from two of these cells will be clean coal and that from the other four middlings. The coal from the flotation cells will pass by gravity into a settling tank 30 ft. in diameter, from which the dewatered fine coal will pass to a paddle conveyor, by which it will be carried to railroad cars ready for market.

The middlings from the flotation cells will pass by gravity along a launder to a bucket elevator near the ball mill, into which the overflow water from the settling tank also is discharged. The bucket elevator discharges into a launder along which the material passes by gravity onto the trommel screen and will be subjected to the same series of treatments as have been described. The coal and middlings concentrates made on the Deister tables will be carried by gravity to a second screw classifier near the settling tank and the fine dewatered coal will be carried to the paddle conveyor, which will deliver it into the railroad cars. The refuse from the picking tables is carried in cars to a bin, from which it will go into a Blake crusher, which will discharge the roughly crushed material into the Hardinge ball mill.

AT THE CENTRAL DISTRICT STATION of the Bureau of Mines at Urbana, Ill., laboratory work on the distribution of sulphur forms at certain mines in the Illinois No. 6 bed has been completed. Sulphur forms have been determined in the raw coal, clean coal and refuse resulting from washing this coal on the S. S. & S. concentrating table at Dallas and on specific gravity fractions.

DR. A. R. POWELL, of the U. S. Bureau of Mines, is conducting an investigation to establish the form in which sulphur occurs in coke. A scientific study of this problem is necessary before further work on coke desulphurization can proceed.

Mr. Bock Considers Three-Shift System

Staunton ILL. Feb. 1the. 1922

Editor *Coal–Age.*
New York.

Dear Sir:

Right on the heel, after mailed my letter, I received Vol.21.No.4.*Coal–Age.* In judging from serval Article and letters,I would threw my writing in the wate basket

I kindly beg to pardon me if get somtime to harsh in words, I sadly regert to study the condition to serious, wich arouse a awakening feeling of veneration; we chasen around in a circle like a dog to catch his own tail insomuch a Men would wonder, wy is it impossible Men wont work on a three shift system in a Coal Mine? perhaps Mr. Dever C.Ashmead means to say in his Article page 162 Vol. 21 the Men are not acustumed to it ;last summer a company of these Town tried to double shift certainEntry s and found oppositon by the Men, now the close the Mine,it is costume .—WY?— The cause lies deeper,what is the use to pass any more words over, costume, predominats Coal Mining more than any other Industry, we hear Men profess, protest, give great words what should be done, and than do as just others done before,the are nothing but dead images and ben only propeled by the force of Costume;we are costumed to so many things that we be come a slave to costume.—

With the progress of life costumes either degenerate ore wear out according to the evolution,and become bad and a nussiance to the wellfare of humantty;history tells uss where the forces of bad and degraded Costumes createt endless hardship on the human race.Now since Costume be the prinziple factor to govern mind and body of Mankind,let us obtain good costumes;good Costumes can only be perfectet if begun in young years,wich is education wich is in turn the earlys Costum of Civilization.BadCostumesin the Russian Government degraded in a political Oligarchyand a very smal one at that.the same is true especialy in our Mining Industry we have a Industrial Oligarchy ,and on of the worst kind at thatbut what is the use to waste any more timeon that

"Woulstthou be free?–The chain that gall thy breast;
With on strong effort burst,and be at rest.—(Fr. Bacon) I am gentlemen, yours very truly

Henry Bock.

Light Ash, Heavy Coal and a Large Percentage of Fines Complicate Vancouver Island Jig and Table Washing*

Coal from Some Mines Is 85 Per Cent Fines—Some Fine Coal Is Cleaner Than the Larger—Coarse-Material Table Prepares Four to Five Tons Per Hour; Table for Finer Material Six to Seven Tons

BY M. W. GARMAN†
Cassidy, B. C.

COAL from some seams is so free from deleterious material that only dry screening is needed to produce a good fuel, but on Vancouver Island this is not so. In earlier days the chief product of a mine was lump coal, with perhaps egg or nut, all prepared by dry screening; the remainder was a waste product. But today the value of the small sizes is being recognized, so that what was once a waste product has been converted by washing into a salable fuel, to the advantage of both the producer and the consumer.

In the following notes on the washing of Vancouver Island coals only those from the seams of the Nanaimo field are under consideration. In this field all the seams except the Newcastle make a large quantity of fine coal, so that of the whole product 40 per cent to 85 per cent is screenings of less than 2-in. mesh. The coal of the Douglas seam is especially fragile, as much as 85 per cent of it being screenings of the size indicated.

PREPARATION BEGINS WITH MINING OF COAL

For several reasons the preparation of coal should begin in the mine. Where a coal is friable, like that of Vancouver Island, the underground management should use great care to see that all unnecessary breakage is eliminated. Powder should be used with due caution in the shooting of the coal, which also should be loaded and transported with all care. All impurities, such as rock, bone and dirt, should be extracted as far as possible, and where the purity of the coal at any working place is in doubt, a sample should, if practicable, be taken and analyzed. If it is found to be too high in ash, the place should be stopped, or if the roadway must be driven for haulage or ventilation, or for any other reason, the material should be gobbed—that is, left in the mine—and not sent out with the other coal. Unfortunately many regard a washery as a place where 100-per cent extraction can be made from any class of material. In reality the higher the ash content in the coal, the lower the possible recovery, the washery being only a part of the preparation plant necessary to produce a marketable product.

In the Nanaimo field three kinds of washers are used, namely, jigs of various types, as the Luhrig, New Century and Stewart; cone washers, as the Jeffrey-Robinson, which is a combination of a hydraulic classifier and a centrifugal machine; and tables, as the Massco and Deister-Overstrom types.

Before taking up the system of washing in use at the mine where I am employed, a few general remarks as to the nature of the coal and its impurities are desirable. The coal itself may be roughly divided into three classes with respect to its hardness: (1) A hard, dull gray coal; (2) a medium hard, lustrous coal, and (3) a dark, dull, soft variety. It must be understood that these divisions are not hard and fast differentiations, for intermediate varieties connect them.

Both the specific gravity and ash content have a wide range. The former runs from 1.24 to 1.60, and the latter from 4 per cent to 26 per cent, but there is no apparent relation between the ash content and the specific gravity. The wide range of the latter shows that some coal will be lost in washing, because there is not enough difference between the specific gravity of the coal and the rock and because flat, flaky pieces of the latter have a tendency to go over with the coal. The refuse coming from the mine with the coal is chiefly rock, bone coal, shale and clay, of varying specific gravities and ash contents. Table I shows some of the variable qualities of the coal and refuse, but it by no means exhausts them all. The arrangement in each case is according to increasing ash content.

TABLE I. RELATION BETWEEN DENSITY AND ASH CONTENT

	Coal		Refuse	
	Specific Gravity	Ash Percentage	Specific Gravity	Percentage
No. 1	1.30	3.86	1.76	42.22
No. 2	1.25	3.90	1.57	44.37
No. 3	1.32	7.12	1.91	57.13
No. 4	1.28	7.50	1.75	62.25
No. 5	1.24	7.63	2.00	68.50
No. 6	1.60	8.22	1.77	75.34
No. 7	1.30	9.00	2.25	84.55
No. 8	1.31	15.57	2.60	88.38
No. 9	1.38	17.55	....	....
No. 10	1.43	26.25	....	....

The process of washing at Cassidy is as follows: Mechanical feeders take from the coal bin the raw feed, consisting of minus 2-in. screenings from the lump coal screen, and deliver it to two Stewart jigs each of a capacity of forty tons per hour. These jigs are of the double-compartment type. In the first compartment the heavy rock and heavy bone are removed, and in the second the lighter bone and any rock which may have passed over from the first compartment. Some screen analyses are to be found in Table II.

TABLE II. SCREEN ANALYSES OF RAW FEED TO JIGS

Size	Percentage
+ 2-in. mesh	0.0
+ 1-in. mesh	14.3
+ $\frac{9}{16}$-in. mesh	22.6
+ $\frac{1}{4}$-in. mesh	4.4
+ $\frac{1}{8}$-in. mesh	15.9
+ 20-mesh	19.9
+ 40-mesh	9.7
+ 60-mesh	4.6
— 60-mesh	8.6
	100.0

Size	Ash Percentage
Nut + 1-in. mesh	10.9 to 18.05
Pea + $\frac{3}{16}$-in. mesh	28.6 to 17.30
Slack — $\frac{3}{16}$-in. mesh	60.5 to 26.67

These analyses give a clear idea of the large percentage of fines in the raw feed, and they show clearly that great care ought to be exercised in mining, in order that these fines may be reduced to a minimum; as it is, much good fine coal is lost in washing.

Whether sizing should precede or follow washing will depend on the particular plant and mine concerned, though in general I believe that where the coal is of a soft, friable nature, sizing after washing is best, as it means a cheaper initial outlay, and the breakage is reduced by sizing the coal but once.

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*Article entitled "Coal Washing in Vancouver Island," to be presented at the annual general meeting of the British Columbia Division of the Canadian Institute of Mining & Metallurgy, February, 1922.

†Assayer, Granby Consolidated Mining, Smelting & Power Co.

The jig bed at Cassidy is carried deep enough to prevent too great a loss of fines—12 to 14 in. in the first compartment and 10 to 12 in. in the second. The material that goes into the hutch is chiefly fine rock and clay of a minus 3/16-in. mesh. If for any reason the bed becomes thin, as sometimes happens, some fine coal of this size is lost. In the jigs coal passes over with the impurities, as the specific gravity of these is not far removed from that of the coal; also because the impurities are in large part of a flat, thin, flaky character, the buoyant effect of the water being greater on this material than on the mass of the particles. Consequently the ashy material is not well separated, many of the flat particles being washed over with the coal. Another source of trouble is that the carbonaceous clay, which is associated with the coal, forms a slimy, pasty mass with the jig water, and is difficult to eliminate. The coal becomes coated with a film of this mud, which gives it a bad appearance when dry and tends to increase its ash content. Spraying this coal has a beneficial effect.

From the jigs the coal goes to a revolving screen, where the washed nut and pea are separated from the slack. The pea goes into the washed-coal bin with the washed slack, the nut being taken to the washed-nut bin or loaded directly into railroad cars.

The washed slack from the jigs, after being screened out from the nut and pea, is run into the sludge tank, whence it is passed by an elevator and conveyor to mechanical feeders which feed it to the tables. A screen analysis of the table feed is as indicated in Table III.

TABLE III. SCREEN ANALYSIS OF TABLE FEED

	Percentage		Percentage
+ 3/16-in. mesh	0.0	+ 40-mesh	15.9
+ 1/8-in. mesh	2.6	+ 60-mesh	6.7
+ 1/16-in. mesh	34.2	— 60-mesh	10.6
+ 20-mesh	30.0		

The tables used are of the Deister-Overstrom type, each handling from four to six tons per hour, with a recovery of from 88 to 93 per cent. A screen analysis of the washed slack and of the refuse from the tables is shown in Table IV.

TABLE IV. SCREEN ANALYSIS OF TABLE DISCHARGE

	Washed Slack Percentage	Refuse Percentage		Washed-Slack Percentage	Refuse Percentage
+ 3/16-in. mesh	0.0	0.0	+ 40-mesh	14.6	20.4
+ 1/8-in. mesh	5.2	...	+ 60-mesh	3.7	13.0
+ 1/16-in. mesh	27.6	23.4	— 60-mesh	2.9	14.2
+ 20-mesh	46.0	29.0			

Fine coal passing through 3/16-in. openings and smaller is most satisfactorily washed on tables; but in this field a preliminary washing in jigs is advantageous, especially where carbonaceous shale and clay occur in quantities, for quite a percentage of it is eliminated through the hutch, and by carrying a good jig bed, little fine coal of good quality is lost. No hard and fast rules can be made regarding table washing of coal, especially coal in this field. Various adjustments will be necessary before a combination is found that will give the desired results. These adjustments are chiefly for the following: (1) Speed, or number of strokes per minute; (2) length of stroke; (3) horizontal inclination or elevation of the table; (4) its transverse inclination; (5) quantity of feed; (6) regularity of quality of feed; (7) amount of feed water, and (8) amount of dressing water. All these have their effect on the efficiency with which the coal is washed.

The mechanical feeding mechanism in use at this washery has been worked out on the plant to suit the conditions. It gives a regular, steady feed. This is highly essential in table washing, if a good separation is to be obtained. The impurities to be eliminated are about the same as in the jigs, viz., rock, bone, clay and shale; and here again, owing to the fact that both the coal and the impurities have a wide, and to some extent overlapping, range in specific gravity, trouble is often incurred by coal going over with the refuse. Especially is this true if the tables are crowded or overloaded and if the feed contains an excessive quantity of fines, more particularly if the fines contain quantities of carbonaceous shale and clay. I have found that with this class of coal from four to five tons per hour is the greatest feed that is, in general, consistent with good washing.

The usual indication of good washing is clean washed coal and a high-ash rock. This, however, does not quite hold true here, for it has been found that a high-ash rock usually gives a high-ash washed coal, the reason being that some of the lighter refuse, such as shale and light bone, has floated over the riffling with the coal, while only the heavy—that is, high-ash—bone and rock go out with the refuse discharge. Test samples must be taken at frequent intervals and daily assays for ash must be made, in order to determine the loss of coal and to work as economically as possible.

From the tables the washed coal goes to a dewatering conveyor and thence to the washed-coal elevator and into the washed-coal bin. The fines from the upper and lower decks of this dewatering conveyor (which serves as a conveyor of raw feed to the tables and also as a conveyor of washed coal away from them) are passed to two other tables, where they are washed. The fines from the top deck are unwashed coal, while those from the bottom deck are fines that have been washed over with the coarser slack. Screen analyses of the feed, washed coal and refuse from these tables are given in Table V.

TABLE V. SCREEN ANALYSES OF FINE COAL, UNWASHED AND WASHED, AND OF THE REFUSE

	Feed Percentage	Washed Coal Percentage	Refuse Percentage
+ 1/16-in. mesh	0.0	0.0	0.0
+ 20-mesh	23.5	26.4	20.7
+ 40-mesh	35.7	40.1	19.0
+ 60-mesh	23.6	20.0	19.0
— 60-mesh	17.2	13.5	41.3

These tables can each handle from six to seven tons per hour, the feed averaging 21 per cent ash, the washed coal 14 per cent and the refuse 45 per cent, a reduction of 33 per cent of the original ash content. The greater capacity of these tables, as compared with the others, is attributable to a better classified feed. A recent test gave the results shown in Table VI, and, as will be seen, the recovery was 94.6 per cent.

TABLE VI. PRODUCT OF TABLES TREATING COAL ONE-SIXTEENTH-INCH MESH AND UNDER

Washed slack	13.44	tons per hour
Refuse	0.76	tons per hour
	14.20	tons per hour

The washed coal from these tables is conducted over a dewatering screen and thence to the washed-coal elevator. The wash water for the jigs is used over and over again, but the water for the tables comes from a Dorr thickener, which clarifies the overflow wash water from the jigs, sludge tank and elevating conveyor.

The water flowing into the thickener usually carries 6 per cent of solids with an average ash content of 35 per cent; the clarified water leaves the thickener with 0.15 per cent solids, a clarification of 99.9 per cent.

A screen analysis of the thickener discharge is as in Table VII.

TABLE VII. SCREEN ANALYSIS, THICKENER DISCHARGE

Size	Percentage	Ash Percentage	Size	Percentage	Ash Percentage
+ 20-mesh	0.0	*	+ 100-mesh	5.00	18.75
+ 40-mesh	0.25	*	+ 200-mesh	35.00	25.60
+ 60-mesh	3.00	14.22	— 200-mesh	49.75	36.20
+ 80-mesh	7.00	16.97			

* Combined with + 60-mesh.

This gives an average ash of 29.4 per cent. The dilution of the discharge is 44.3 per cent solids, which amounts to about 100 tons per 24 hours. The inflow water is passed into an experimental oil-flotation cell. Regarding coal flotation the experimental results thus far are satisfactory, but some further work is necessary in order to complete details for good economic working results.

Details of float-and-sink tests (Tables VIII and IX) are given so that the results of washing may be seen at a glance. From them, also, the difficulties of washing Vancouver Island coal will be appreciated. In Table VIII the raw feed to the jigs is in all cases minus 2-in. mesh material, and the solutions in the several tests have the specific gravity indicated.

TABLE VIII. FLOAT-AND-SINK AND ANALYSES OF RAW FEED TO JIGS

Specific Gravity of Solution	Float and Sink	Percentage	Ash Percentage
1.3	Float	38.5	7.21
	Sink	61.5	29.38
1.4	Float	71.5	10.67
	Sink	28.5	42.69
1.5	Float	77.5	12.58
	Sink	22.5	49.21
1.6	Float	87.5	15.61
	Sink	12.5	56.50
1.7	Float	88.0	18.10
	Sink	12.0	66.08

The average ash of the sample used for this test was 20.66 per cent.

TABLE IX. TEST ON RAW FEED, WASHED COAL AND REFUSE

Raw feed to jigs			
Sample 22.80% Ash	Float	56.0%	Ash 9.38%
	Sink	44.0%	Ash 43.43%
Washed coal from jigs			
Sample 14.30% Ash	Float	77.67%	Ash 10.16%
	Sink	22.33%	Ash 26.68%
Refuse from jigs			
Sample 67.05% Ash	Float	2.5%	Ash 16.00%
	Sink	97.5%	Ash 68.16%

Float and sink tests on table products

	Float	Ash	Sink	Ash
Feed to tables	59.00%	10.00%	41.00%	40.00%
Washed slack	71.00%	9.50%	29.00%	31.32%
Rock	4.00%	14.65%	96.00%	46.60%

Float and sink tests on tables washing fines from dewatering conveyor

Feed to tables	Float	69.0%	Ash 12.50%
	Sink	31.0%	Ash 41.49%
Washed slack	Float	70.0%	Ash 11.10%
	Sink	30.0%	Ash 35.20%
Refuse	Float	1.5%	Ash 20.67%
	Sink	98.5%	Ash 53.73%

I hope by these notes to convey some idea of the complexity of Vancouver Island coal and the difficulties encountered in preparing it for the consumer's use. It may not be out of place to call attention here to the lack of knowledge on the part of consumers of coal, especially the domestic consumer, regarding the value of the smaller sizes, as now prepared by the island washeries, as compared with lump coal, which is now in chief demand for domestic use. Lump coal commands the highest price, but after buying it the consumer immediately breaks it into smaller sizes, often making considerable slack or fine coal. Washed No. 1 and No. 2 nut and pea coal are eminently suited for domestic consumption, being quite equal in calorific value to lump, with the added advantage of being much cheaper.

A **New Investigation**, to determine the composition of the gas arising from a fuel bed, is under way at the Pittsburgh Experiment Station of the U. S. Bureau of Mines.

Concrete Switch Boxes Cheaper and More Efficient Than Brick-and-Mortar Boxes

By Alphonse F. Brosky
Pittsburgh, Pa.

The first paragraph under Item 53 of the Pennsylvania Bituminous Coal Mine Compensation Rating Schedule, entitled "Contact Hazards," contains the following provisions: "All electrical material shall be of an approved make, and be firmly placed in secure and workmanlike manner. All switches (except trolley-wire switches) shall be of an enclosed type and operated by an insulated handle." The subject of the paragraph, "Contact Hazards," indicates the aim of this ruling. It is urged that precautions be taken to protect men when in the act of throwing a switch, and this protection is obtained most readily by the use of switch boxes.

Boxes placed in the rib should be provided for the housing of feed-line switches. These usually are of brick and mortar and built in place. A box of this character, however, has its drawbacks. To show this an every-day example may be taken. The face of a butt entry has advanced far enough for permanent wiring, and the electrician is given the necessary instructions. He looks over the situation and decides upon the best location for the switch, indicating its position with chalk. Someone is set to work digging a hole in the rib to receive the switch box. Only a small amount of material is needed

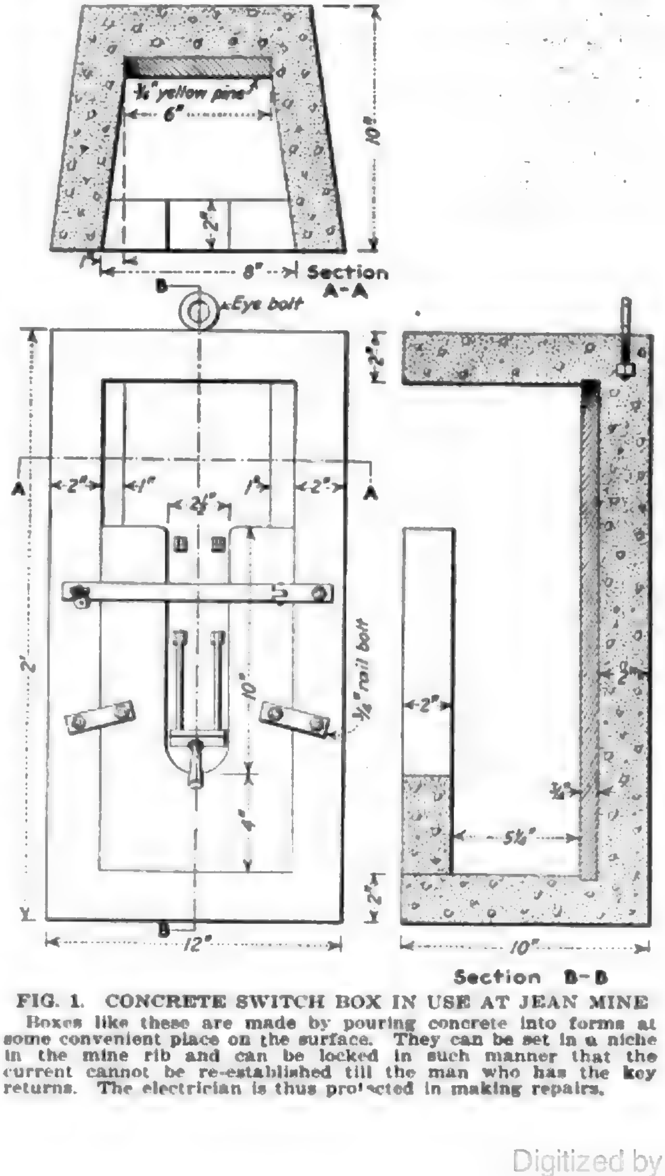


FIG. 1. CONCRETE SWITCH BOX IN USE AT JEAN MINE

Boxes like these are made by pouring concrete into forms at some convenient place on the surface. They can be set in a niche in the mine rib and can be locked in such manner that the current cannot be re-established till the man who has the key returns. The electrician is thus protected in making repairs.

for the job, but much time is lost in bringing it in. Any excess of material usually is scattered and wasted. This loss may amount to only a few cents, but it is tangible, nevertheless. A mason then proceeds to build up the switch box, usually taking from two to three hours to complete the job.

Even after this box is finished it is not as serviceable as one of concrete. In most instances it has no door, and in any case is not water resisting. Furthermore the switch grip may become charged because of the dampness. Locking arrangements are seldom provided and are difficult to embody in this type of construction. When a section is abandoned and no further use can be made of the switch or the box, the concrete box may be salvaged, but the one built in place is a total loss.

At the Jean mine of the Bertha Coal Co., at Dinsmore, Pa., concrete switch boxes are used. Constructed and installed at small cost, they are nevertheless more desirable and efficient than if constructed of brick. The forms utilized in pouring may be constructed of ¾-in. yellow pine or similar material and used over and over again. These forms are collapsible, the various members being so hinged and hasped together that they may be loosened and drawn away from the finished casting. The chief dimensions of the concrete box are given in Fig. 1, and the method employed in fastening the several parts of the outer and inner forms as well as that for the door is shown in Fig. 2. The information conveyed by the drawing and photograph is sufficient to enable any competent carpenter to build the necessary forms.

The concrete used in casting these boxes consists of one part cement and one part sand. A 25-lb. powder can filled with cement and another with sand, with enough water to give the proper consistency, have been found to furnish a sufficient quantity to make one box, with nothing left over. Porcelain insulators are provided in the side walls for carrying the wires to the switch terminals. Insulators so damaged as to render them useless for wire suspension may be utilized for this purpose. The intact portion is chipped straight and to a length of about 2 in., this being the thickness of the walls of the box. These insulators are held in place during the pouring by the insertion of small rods through the box form, from which the insulators are suspended. Four insulators, two in each side wall, are provided, although only two wires enter the box. The four openings provide exits for the wires, one or two on either side.

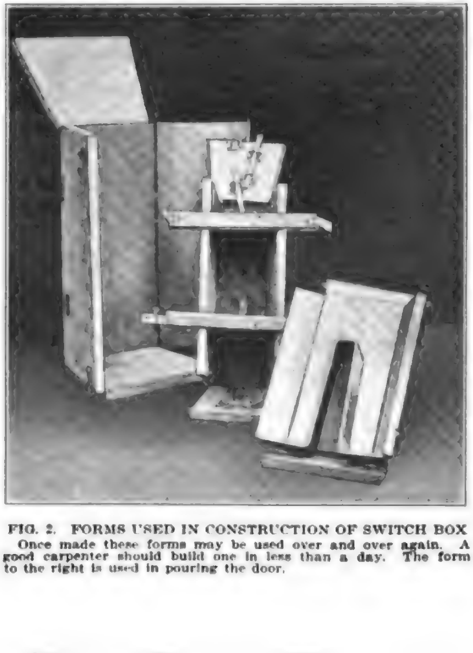


FIG. 2. FORMS USED IN CONSTRUCTION OF SWITCH BOX

Once made these forms may be used over and over again. A good carpenter should build one in less than a day. The form to the right is used in pouring the door.

For fastening the cross bands which secure the door and lock the switch ½ x 3-in. bolts are used. These are set in place by hand after the concrete has been poured. The door containing the V-shaped opening is reinforced with wire or any other suitable material. The side walls of the cope or center box form are not hinged to the bottom board. These pieces are securely fastened to the form blocks or partitions below the arms, these blocks in turn being fastened to the bottom or floor board by means of hinges.

The ends come away entirely and are held to the side walls by means of hasps. The bottom or floor board is well shellacked before assembling the form, and projects slightly beyond the end boards. After the concrete has set, the screws are removed from the hinges connecting the floor board with the two partitions, the hasps are unfastened and the endpieces withdrawn. Finally the side wall and partition unit is lifted, leaving the floor board of the cope embedded in the concrete. It then acts as a panel or baseboard upon which the switch is mounted.

The hinged walls of the drag, shown on the left in the illustration, fall away from the concrete casting, as do also those of the door form shown on the right. The metal U-form is made of steel strap salvaged from a discarded mine car.

The time required to complete one box, including the mixing and pouring of the concrete, and the setting of bolts, insulators and reinforcing material, is forty minutes. This work may be done at odd times in one of the shops, and a number of the boxes kept in the supply room, so that they may be installed at short notice. The cost is approximately $1.50. This includes labor and material, with the box complete except for the switch itself.

These boxes will not only be used in room entries for feed-line switches but also on the main haulage roads for trolley cut-outs. Open trolley-wire switches are a source of danger because in throwing one of them the operative must stand directly over a rail, his hand meanwhile coming within a few inches of the wire. This risk may be obviated by wedging a box of the kind just described into a niche in the rib and connecting it with the trolley wire by means of lead lines. Lights on the inbye side will show whether the switch is on or off.

If an electrician cuts out a section of the mine in which repairs are to be made and the switch is of the open trolley-wire type or even an enclosed type with no locking provisions, his only protection is to hang up a danger sign. The use of the concrete box just described eliminates this hazard, as the switch may be effectively locked out, the electrician carrying the key in his own pocket.

COAL AGE INDEX

The indexes to Coal Age are furnished free to all who ask for them. The index for the last half of 1921 is now ready for distribution. A copy can be had by addressing a postcard to the subscription department of Coal Age.

Book Reviews

A Life of George Westinghouse

DESIRING that the notables of the mechanical engineering profession in America be duly celebrated, the American Society of Mechanical Engineers has commenced the publication of a series of monographs on the leading members of the society. The first of these, the "Autobiography of John Fritz," was published in 1912. The "Life of George Westinghouse," by Henry G. Prout, is the second of these publications, which is published by Scribners, and excellently has Colonel Prout performed his task.

As a rule the lives of great inventors do not fail of adequate chronicling, but it is possible hereafter that there will be men of wonderful achievement who will be in danger of doing their life-work, revolutionizing industry and being left without adequate recognition, for so intricate are modern inventions that only experts are now able properly to evaluate them. Discoveries and inventions which founded new industries and manifestly modified our manner of living will always find chroniclers, but men who take up the study and development of older industries and give them a new importance and value are regarded as merely developers and get little credit for a vision and an inventiveness in no way less marvelous than that displayed by those who first gave birth to the industry.

In regard to Mr. Westinghouse, he was in many matters so greatly a collaborator that his own contribution was often overlooked, and he is apt to be regarded as merely the manager of the activities of the remarkable group that his genius gathered around him.

In the early days, when lack of funds denied him opportunity to assemble around him leaders in all lines of research, George Westinghouse stood out as an inventor more clearly than in middle and later life. "Westinghouse" then got too often to mean the association of brilliant minds that his genius assembled and led, rather than Westinghouse himself. Those earlier years saw the development of the air brake, with which his name will ever be associated. But it is not with the design and construction of brakes that would bring a train weighing 300 tons in weight to rest from a speed of thirty miles an hour in the short space of 500 ft. that most readers will be most interested, though the work of disproving, with the aid of Captain (later Sir) Douglas Galton, the old Morin law that friction was independent of velocity has its bearing on all locomotive engineering, mine and other. The tests in Great Britain fully proved that the brakes should not be so strongly applied as to cause skidding and that on first application the pressure of the brake should be greatest, as the speed at that moment is highest and the friction resulting from the pressure of the brake is accordingly at a minimum.

In 1881 George Westinghouse took out a patent for automatically regulating either the engine or the dynamo in response to change in load, thus starting his work in the electrical field. Of that work Mr. Prout says:

> In the field of electricity he was not an inventor of fundamentals. He invented many useful details, but his great work was in stimulating, combining and directing the work of other men. When he entered the field he was already a world figure; a lodestone attracting from all directions. No other man combined the resourcefulness, the contact with scientists, the ardor for electrical development, the manufacturing plants, the organization of men in many groups, the vision, the optimism, the courage and the will to bring things to pass. Known the world over, he was the receptacle of the thoughts and ideas of scientists and inventors everywhere. He was the captain of them all, the man who received and co-ordinated and executed.

Westinghouse soon associated with him William Stanley and entered the electric-lighting field, buying up the company holding the patents of Sawyer and Man, which patents covered the carbonizing of paper and other fibrous materials in the form of an arch, soon, however, to be rendered of little avail by Edison's patents on a carbon filament in an exhausted container made wholly of glass, and not containing a stopper. In 1886 Westinghouse direct-current incandescent-lighting plants were installed in the Windsor Hotel, New York City, and the Monongahela Hotel, Pittsburgh, Pa. The first central-station Westinghouse equipment was installed at Trenton, N. J., the work being begun in May of that year. But Westinghouse's main accomplishments were to be in alternating-current development, in which he firmly believed and from which no discouragements could divert him.

Those who have become accustomed to large units for the generation of electricity will be interested to learn that only as far back as 1890 the largest generator ever built was of 250 hp. The armature shifted as much as an inch on the smooth cylindrical core. Despite the opposition to slotted armatures then prevailing, Westinghouse decided to adopt them to correct this failing, and they soon superseded all other types. Belt connections were soon succeeded by direct connection of engine and armature shaft.

The introduction of the transformer into America and its reconstruction as a practical electrical appliance from the form in which it was designed by a Frenchman, Lucian Gaulard, was another early achievement of Westinghouse. Stanley, still one of the Westinghouse engineers, built up the transformer core of E-shaped plates. Albert Schmid, another Westinghouse engineer, abandoned the use of paper as a means of avoiding eddy currents and found that the natural oxidation of iron plates was a sufficient insulation. Westinghouse himself invented the ventilated core to prevent overheating and the well-known oil-cooled transformer of the present time. This was in 1886, and in November of that year the Westinghouse Co. installed in Buffalo the first commercial plant employing the alternating-current system. The Stanley alternator and the Stillwell "booster," or "regulator," soon followed.

WOULD HAVE BARRED IT EVEN FROM SURFACE

Thus were the mechanical difficulties of operating with alternating current overcome. With equal determination Westinghouse met the cry that a form of current believed to be so potentially dangerous should not be harnessed for the public good.

It will be hardly permissible to discuss in detail Westinghouse's services in the development of the induction motor, for which patents were issued to Nikola Tesla on May 1, 1888. The labor of putting this new industrial implement on the market nearly swamped the Westinghouse Electric Co., five years later. In the same month and year that Tesla patented his motor, O. B. Shallenberger, chief electrician of Westinghouse's company, developed his alternating-current meter.

The rotary converter was another development of the Westinghouse associates. Originated by Siemens & Halske, it was given its present form by B. G. Lamme, of the Westinghouse organization. Other directions in which Westinghouse was active was in the making of gas engines and steam turbines, the single-flow turbine of Parsons becoming the single-double flow or impulse-reaction turbine of Westinghouse. Naturally the turbo-generator was an offshot of this machine.

To review the rest of the activities of Westinghouse would take no less a space than Mr. Prout has afforded it in his well-digested volume. It is needless to say they cover natural gas, fuel gas, the Westinghouse producer, the Nernst lamp, the Cooper-Hewitt lamp, the multiple-unit control, by which the several cars of an electric train can be controlled from the foremost car; improved car, air and electric couplings on trains, telephony, an air spring for automobiles, steel cars for railroads and signaling and interlocking switches. The appendix of patents at the end of Colonel Prout's book shows that Westinghouse took out a patent about every six weeks for forty-eight years.

The author of the book reviewed, Colonel Henry G. Prout, before joining the Union Switch & Signal Co., of which he later succeeded Mr. Westinghouse as president, had made a name for himself as one of the greatest editors in the technical publishing field. This experience and his business relationship with Mr. Westinghouse gave him an unusual fitness for this biographic work.

Problems of Operating Men

Edited by James T. Beard

Right and Wrong Ways of Laying Room Switches

Location of Frog by Spads on Entry, in Line with the Inby Rail in Room—Uniform Curve of Switch Track—Wrong Methods of Laying Switches Give Much Trouble in Operation

AS TRACK foreman for one of the largest coal companies in this field, I have been interested in the several references to the laying of mine-room switches, which have appeared at different times in *Coal Age*.

There are right and wrong ways of laying room switches. A wrong method is sure to give much trouble in the operation of the mine. Frequent delays will be caused by the derailment of cars passing in and out of a room where the switch is not properly laid.

All of this can be avoided if the trackman in charge has had the experience required for that class of work. Too many switches today are being laid by timbermen or other daymen who have little or no knowledge in regard to what is required in laying a good switch.

Important Points to Be Observed in Laying a Room Switch

Permit me, then, to offer a few suggestions and describe briefly some of the important points that must be observed if the work is to give satisfaction when finished. These points are few and simple and may be outlined as follows:

In order to make my meaning clear, I have prepared a sketch showing three forms of room switches most commonly found in mines. The first of these (a) shown on the left of the figure, illustrates a switch that has been properly laid at the mouth of a room turned off a main road.

The two figures (b) and (c), on the right of this one, each reveal common errors, in the location of the switch, that often cause trouble and annoyance to drivers, even when no actual derailment of the car takes place.

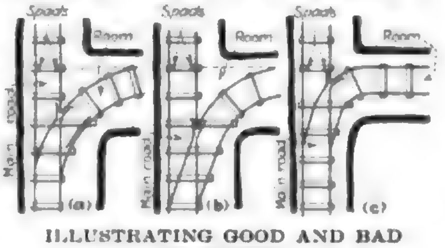
Spads Set on Entry in Line with Track in the Room

Describing these methods more in detail, let me say, it will be observed the spads have been set in the entry, in each case, in line with the inby rail in the room; or these spads may be set in line with the inby rib of the room, if desired.

Having located the spads, in the roof or timbers, on the main road, it is my practice to start the work by lining up the track and surfacing it so as to bring it to proper grade in the entry. If there are any bad rails these are replaced with good ones and this is all done before making any move to lay the switch.

Utilize Short Pieces of Rails

In laying a room switch there are always required some short pieces of rail. The next step, therefore, is to look up these short pieces, which are always to be found in a large mine, as the result of track rails being broken by wrecks or being otherwise made unfit for service on the main road. It never pays to cut a good rail if these short pieces can be found.



ILLUSTRATING GOOD AND BAD SWITCHES

The use of different track gages or having different widths of entry and the manner of turning rooms will, of course, give different dimensions for the length of lead rail and number of frog to be employed.

In our mine, with a 10-ft. entry, a 2½-ft. track gage and using a No. 2 frog, it is my custom to locate the point of frog about 9 ft. outby from the spads and use a 9-ft. lead rail. I am careful to lay the switch rails to a uniform curve, from the point of switch to the line of straight rail in the room.

A common error, in laying a mine switch, is to locate the point of frog at too great a distance from the spads, as shown at (b), in the figure. In that case, the tendency is to use a No. 2½ or No. 3 frog and the lead rail is run practically straight across the main road to the frog, before the curve leading into the room is started.

Again, as shown at (c), we often find a frog located at too short a distance from the spads and the lead rail lengthened. In both this case and the last one mentioned, the curve in the rooms is too short to give good service.

In any case, if the rails are not well lined up, the curve made uniform and the road well ballasted, derailment of cars is almost certain to follow.

G. W. Breeden, Track Foreman,
U. S. Coal & Coke Co.

Thorpe, W. Va.

Electric Cap Lamp for Miners

Safety lamp a handicap to the miner—Electric cap lamp safer—Enables the miner to produce more coal—Use of open lights dangerous.

PERMIT me to offer a few remarks commending the stand taken by Gaston F. Libiez in *Coal Age*, Nov. 24, p. 847, in reference to the passing of the miner's safety lamp as used by them at the working face.

For all general purposes I consider the safety lamp a handicap to the miner. I believe the constant use of the lamp tends to injure the eyesight and it is well known that it gives a poor light for the detection of bad roof, to which danger the miner is constantly subjected.

In my opinion, there should be a law, compelling all coal operators to equip their mines with electric cap lamps of a form approved by the Bureau of Mines, and restricting the use of the safety lamp to the examination of the mine for gas by firebosses.

As stated in the letter to which I have just referred, the Mine Inspectors' Institute of America recently passed a resolution recommending the disuse of the safety lamp, except for the purpose of testing for gas, and urging the use, by miners, of electric cap lamps instead. Coming from such a source, the recommendation is well worthy of the earnest consideration of every coal operator.

Greater Safety Assured by Use of Electric Cap Lamps

If our mines were equipped with electric cap lamps, the better light afforded would enable the miners to do more work and under safer conditions, provided their places were examined by competent firebosses, or safety inspectors, using safety lamps, say three or four times a day, during the working hours.

Under no conditions should miners be permitted to use open lights at the working faces. The mine may not be classed as a gaseous mine; but there is never any certainty as to when gas may appear in a mine that has never been known to produce gas before.

An incident that occurred in my own experience very forcibly impressed this fact on my mind when serving as mine foreman, at a mine where open lights were in use. No trouble had been experienced previously; but one day a miner's place struck a fault in the roof, which opened a gas feeder that was quickly ignited by the man's open light.

I was present in the place when this occurred and, by hard work, we were able to put out the feeder. As the place was making much gas, however, I at once ordered all lights in that vicinity extinguished and fenced the place off until the feeder should exhaust itself, which it did in a few days.

SUPERINTENDENT REFUSES APPEAL

My appeal to the superintendent to provide electric cap lamps for the miners was refused and I was given the choice of continuing to work the mine with open lights or give up my place, which I did a little later, as the men refused to work with safety lamps.

Had there been a law compelling this mine to be equipped with electric lamps, I would not have been under the necessity of resigning my position, by reason of my difference of opinion with the superintendent. It would be better if our mining laws controlled all mines, large and small. In many of the smaller operations the conditions are very bad and often quite unsafe.

In my opinion, there is no reason why a mine employing but two men should not come under the law as much as an operation employing ten or more men. Are not the lives of those two men as important as the lives of two other men working in a larger mine where they are safeguarded by the provisions of the law?

My observation of conditions in these small mines leads me to hope that the time will soon come when they will be compelled to comply with the requirements of the law, the same as larger operations. MINE FOREMAN.

———, Pa.

Use of Salt to Keep Mine in Damp Condition

Salt sprinkled by hand on timbers, floors and ribs proves satisfactory—Applied once a month—Cheaper than sprinkling with water — Generally more effective in allaying dust.

REFERRING to the interesting letter of a Chicago engineer inquiring with regard to the use of salt in mining practice, and the reply published in *Coal Age*, Jan. 26, p. 172, permit me to offer the following as the result of our own experience:

Some time since we were having more or less trouble with the dust question in our mines and at the suggestion of one of our mine foremen we used salt, in certain districts of the mines, to keep the dust damp. We have found this very satisfactory. It is an inexpensive method of obtaining the desired amount of dampness as compared with what would have been the cost to regularly sprinkle these districts.

We have five pairs of entries employing mule haulage, and being robbed back. These entries are some distance from any water supply and would require, when sprinkling at night, both mule and motor haulage to handle the sprinkling outfit. Owing to low timbers and heaving bottom, it was found that it was expensive business to get the sprinkling outfit to the face and, for this reason, we tried the salt with good results.

SALT SPRINKLED BY HAND

The salt is placed by hand, care being taken to get it over the tops and behind the legs of timbers, along the gob and on both ribs. One application will last thirty days. If we sprinkled with water the job would have to be done twice a week. In experimenting with salt, in advancing entires the salt maintained a dampness for over sixty days.

We think that the use of salt is of particular value in robbing work, as the dampness remains in the dust and gob after the pillars have been removed. Also you can put the salt where it will do the most good or where it is needed the worst; and this is hard to do under bad roof in robbing work, with a sprinkling outfit. We have used this for over two years now.

———, Tenn. MINING ENGINEER.

Solid Shooting vs. Machine Mining

Relative merits of solid shooting and machine mining—Solid shooting requires more skill than that of the average miner—Advocated chiefly to lower cost of production.

AFTER reading the excellent letter of William Crooks, *Coal Age*, Nov. 17, p. 806, I must confess being at a loss to know whether I would favor shooting coal off the solid or mining it by machines which has always been my preference.

Since reading the arguments advanced by that writer, I have given the matter much thought, but am still a strong advocate against the practice of solid shooting. Referring to the numerous accidents in Alabama mines, Mr. Crooks states that these have all occurred in machine mines. His inference that machine mining is responsible for those accidents is, however, in my opinion, wholly wrong.

SOLID SHOOTING NOT THE CAUSE OF EXPLOSIONS IN ALABAMA

Allowing that these accidents all occurred in machine mines, is it not more than likely that they were due to the fact that the mines were more developed and putting out a larger tonnage, which would increase their liability to accident, as compared with smaller operations shooting the coal off the solid and having a lesser output.

There is a trick in solid shooting if the work is to be performed safely. In my opinion, few miners are experts at the business, or can boast of their proficiency in getting good results when following this practice, which unfortunately has many advocates among the higher mining officials.

It has been my experience that to shoot coal off the solid consumes more powder, per ton of coal mined, and causes more roof to fall than where the coal is properly undercut or sheared. The reason is that the powder must do more work to break down the coal and, on that account, exerts a much greater force against the roof, which is weakened and falls readily.

When Mr. Crooks referred to the "differential" existing between solid shooting and machine mining, he uncovered a sore spot. The differential in these two practices of mining coal is the real reason why a large number of miners prefer solid shooting to having their coal cut by machines.

Indeed, I have wondered how it was possible to keep mining machines in the Illinois northern field, with the present existing differential. Reflecting on these conditions, it has occurred to me that my friend in Alabama may not be wholly disinterested when he expresses a preference for shooting coal off the solid.

MACHINE DIFFERENTIAL IN ILLINOIS

In Illinois, the pick-mining rate is $1.37 per ton and the miner is paid, for 2 ft. of brushing, at $7.50 a day. On the other hand, in machine mining, the miner receives from 91½ to 93c., per ton of coal, and there is no brushing.

The coal varies from 36 to 42 in. high and often contains blackjack or bands of sulphur that the machine must cut. At the best, a crew of three men will cut an average of four places per shift, allowing for an occasional breakdown of the machine and other delays.

Each place cut is 42 ft. long and, allowing 27 cu.ft. per ton of coal, a 4½-ft. cut, in four places, would yield about 90 tons. The machine runners rate being $8.04 per shift, makes the cost for cutting the coal $(3 \times 8.04) \div 90 =$ say 27c. per ton, to which must be added the cost for maintenance and repairs.

MACHINES DISCARDED FOR SOLID SHOOTING

Lately I was promised the charge of a machine mine and the superintendent informed me that he was going to discard the machines he had and use solid shooting. He stated that the miners were pulverizing their coal with heavy shots. It was difficult for me to understand this, as competent shotfirers were employed in that mine to shoot the coal at night.

My conclusion is that where a company is able to install machines, the mine is better managed and the work performed in a more business-like manner all around. The ventilation is more efficient; a minimum amount of explosive is used and the danger of solid shooting eliminated.

It is my belief that the near future will see less raw coal used in industrial operations and the production of lump coal will be less important. Present methods of mining coal will give way to modern machinery for extracting the coal in quantity and eliminate the use of powder for blasting it from the bed.

Peru, Ill. GASTON F. LIBIEZ.

Imagined Difficulties of Miners

Pension fund for disabled miners—Age limit set by few companies—A miner's best and most reliable capital is his code of honor.

I HAVE read with deep interest the two letters of Western men, one signed "Western Miner" and the other "Western Inquirer," appearing in *Coal Age*, Dec. 29, p. 1055.

The plaint of the last writer is pitiful indeed, but it seems to me that he does not realize present conditions in the world today. He fails to understand that he is surrounded on every hand by men of little knowledge and I would say, also, having a low grade of morals.

The letter of the first writer reminds me of an idea I suggested some time ago, in regard to maintaining a fund for disabled and aged miners, as a means of protecting honest workers from the unjust trespassing on their rights by those of their fellows who are less conscientious.

MINERS' PENSION SYSTEM, C. F. & I. CO.

This writer has mentioned the pension system adopted by the Colorado Fuel & Iron Co., which he discussed at considerable length. It is not my desire to in any way criticise that system or to reflect on the sincerity of the company who planned it.

My experience of ten years, in that country, leads me to say that the writer has only spoken the truth in what he has said regarding the working of the system. For myself, I fail to see how the honest worker is protected against the less conscientious fellows about him.

Let me ask, How are the higher officials of the company to understand the actual conditions in the mine, unless they make frequent visits to the mine, going into the workings and coming into personal contact with the men in their employ?

It is true, that there is a grievance committee that is supposed to report all matters and conditions as they exist in the mine; but it cannot be said that such a committee is an impartial court of inquiry, and the fellow who is not in favor with them suffers by reason.

PAST EXPERIENCES OF A MINER

Looking back on my own experience in life, I cannot but sympathize with the second writer who seems to think that his knowledge and habits of life should insure him better recognition than he has yet received.

To make a long story short, some years ago I gave way to dissipation and sank into the gutter; but an endowment left me by my parents, in childhood, prevailed and saved me from destruction. Let me say, for the encouragement of our friend, the miner's best and most reliable capital is his code of honor.

At the payroll window, a few days ago, the fellow ahead of me drew $137 and, though he has no family or other dependents, spent it all with gamblers and bootleggers so that two days later he had to ask me for carfare to get him home. It is this class of workers that is doing the coal industry a vast harm. Let us try to clean house by eliminating such. HENRY BOCK.

Staunton, Ill.

Inquiries Of General Interest

Mining Coal in Vicinity of Gas Wells

Gas and Oil Wells in Mining Districts a Menace to Safety—Ways and Means of Eliminating the Danger—Legislation Needed for Protection of the Coal Industry—The Evil on the Increase

RECENTLY much anxiety has been expressed regarding the danger that is imminent from the mining of coal in the vicinity of gas and oil wells. Owing to the large increase in the number of these wells being sunk in mining districts, the question of adequate protection for the mines is one of growing importance.

For that reason, I desire to ask for an open discussion of the subject, by readers of *Coal Age*. It is probable that many of our readers have experienced the difficulties of mining in the vicinity of these wells and can offer good suggestions as to how the danger due to their presence can be best overcome.

It may be remarked, in passing, that the danger from this source is not limited to the life of the wells, but exists long after the wells have been abandoned. Moreover what makes the situation worse is the fact that seldom any records of abandoned wells are available, and their presence is only revealed when they are encountered in the driving of rooms and entries, in the development of the mine.

It would be of special interest to hear from those who, before mining, may have sealed off gas wells, from the surface to a point below the coal-bearing strata. Let us hope for a good discussion. FRANK KAIN, JR.

Barton, Ohio.

We are glad to have attention again drawn to this question of mining coal in the vicinity of gas and oil wells, which at one time was a sorely vexed problem in certain districts of Pennsylvania where many such wells were sunk and later proved a serious menace to the mining of the coal in those localities.

Some eight or ten years ago, the matter was strongly agitated and discussed in *Coal Age*. The question, at that time, was brought before state legislators and suitable enactments sought to safeguard the coal industry.

There is no doubt that an old abandoned oil or gas well, sunk in a mining district, will continue to be a menace to the mining of coal, for years to come. To avoid this danger the drilling of such wells should be thoroughly prescribed by law. On the abandonment of a well, the law should specify that the hole must be plugged solid, from the bottom to the surface, with a grouting of clay or other impervious material that would stop the flow of gas or oil through the hole. To avoid all possible danger, every such hole should be filled to the surface. It is not sufficient that the filling extend only to a supposed workable coal seam, as has been claimed by some drillers and prospectors.

In addition to the filling of a well-hole, on abandonment, the law should provide that a careful record shall be kept and filed in the County Recorder's office, showing the exact location of all holes drilled and giving their depth. For failure to comply with these requirements, the law should provide a suitable penalty. We shall be glad to have this question thoroughly discussed in *Coal Age* and suggestions made looking to effective remedies that will eliminate this danger in coal mining.

Ventilating With Compressed Air

Driving prospect entry with compressed air machines—Good ventilation afforded by reason of the air discharged from the machine.

WE ARE confronted, at the present time, with the problem of driving an air-course through a fault of erosion where the coal has been cut out for a distance of 70 ft. or more. The arrangement is such that the men driving this air-course will be, for a part of the time, some 200 ft. ahead of the air. We are using puncher machines, in this work, and I want to ask if it will be safe to ventilate this heading with the compressed air used to operate the machines. Some one has said that compressed air is harmful to the men; but I fail to understand what bad effect, if any, the compressed air would have on human life. I shall appreciate seeing your reply to this question in *Coal Age*, at an early date.

ANTON FRANKE, Gen. Supt.
Star Coal & Mining Co.
Freeburg, Ill.

There is no danger to be feared in ventilating an air-course or heading with the air discharged from machines operated by compressed air. The only ill effects experienced by workmen, in the use of compressed air, is where the men are compelled to work in a caisson, under an atmosphere of compressed air, which is not the case in the present instance.

The air discharged from these machines escapes as free air and affords excellent ventilation for the men driving the headings. When the machines are idle, or where the discharge is not sufficient to furnish good ventilation, it is customary to open a valve in the air pipe and allow more of the air to escape into the atmosphere.

In numerous instances in practice, headings have been driven several hundred feet, depending only on the ventilation afforded by the compressed air discharged from the machine, or allowed to escape from the air pipe. Many of our readers will be able to endorse this statement from their own experience and we shall be glad to hear from them.

Examination Questions Answered

Miscellaneous Questions

(Answered by Request)

Question—*A sump 10 x 12 x 22 ft. is being fed, by mine pumps, at the rate of 150 gal. per min., and is being emptied by a pump at the rate of 250 gal. per min. The sump being full and all pumps running, how long will it require to empty the sump?*

Answer—The cubic capacity of this sump is 10 × 12 × 22 = 2,640 cu.ft. There being 7.48 gal. in a cubic foot, the capacity of this sump is 2,640 × 7.48 = 19,747+ gal. Then, since the sump is being emptied at the rate of 250 — 150 = 100 gal. per min., the time required to empty the sump is 19,747 ÷ 100 = 197.47 min., or 3 hr. 17.47 min.

Question—*A car of coal was sold at $2.50 per ton, which was a profit of 20 per cent. Another car was sold at $2.50 per ton, which was at a loss of 20 per cent. Each car holding 50 tons, did he gain or lose and how much?*

Answer—The selling price of each car was 50 × 2.50 = $125. The first car being sold at a profit of 20 per cent, the selling price is 120 per cent of the cost. The cost was, therefore, 125 ÷ 1.20 = $104.16⅔, which shows a gain of 125 — 104.16⅔ = $20.83⅓. The second car being sold at a loss of 20 per cent, the selling price, in this case, is 80 per cent of the cost. The cost price was then $125 ÷ 0.80 = $156.25, showing a loss of $156.25 — 125 = $31.25. Finally, the net loss is, therefore, 31.25 — 20.83⅓ = $10.41⅔.

Question—*What effect will timber in a roadway have in the ventilation of a mine; and in what part of the airway will it last the longest and why?*

Answer—The timber in a roadway offers some obstruction to the passage of the air and, by increasing the resistance, reduces the circulation.

The timber on the intake airway will, generally speaking, last longer than that on the return airway, because it is less affected by the moisture of the mine, which invites fungus growth and shortens the life of the timber. Timber, on any airway or roadway in a mine, will last longer than timber in the rooms where it is subject to the increasing roof pressure, which crushes and destroys the timber.

Question—*A fan driven by a steam engine supplies air in a mine through several miles of air-course. A door is suddenly opened allowing the air to go directly from the airshaft to the escape shaft. Would there be a change in the operation of the fan? State reasons for your answer.*

Answer—The opening of the door short circuits the air and cuts out the mine resistance, which reduces the pressure and increases the quantity of air flowing through the fan. The work then absorbed in the fan is much increased by reason of the greater rush of air between its blades and the fan runs slower, assuming the power applied to the fan shaft remains constant.

Question—*What is meant by the term "deadhole"? What is meant by a windy shot?*

Answer—A deadhole, in blasting, is one in which the charge is located in such a manner that the line of least resistance corresponds more or less closely to the axis of the hole. In other words, the charge has no opportunity to free itself, except by blowing the tamping. A windy shot is one in which the force of the explosion is more or less expended on the air, instead of being wholly absorbed in breaking down the coal. A windy shot may only crevice the coal without breaking it down, but differs from a blownout shot in not blowing the tamping. A windy shot produces a heavy concussion on the mine air, which gives it its name.

Question—*In a mine having extremely tender roof, state what precautions you would adopt to insure the safety of the employees and economy of operation, where electric coal cutting machines are used.*

Answer—To insure the safety of the machine runners, when operating an electric coal cutter under a tender roof, it will be necessary to adopt some means of supporting the roof close to the face of the coal. A systematic system of timbering should be employed, setting the posts not more than three or four feet apart in rows parallel to the face. To insure safety, the first row of timbers should not be more than four feet from the coal and the distance between each row should not exceed the same amount. This however, will require that each post be removed and reset, as the machine advances along the face.

Preferably, the coal should be undercut with a shortwall machine, which will require less room for the machine to pass between the timbers and the coal. In order to avoid the necessity of drawing and resetting the timbers to allow the machine to pass, some will prefer cutting hitches in the coal face at the roof to support one end of a crossbar, the other end of which is rested on a prop standing 6 or 8 ft. back from the coal. At times, a heavy crossbar is supported on a single prop, as a boom projecting over the machine and reaching within two or three feet of the face of the coal.

Question—*There are eighteen rooms working on an entry. The miner in No.-10 room goes home, on account of sickness, early in the day and, later, you discover an explosive mixture of gases in his room. State what would be your method of procedure to protect the men and prevent an explosion.*

Answer—All entrances to the room should be barred, at once, on the discovery of the gas, and the men working in the adjoining places notified to leave their rooms. This being, done, and stationing a reliable man at the mouth of No.-10 room, all men working on that entry should be sent home for the day. No attempt should be made to remove the gas from the face of No.-10 room, until all the men have left the entry. The work of removing the gas should be in charge of a competent fireboss, who should be assisted with reliable men equipped with safety lamps.

Question—*In order to secure proper ventilation of the working faces, what velocity should the air current have at that point?*

Answer—The velocity of the air current, at the working face, should range from 3 to 5 ft. per sec. While a less velocity will not be generally sufficient to remove the gases and keep the faces clear, a greater velocity than this will often make the men uncomfortable, unless the mine is very warm, when a slightly greater velocity may be allowed.

Question—*Describe the conditions requiring that a mine be worked by improved electric lamps.*

Answer—Electric cap lamps are mostly regarded as the safest means of lighting the men while at work in a mine, whether that mine is generating gas or not. The lamp can always be used to advantage in a place generating gas, provided the working places have been and are examined at regular short intervals, by a competent fireboss equipped with a safety lamp, while the men are at work.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

FIGURES concerning the volume of employment in January, 1922, from representative establishments in 13 manufacturing industries and in bituminous coal mining compared with those of identical establishments for January, 1921, show that there were increases in the number of persons employed in 9 industries and decreases in the number of persons employed in 5 industries. The most important increases, 135.5 per cent and 114.9 per cent, appear in the automobile and woolen industries, respectively. Iron and steel shows a decrease of 21.5 per cent and car building and repairing a decrease of 16.1 per cent. The figures were tabulated by the Bureau of Labor Statistics of the U. S. Department of Labor.

When compared with January, 1921, the amount of the payrolls in January, 1922, show increases in 9 industries and decreases in 5 industries. Woolen shows an increase of 106.8 per cent and hosiery and underwear an increase of 91.6 per cent. Respective percentage decreases of 55.1, 37.5 and 30.5 appear in iron and steel, car building and repairing, and bituminous coal mining.

Comparative data for January, 1922, and December, 1921, show that in 4 industries there were increases in the number of persons on the payroll in January as compared with December, and that in 10 there were decreases. The largest increases are 2.5 per cent in boots and shoes, and 1.7 per cent in leather manufacturing. Cigar making shows a decrease of 13.6 per cent and iron and steel a decrease of 6.9 per cent.

When comparing January, 1922, with December, 1921, 2 industries show an increase in the amount of money paid to employees and 12 show a decrease. The two increases are 1.1 per cent in boots and shoes and 0.8 per cent in leather making. Percentage decreases of 35.8, 18.1 and 16.9 appear in automobiles, car building and repairing, and iron and steel, respectively.

During the period Dec. 15, 1921, to Jan. 15, 1922, there were wage changes made by some of the establishments in 10 of the 14 industries.

Woolen Mills Work Part Time

Part-time employment was reported for a number of mills in the woolen industry, causing the per capita earnings to be lessened 7.9 per cent in January.

Hosiery-Underwear Business Sags

On account of lack of business, less time was worked in the hosiery and underwear industry and the per capita earnings showed a decrease of 8.5 per cent when January figures were compared with December figures. Five establishments reported a decrease in wages of 12½ per cent, affecting all employees in the first establishment, 81 per cent in the second, 68 per cent in the third, and 62 per cent in the fourth. The number of employees affected in the fifth establishment was not stated.

Automobile Workers Earn Less

Some establishments in the automobile industry were partly closed during the month of January owing to lack of orders. A wage decrease of 15 per cent to all men was reported by one establishment. Two plants reported a decrease of 10 per cent, affecting the entire force in one, and 60 per cent of the force in the second. Sixty per cent of the men in one plant were cut 8 per cent in wages. When per capita earnings for January and December were compared a decrease of 31.7 per cent was shown.

Iron and Steel Output Lower

Part-time operation of iron and steel mills and reduction of forces resulted in decreased production. An increase in pay of 1½ per cent was granted to 64 per cent of the men in one plant. A reduction of 19 per cent was made to 4 per cent of the force in one mill, while another mill reduced the wages of 45 per cent of the employees 15 per cent. Twelve plants reported a decrease of 10 per cent, affecting all employees. In two mills a 2½ per cent cut in wages was made to 40 per cent and 10 per cent of the employees respectively. Four plants reported a decrease of 2 per cent, affecting 65 per cent of the men in the first plant, 60 per cent of the men in the second, 50 per cent of the men in the third, and 40 per cent of the men in the fourth. The per capita earnings for January were 10.8 per cent less than those for December.

Cut Wages of Silk Mill Operatives

Many silk mills were not operating to full capacity and the per capita earnings for January, when compared with those for December, show a decrease of 5.5 per cent. A decrease in wages of 12½ per cent was reported by 2 mills, affecting 95 per cent of the employees in one mill and 91 per cent in the second mill. Six mills reported a wage cut of 7½ per cent, affecting 95 per cent of the employees in 5 mills and 80 per cent of the employees in the sixth mill. A 10 per cent reduction was reported by one firm, but the percentage of employees affected was not stated, while 2 other firms made a decrease to 95 per cent of the employees.

Paper Makers' Earnings Decrease

A decrease of 1.2 per cent was reported for January per capita earnings in the paper-making industry as compared with those for December. A wage decrease of 18 per cent to 54 per cent of the force was reported by one plant, the wages of 58 per cent of the force in another concern were cut 17 per cent, and a wage rate decrease of 10 per cent, which affected 89 per cent of the employees, was reported by still another concern. Wage reductions ranging from 5 to 10 per cent were made to 68 per cent of the men in one mill. Another mill reported a wage rate decrease of approximately 15 per cent, but the number of men affected was not stated.

Car Building and Repairing Lag

Operations were partly discontinued in many car building and repairing plants, as fewer men were employed and less time worked. The per capita earnings for January were 13.4 per cent lower than those for December.

British Coal Exports During 1922 May Rival Those of 1913

Start Made Toward Recovery of Lost Foreign Trade After Most Disastrous Year in the History of Coal Industry

PRINCIPALLY because of the three months' strike the year 1921 was, perhaps, the most disastrous in the entire history of the British coal industry. But in spite of the difficulties of the country, production approached 160,000,000 tons and during the autumn months Great Britain made a start toward recovering lost foreign trade. The English view is that sacrifices have been so heavy in recouping these losses that the United States, which appears to have been ousted from many foreign markets, is not actually defeated and will return to the competing field during 1922. Prices on English coal, which began dropping early in the year, were hurried downward by the strike. Foreign demand absorbed so small a part of the country's production that prices now are down to one-quarter of the 1920 summer level, many collieries are closed and others are working short time.

The salient features of the strike through April, May and June are now pretty well known to the American industry, but various recent articles and utterances all indicate that if both sides had made their positions clear to each other and to the public, the settlement ultimately arrived at might have been made without closing at all.

The stoppage naturally aggravated the other troubles of the industry, chief of which was the almost total loss of the export trade, and home buyers learned new methods of coal economy. They consumed but 114,000,000 tons during the first eleven months of the year, including 3,000,000 tons imported. In 1913 home consumption totaled 189,000,000 tons.

When mining work was resumed, many of the foreign markets had disappeared entirely and factories could not restart owing to the high price of fuel. The industry was confronted with the problem of lowering prices to a marketable level without incurring bankruptcy. Since the beginning of the year the average pithead price has been reduced by nearly 15s. per ton and is still falling. Coal has been sold below cost to hold overseas trade.

GENERAL COAL POSITION FAR BEHIND THAT OF 1913

The general position of the coal industry is far behind that of 1913. In that year production was 287,412,000 tons. In 1921 a fair estimate preliminary to final compilations is 160,000,000 tons. During the first eleven months of 1913 the quantity of small coal exported was 15,978,810 tons, while during the corresponding period of 1921 it amounted to only 5,596,520 tons, or 35 per cent of the 1913 figure. The trade in "through" unscreened coal, which in 1913 amounted to 13,492,811 tons, decreased in a similar period of 1921 to 4,714,893 tons, or 35.5 per cent of the 1913 figure. The export trade in large coal in 1913 was 37,699,044 tons; in 1921 it was 10,039,979, or 26.5 per cent of the 1913 tonnage. Coal shipped for the uses of steamers engaged in foreign trade amounted in 1913 to 19,182,362 tons; in 1921 it had declined to 9,646,136, or 50.2 per cent.

There are indications that Great Britain is slowly but surely re-establishing itself in overseas markets. Spanish railways are insisting upon British coal in preference to Spanish because of its quality. Reports from Cape Town state that there is a steady falling off in the demand for bunker and export coal there.

In South America Britain is showing a decided growth against the United States. In 1913 the United Kingdom exported 6,900,000 tons to Chile, Brazil, Uruguay and Argentina, while the United States sent them but 367,000 tons. By 1920 the balance naturally was upset. The United States' exports to those countries totaled 3,444,000 tons and the United Kingdom's only 557,000 tons. But during the first months of 1921 the United Kingdom had sent 331,000 as against 1,000,000 tons from the United States.

Coal freight rates on cargoes from England to the River Plate have recently increased 19s. per ton. Reckoning the price of cargo coal to South America at 26s. the total cost would be 45s. American coal at $5 with freight at $4 costs a little over 46s. in South America. Thus the United Kingdom still has a slight advantage.

An estimate made in a Cardiff publication and reprinted in Commerce Reports, issued by the U. S. Department of Commerce, is that since British production should be high in 1922, and since home consumption may not exceed 125,000,000 tons, 1922 exports should equal those of 1913.

The extent to which the war and the campaign for the nationalization of the coal industry have handicapped development work in the mining districts is as yet little realized. Six important schemes for the sinking of pits in North Nottinghamshire were held up by the outbreak of war, four of which have not resumed. The two other enterprises which were launched at about this time have been resumed. Eighteen bores have been sunk in the northern part of the country at an estimated cost of £170,000. Eight could today be classified as successful, six doubtful, and the remaining four failures.

As far as outputs and costs are concerned it is the general opinion in Great Britain that output, which is now steadily climbing, will attain the pre-war rate within a few months, and that production costs and selling prices will fall gradually in 1922, though not to pre-war levels.

Severe industrial depression in Great Britain continues, but there are healthy signs of improvement, and this improvement will be assisted by government plans, but chiefly by the cheapness of industrial coal.

The executive committee of the Miner's Federation is to approach the owners through the National Board with the view of both parties making a joint representation to the Board of Trade in order to obtain an investigation into the causes, both political and economic, of the present situation in the industry with the object of getting some relief for the industry which would benefit those engaged in it, at the same time bringing additional advantages to the community. The miners have issued a table showing the parlous position of the workers in some districts. The owners have replied to this statement indicating that the figures given are misleading because:

1. In the statement no allowance is made for the coal supplied cheaply or free of cost to employees who are householders. This allowance is approximately equivalent to 1s. per day, or 6s. per week, and the supply of coal to these employees involves a loss to the colliery companies of about 15s. per ton, or £4,000,000 per annum.

2. The miners do not show the actual wages received by the men, but the minimum rates to which they are entitled. No allowance for bonuses is made.

3. The fact is not taken into consideration that the men are now paid the same rates for a seven-hour day as they were for the eight-hour day, and that pieceworkers were compensated for the shorter day by an increase of 14.2 per cent on piece rates.

The owners say that if present prices do not yield profitable results it is because of the high cost of production, which is, so far as it concerns labor, due to the reduction in working hours and diminished production. The present and pre-war positions in regard to output are shown in the appended table:

	1913			4 Weeks November, 1921		
District	Output Tons	Men Employed	Output per Man Tons	Output Tons	Men Employed	Output per Man Tons
South Wales...	4,546,000	233,000	20	3,600,000	214,000	17
Lancs, Cheshire and North Wales......	2,250,000	126,000	18	1,509,000	121,000	12
Northumberland.	1,185,000	61,000	19	806,000	52,000	16
Durham.......	3,322,000	166,000	20	2,276,000	145,000	16
Yorkshire	3,493,000	170,000	21	3,081,000	166,000	18
Derby, Notts and Leicester	2,696,000	111,000	24	2,104,000	122,000	17
Scotland	3,396,000	147,000	23	2,406,000	125,000	19

Though wages are low today relative to purchasing power, they are in amount considerably higher than in 1914, and yet, as will be seen in the above table, the value of the labor as measured in output is appreciably less.

Says Economic, Not Political, Means Will Stabilize Coal Industry

"THE article in *Coal Age* of Dec. 1 on 'Consumer Storage as a Means of Regularizing the Coal Industry' states some obvious truths," says Warren S. Blauvelt in a letter of recent date. He adds: "There is just one way of accomplishing the purpose, viz., make it more profitable for all concerned for consumers to store coal during the dull season, when transportation facilities are ample, keeping mines and railroad equipment steadily engaged, than to follow the practices which have prevailed in the past. Economic means will be effective, but political means will inevitably fail.

"You may possibly recall that in 1917, when coke prices were fixed, there was a differential of $1 a ton between the prices of foundry and furnace coke. At that time there were some seven or eight thousand industries engaged in essential work which required relatively small tonnages of coke, the total being only about 10 per cent of the country's output. On the other hand, there were some 350 blast-furnace plants which required 85 per cent of the country's production. Owing to lack of transportation facilities there was a shortage of coke from October, 1917, to May, 1918. As on the average it probably did not cost more than 60c. per ton to manufacture and load foundry coke than furnace coke it is obvious that the profit on foundry coke was greater. The effect was to relieve the Fuel Administration from the serious if not well-nigh impossible task of policing the movement for small shipments of coke to a vast number of essential industries, so that all energies could be concentrated upon the task of increasing production of furnace coke and supervising its distribution so that unnecessary stocks would not be accumulated at some furnaces and other furnaces be compelled to bank in consequence. The economic method worked very satisfactorily and undoubtedly cost less directly and indirectly and succeeded better than would any effort to accomplish the same purpose by exercising the police powers of the government.

"Of course the ordinary politician prefers to use political power rather than the forces of economic law. The latter is impersonal, adds nothing to his prestige and, if adopted, its very success tends to show what a blind leader the average politician has been.

"With these facts in mind I have attempted to formulate some rules which if adopted would utilize natural economic law to stabilize the production and distribution of coal and coke, and thus eliminate some of the wastes which are directly traceable to economic causes. I enclose for your criticism the results of my study of the subject."

Mr. Blauvelt suggests the following rules regarding car supply and freight rates intended to reduce wastes caused by irregular production, transportation and distribution of fuel:

"*Rule I: Car Distribution.*—For the equitable distribution of cars at coal mines and coke plants, and to stabilize their operation, every such operation shall have two car ratings. The ordinary car rating shall be determined by the daily production capacity of each operation. The primary car rating of each operation at any period shall be the average number of cars shipped by such operation during the preceding period, April 1 to July 31, inclusive. In case of car shortage, the distribution of cars shall first be made pro rata on the primary ratings; if additional empty cars are available they shall be distributed pro rata on the ordinary car ratings.

"*Rule II: Freight Rates.*—On or before April 30 of each year every railroad carrying coal or coke shall refund to each consignor by whom coal or coke was shipped during the preceding twelve months ending March 31, an amount which shall be calculated as follows:

"(1) Select the 30 consecutive day period of full car supply during the preceding year in which the minimum tonnage was shipped by each consignor from each operation to each destination zone via each routing.

"(2) Ten per centum of the freight charges on the portion of coal or coke shipped each month by each consignor from each operation to each destination zone, via any route, equal to the minimum monthly tonnage determined in (1) shall be the amount refunded to each consignor, provided that coal or coke was shipped by such consignor from such operation to such destination zone via the same route monthly for at least five consecutive months during the twelve months ending March 31.

"The purposes of these suggested rules are:

"1. To reduce the wastes of capital borne directly by operators and carriers and by them passed on to the consuming public, in providing and maintaining plant and equipment at least 30 per cent in excess of that required if such facilities were utilized at a reasonably uniform rate.

"2. To reduce the wastes of labor resulting from the irregular operation of mines, coke plants and transportation facilities.

"3. To reduce the prices of fuel to consumers by reducing wastes of labor and capital.

"4. To promote better industrial relations by stabilizing employment.

"These rules would employ the economic means to accomplish these purposes. They would increase the reward and reduce the risk involved in efforts to stabilize the production and distribution of fuel. They also would increase the risk and reduce the probability of obtaining profits by adopting practices which tend to cause violent price fluctuations, local fuel shortages, labor disturbances and constant appeals for political action which cannot solve an economic problem."

Operators' Association Urges Action to Reduce Prices of Mining Equipment

PRICES of mining equipment, machines, repairs, etc., including powder, have not been deflated to the extent that they should be, in the opinion of the executive committee of the Southern Appalachian Coal Operators Association. Believing that the coal industry had fully liquidated, as had most of the basic commodities, and that such lines as mine equipment, machines, supplies, etc., also should readjust prices, the following letter, signed by J. E. McCoy, secretary of the association, was addressed to manufacturers in those lines under date of Feb. 15:

"The attention of the executive committee of this association, in annual meeting Friday, Feb. 10, was called to the high price at which mining equipment, machines, repairs, etc., including powder, were now being sold.

"It was the consensus of opinion that the prices of such supplies had not been reduced or liquidated to the extent they should be. I was directed to call the matter to your attention and to state that it was felt the coal industry had fully liquidated, as had many of the other lines, including most of the basic commodities, and it was respectfully suggested that liquidation in lines represented by mine equipment, machines, supplies, etc., should be similarly adjusted.

"Our committee felt that you would appreciate having the matter brought to your attention for consideration and that you would be glad to do whatever, in your judgment, you thought to be the proper thing under all circumstances. It was felt very strongly that the price of machinery, equipment and supplies should be deflated in line with the deflation in coal and other commodities.

"Your acknowledgment and expression upon the subject will be appreciated."

For the purpose of obtaining the co-operation of the entire coal industry, if possible, in effecting the proposed deflation, Mr. McCoy has urged the secretaries of the various operators' associations to take similar action.

ANTHRACITE PRICE DIAGRAM NOT PARKER'S.—In *Coal Age* of Jan. 19, 1922, page 93, was published a diagram showing the course of spot prices of stove and buckwheat sizes of anthracite for the years 1913 to 1921. This diagram was drawn from the records of *Coal Age* and was published on the same page with an article on anthracite by E. W. Parker, director of the Anthracite Bureau of Information, without his knowledge. Mr. Parker had nothing to do with either the collection of the prices or their publication in this form.

Congress and Administration Favor "Hands-Off" Policy Toward Threatened Coal Strike

By Paul Wooton
Washington Correspondent of *Coal Age*

SENTIMENT in Congress and in the administration is strongly in favor of a "hands-off" policy in the matter of the threatened coal strike. The administration disclosed at the time of the threatened railroad strike that it is its policy to go to unusual ends to protect the public from the consequences of any strike. If the strike should assume such proportions as to constitute a serious public menace, there is no question that prompt action would follow. Feeling in the administration at present apparently is that the public has been forewarned and should be prepared to weather this disturbance. In the executive as well as the legislative branch of the government it seems to be the opinion that the most satisfactory settlement of the questions at issue can be effected best by those directly interested working in their own way. There is a general opinion that it will be better for all concerned if the matter is fought out at this time.

There can be no certainty, however, that Congress and the administration will keep hands off. Each of these agencies is sensitive to public pressure. If some development in the situation should result in a demand from the public for some form of government interference, there never is assurance that political expediency will not prompt action. This applies more particularly to Congress, and there is a safeguard there in that the legislative machinery works slowly and time is the best antidote for half-baked legislation.

No Significance Attached to Labor Department Move

No significance is attached to the announcement that the Secretary of Labor will attempt to get representatives of the miners and the operators together in a conference. This is the perfunctory step taken by the department to conciliate any labor dispute and is not regarded as any manifestation of administration policy.

Washington is divided into two groups of thought as to the strike possibilities. The line of cleavage is distinct. One group, which includes those who reflect the views of the operators, is positive that the country will not miss the coal production which the strike will stop. The other group, with which Secretary of Commerce Hoover may be numbered, foresees several months of disturbance. It is generally believed that the strike will be exceedingly stubborn in certain fields and in the anthracite region. It is fully expected, however, that there will be considerable coal coming out of some of the union districts before the strike has progressed far.

The car service section of the American Railway Association has been forehanded and is doing all within its rather limited authority to meet the serious problem certain to arise in the distribution of enough coal to keep the country going when it comes from a limited area and moves to unusual markets. It has been suggested that the Central Coal Committee be rehabilitated to handle the distribution, but it is recognized that the Interstate Commerce Commission will be slow in delegating any authority which will allow priorities in the movement of coal to certain places.

Anticipating the increase in coal production, the car service section began several weeks ago to urge the railroads to repair their coal cars. It was suggested that the bad-order cars which could be repaired at least cost and made available more quickly should be repaired first. As a result there has been a remarkable decrease in recent weeks in the number of bad-order coal cars. When production begins to approximate 10,000,000 tons, car shortages usually begin to develop. A telegraphic survey of the situation that has just been made, however, reveals that no serious car shortages are in immediate prospect. During the period of car abundance retailers in many instances have been taking their time to unload cars. Now it is being found difficult to secure prompt unloading. Nearly all railroads have sent bad-order coal cars to outside shops and have increased their own repair forces, with the result that each day is seeing a material increase in coal-car supply. The railroads serving non-union territory have been particularly active in ordering coal-car repairs and at this time have a particularly low percentage of bad-order coal cars.

Reports reaching Washington from certain of the union districts indicate that sentiment among the men is ripe for a defection from the union. The attitude of the public utilities and of manufacturers apparently is that the war-time rate of pay in coal mines must be deflated, so that the operators will have the moral support of those two groups. In addition, the indications are that there is little public sympathy for the attitude of the United Mine Workers.

Those who have been placing reliance on obtaining English coal in the event of a strike may be disappointed, as reports to the Department of Commerce indicate that the labor situation at the Welsh mines is critical, with prospects greatly favoring interruption in production. British exporters are known to be inquiring about purchases of American coal to take care of some of their South American commitments.

If the strike in the anthracite district should last as much as four months—and it is admitted that the chance is great for a stubborn struggle in that district—it would mean a great shortage of hard coal next winter. It would be absolutely impossible to bring production to normal regardless of the effort that might be put forth after the termination of the strike. If the strike can be settled within six weeks, it is believed that there will be no appreciable effect so far as consumers are concerned, but any cessation of production for a longer period will mean losses which cannot be made up. It is a matter of historical interest to note that the anthracite strike in 1902 lasted sixteen weeks; that of 1906, six weeks, and that of 1912, seven weeks.

Purchasing Agents Discuss Coal

COAL was the subject of discussion when the Purchasing Agents' Association of New York met at the Builders' Exchange Club on Tuesday evening, Feb. 21. President M. G. L. Harris presided, and after dinner and routine business he introduced O. P. Hood, of the U. S. Bureau of Mines, who gave an interesting talk on the purchase of coal by analysis. Mr. Hood stated that only the anaylses to be obtained through systematic sampling of delivered output in large quantities could be of value in determining the average quality of any coal.

Dr. Henry M. Payne then spoke on the efficient use of coal in average boiler plants, and recounted a number of experiences in power plants where a better working knowledge of conditions on the part of the purchasing agent would have averted much fuel trouble.

At the request of the executive committee of the association, Dr. Payne then detailed the work of the Anthracite Coal Consumers' Association, and by a series of graphs illustrated the railroad freight situation on anthracite. The graphs were distributed to the members present. Much interest was exhibited in the statement by Dr. Payne that while the Hampton Roads rate on bituminous coal, with an average haul of 403 miles, is $2.80 per ton, the rate on anthracite to New York, with an average haul of 155 miles, is $2.61 per ton.

J. G. **Bradley**, president of the National Coal Association, spent a day in Washington last week conferring with J. D. A. Morrow and the association's Washington officers.

I. C. C. to Investigate Bunker Coal Rates

ON its own motion the Interstate Commerce Commission has instituted an investigation into and concerning the propriety of rates on bunker coal from all points of origin to all ports of the United States, which are lower than rates from the same points of origin to the same ports on similar kinds of coal for local delivery there, not into vessels.

This investigation has been instituted because many of the carriers serving Atlantic ports make lower rates on coal to such ports for use in bunkering vessels than they make on coal to the same ports for local use, whereas carriers serving certain Gulf ports have not felt free to adopt this practice in view of decisions of the commission indicating that it is unlawful. The investigation will deal primarily with the lawfulness and propriety of the practice of discriminating in rates between coal delivered into vessels for bunker purposes and coal delivered at the port, not into vessels, for local use.

At the hearing, which has been scheduled for March 20, 1922, at Washington, D. C., before Examiner W. P. Bartel, the commission desires to obtain information concerning the following matters among others:

(1) To what ports are lower rates being applied on bunker coal than on coal for local or domestic consumption? Are such rates characterized as "transshipment" rates, "free on board vessel" rates, "bunker coal" rates, or otherwise?

(2) The methods of handling bunker coal at the various ports, i.e., whether unloaded from piers into vessels or lighters, and comparisons of the service with that performed on coal for local consumption.

(3) The approximate volume of bunker coal handled through each port.

(4) Facts tending to show whether or not the practice of according lower rates on bunker coal than on coal for local use results in unjust discrimination or undue prejudice and disadvantage.

There is a differential of 33c. against coal destined inside the Capes at Philadelphia in favor of coal going outside the Capes. In the case of Baltimore the differential is 40c., and at Hampton Roads 24c., while at New York there is no such preferential rate. Originally competition for coastwise New England business was the main reason for making a low outside Capes rate, although the classification, of course, includes "outside" bunkers. New York is not in position to cater extensively to the coastwise trade and no similar differential was applied at this port.

World's 1921 Coal Output, 1,100,000,000 Metric Tons, Fell to 1909 Level

WORLD production of coal in 1921 dropped back to the level of 1909. From reports so far received, the U. S. Geological Survey estimates the total output at approximately 1,100,000,000 metric tons. This figure is subject to material revision as more complete returns are available.

In comparison with the feverish year 1920, the year just closed shows a decrease of more than 200,000,000 tons. The chief factors in the decrease were the British miners' strike which lasted from April to June, and—more important—a worldwide industrial depression. Prices collapsed early in the year, and the sea-borne coal trade of the world fell off sharply. The consequent reduction in the volume of business offered to the shipping of the world has been an important element in the decline in ocean freight rates, so keenly felt by American shipping.

Of the major coal-producing nations, France and Germany were the only ones to show an increase. Progress in restoring the ruined mines of France is indicated by the steady increase in output of the past three years. In 1919 22,000,000 tons were produced; in 1920, 25,000,000; in 1921, approximately 29,000,000. A further increase of about 12,000,000 tons, however, would be necessary to bring French production up to the level of 1913. German production of bituminous coal also is still far below the pre-war level although an increase was effected in 1921 as against 1920. German production of lignite in 1921 reached the highest point ever attained. The estimated output of 120,000,000 tons is an increase of 33,000,000 tons over the last year before the war.

The proportion contributed by the United States was 40.9 per cent, a larger share than in the years before the European war, but the smallest in any year since 1916.

The following table, prepared by W. I. Whiteside of the Section of Foreign Mineral Reserves, presents the information received by the Geological Survey up to Feb. 15, 1922. The tonnage of the countries not yet heard from ordinarily amounts to 12 or 15 per cent of the total. Receipt of data for these missing countries, estimates for which are included in the total, may raise or lower the final figure by some millions of tons. A more complete report will be issued by the Geological Survey about April 1.

PRELIMINARY ESTIMATE OF WORLD'S COAL PRODUCTION IN CALENDAR YEARS 1919, 1920 AND 1921

(In metric tons of 2,204.622 lbs.)

Country	1919	1920	1921
Australia	10,736,321	13,176,426	(a)
Belgium	18,342,950	22,388,770	21,807,160
British India	22,991,217	17,356,889	(a)
Canada	12,411,328	15,088,175	13,300,000
China	23,000,000	19,500,000	(a)
Czechoslovakia	26,946,813	31,086,479	(a)
France	22,341,000	25,300,000	29,000,000
Germany—Coal	(b) 116,500,000	(b) 140,757,433	(b) 145,400,000
Lignite	93,800,000	111,634,000	120,000,000
Japan	31,461,386	29,245,384	(a)
Union of South Africa	9,313,232	11,181,846	(c) 9,400,000
United Kingdom	233,467,478	233,216,071	166,992,000
United States	502,534,410	586,000,000	448,600,000
Other countries	46,553,865	49,068,527	(a)
Totals	1,170,400,000	1,305,000,000	1,100,000,000

(a) Estimate included in total. (b) Includes Saar and Upper Silesia. (c) Estimated from 11 months' production.

Why One Coal Mine Was Idle

AMONG the statements and counter-statements with regard to the coal situation which have been published recently the assertion by miners' representatives that miners utilize their full opportunity to work has been often reiterated. In this connection a situation which developed at one of the mines in the Fifth and Ninth Districts Saturday, Feb. 11, causing the mine to stand idle, is related by W. K. Kavanaugh, president of the Coal Operators Association of the Fifth and Ninth Districts of Illinois.

"The mine employs about 230 men," said Mr. Kavanaugh, "and hoists about 1,200 tons a day, and when loading in railroad cars loads about 24 to 26 cars. The miners at this mine have agreed among themselves that unless seven empties are at the mine in the morning they will not go below for fear of being inconvenienced in starting work and finding themselves unequipped with railroad cars and unable to continue. When the men came to work Saturday, Feb. 11, this mine had no railroad cars in the yard. The company, however, did not want to load railroad cars that day but desired to place the entire day's output on the ground for storage, consequently it was unnecessary that any railroad cars be available. The superintendent guaranteed the men a full day's work if they would go below. The men held a consultation among themselves, however, and decided that the ruling they had made to the effect that the men would not work unless there were at least seven empties in the yard held good and for that reason the men refused to go to work below."

Preston County Operators Reduce Wages

TO put their mines on a basis under which they can compete with those operating in other fields and without waiting for action in any other section of northern West Virginia, Preston County operators with mines near Kingwood, W. Va., have adopted a new wage scale and are now paying their men in accord with it, some of the rates being as follows:

Pick mining, headings, 60 to 65c. per ton; pick mining, rooms, 55c. a ton; drivers and trackmen, $3; motormen, $3.12; blacksmiths, $3.75; trappers, $1.75; engineers, $3.24; firemen, $3.12; trimmers, $2.50; unspecified inside labor, $2.80; unspecified outside labor, $2.50. All the day rates are based on a day of eight hours.

Operators' Attitude Toward Wage Conference Unchanged

Southern Ohio Producers Decline to Attend—Pittsburgh Employers Expected to Take Similar Position—Eastern Ohio, Illinois and Indiana Mine Owners Reluctantly Agree to Interstate Parley

RESPONSE of the operators to John Lewis' second call for a conference at Cleveland on March 2 between the United Mine Workers and representatives of producers in the Central Competitive Field, issued on Feb. 20, two days after the close of the miners' convention at Indianapolis, so far has introduced nothing new into the situation.

Following the policy announced early in January, southern Ohio operators have flatly declined to attend a conference. Pittsburgh is expected to take the same position; eastern Ohio, Illinois and Indiana have indicated a reluctant willingness to meet in an interstate conference if Mr. Lewis can arrange it. In a statement issued last week the Illinois operators disclaim any desire to forego collective negotiations with their men, stating they have never refused such conferences with their own men, but they are opposed to the four-state conference. They indicate that the only purpose of an interstate meeting now would be to discuss with Mr. Lewis the question of an interstate wage settlement, to which the operators are opposed. The statement discloses that there are two prime reasons for this attitude:

"The first is the apparent legal obstacle developed as a result of the Indianapolis indictment. The second is the fixed belief, held quite generally by coal men throughout the country, that mine labor as well as organized labor in other industries are demanding negotiation in unwieldy units. Adequate and proper representation for wage agreement negotiations for such large areas give a conference body of such size and diversified opinion that the original intent and purpose of collective bargaining is made impossible.

"This is not a new idea either with the operators. It is based on ample precedents of which the public have apparently already approved. The United States Steel Corporation, through Judge Gary, refused to negotiate with others than his own employees. The railroads of different sections of the country have sought and clamored for permission to negotiate and adjust wage matters with their own employees or at least in their own localities, which latter they are now doing in regional conferences inaugurated by Secretary Hoover. Nor could there be given any clearer evidence than the recent demonstration of railroad labor of the futility of such massive and countrywide effort on the part of organized labor attempting to force the continuance of an unnatural wage level through sheer strength and an alleged ability to paralyze all industry through the use of so-called 'economic power.'"

In answer to the request of Mr. Lewis for a meeting at Cleveland the Illinois operators wrote him on Feb. 21, stating: "We have well-defined ideas as to what we can and are willing to pay our miners and day laborers, and conditions under which we are willing to make a new agreement, and we are prepared at any time to discuss these questions collectively with all of the other operators and miners of the Central Competitive district, when such a meeting has been agreed upon in accordance with resolution passed in New York City, March 31, 1920, and to which you refer in Dec. 16, 1921, letter."

The position of the Indiana operators has not been so clearly stated, but it is understood to be that the Cleveland meeting requested by Mr. Lewis would be useless because some of the fields have refused to take part. The Indiana operators met in executive session at Terre Haute on Feb. 22, but made no announcements of policy.

After a meeting on Feb. 23 Michael Gallagher, president of the Pittsburgh Vein Operators' Association of Ohio, telegraphed John Lewis that the position of the operators in that field was unchanged from that in early January, adding "but if President Lewis is able to obtain a meeting at which the operators of the four states comprising the Central Competitive Field will all be represented, this association will send representatives to such a meeting."

There is no equivocation in the reply of the operators of the southern Ohio field. W. D. McKinney telegraphed Lewis that "conditions in this district can only be remedied by a meeting of the representatives of operators and miners of southern Ohio who are affected by the prevailing conditions. Operators of southern Ohio are therefore willing to meet with representatives of southern Ohio miners and agree on a scale to meet that situation."

Charging "Hold Up" by Coal Men, Opposes Funds for Fuel Investigations

COAL prices were discussed before the House Appropriations Committee when Director Bain of the Bureau of Mines appeared in support of funds for coal investigations next year, Representative Cramton, of Michigan, in charge of the bill, taking the position that as the coal industry had "held up" the country, Congress should not spend time or money in investigations in its behalf. Director Bain defended the coal investigations as necessary to build up the coal export trade and stabilize the industry.

The Director referred to the work at the Pittsburgh station in sampling and analyzing fuels for government agencies. He said that in addition to studies of fuels, investigations were made as to conditions under which they were burned. Loss in fuel burning was due to poor combustion, which was shown by production of smoke. Work had been carried on in lessening the smoke nuisance.

"There is need to investigate more fully the methods of storing, handling and transporting coal to build up our foreign markets and to ship a better quality of coal to the consumer," said Director Bain, in asking for $5,000 for a chemical fuel expert who would conduct this work in co-operation with the Bureau of Foreign and Domestic Commerce. Dr. Bain pointed out that American coal exporters must face foreign competition and also combat the charge that American coal is inferior to the product of British mines. He said that foreign competition had extended to the point where low-grade coal was bought in Constantinople and mixed with American coal and sold as American coal, to the detriment of the American industry.

Director Bain stated that the country required the export trade and if we could export our surplus coal it would stabilize the coal industry and help business in general as the present instability of the coal industry hurt all business.

He also said that the coal mining industry was seasonal, the men not working regularly, but that if the government could find a way to develop the export coal trade it would act as a real stabilizer to keep the mines operating in periods of slack domestic demand.

Representative Cramton replied that as the coal people were "holding up" the public he did not see why Congress should consume time or spend money in helping them, and added that increased foreign trade would make conditions worse for the domestic coal consumer, as the foreign trade would be used as a "club" on the domestic trade.

Director Bain pointed out that the drop in coal exports had affected West Virginia and also caused the price of coal to drop, adding that West Virginia coal could be purchased now cheaper than last year. "There are many mines shut down, capital idle and men idle," said the Mines Director, "which is a cost which has to be met some time and somehow. The people who buy coal will ultimately have to pay the cost. The depression in the industry is not good for the men or the country as a whole."

Peabody and Other Midwestern Companies to Withdraw From National Coal Association

THE Peabody Coal Co., of Chicago, and a number of other coal interests of the Middle West will withdraw from the National Coal Association on April 1 or sooner. The cause is variously assigned but in general the affected operators are dissatisfied with the service they are able to get from the association. The Wilcoxson Coal & Coke Co., the Peerless Coal Co. and the Consolidated Coal Co., of St. Louis, also are among those which are about to withdraw.

The Peabody company, which is also withdrawing all of its subsidiaries from the National, will, if its counsel, Silas Strawn, advises, give up memberships in all other coal trade associations, remaining only in those associations whose primary purpose is to handle labor problems.

"The only reason for our action," explained Vice-President George Reed of the Peabody company, "is that we believe the National cannot be of any further service to us. That's all there is to it. There is no ulterior motive. There was a time during the war and immediately thereafter when the National could and did make itself of value to us by interpreting the income tax laws and by representing us at Washington when all sorts of coal legislation was before Congress. But that time has passed."

The only comment F. S. Peabody added was that "the younger men" in his organization had advised the action and that about $27,000 in membership dues would be saved.

Peabody subsidiaries include the following: Superior Smokeless Coal & Mining Co., Big Muddy Fuel Co., Southern Counties Coal Co., By-Products Coke Corporation, Manufacturers' Coal & Coke Co., Black Mountain Corporation, Springfield District Coal Mining Co., Sheridan Wyoming Coal Co., and Federal Coal Co.

Kanawha Operators Issue Ultimatum

KANAWHA operators served notice Feb. 24 on District 17, United Mine Workers, that if the union puts off meeting the operators after March 11 a new wage scale will be posted and that the operators will not consider the check-off. The producers passed resolutions declaring against the check-off and favoring the open shop. So far the miners have refused a conference, waiting for Central Competitive settlement and a new scale, despite efforts of Kanawha operators to arrange a conference.

Philadelphia Coal Club Has Annual Dinner

THE annual dinner of the Philadelphia Coal Club was held at the Hotel Bellevue-Stratford, Philadelphia, Feb. 27, about 400 members and guests being present. Noah H. Swayne, 2d, was toastmaster. Owen J. Roberts, of the Philadelphia Bar, addressed the members, urging the necessity of "Less Government Regulation in Business." Carter Helm Jones, D.D., spoke on "Civic Pride" and Francis H. Sisson, New York banker, outlined economic principles to offset the financial reverses following the World War.

Officers for the following year are: Noah H. Swayne, 2d, president; Pratt Thompson, vice-president; Charles K. Scull, secretary-treasurer. Directors: Walter D. Bush, Jr.; Samuel B. Crowell, Walter C. Hancock, John E. Lloyd, James M. Kelley, Frank F. Mathers, Reuben B. Platt, George P. Quigley, William L. Scott, Edward R. Simpson, William J. Steen, Henry E. Strathmann, Jr.; C. H. Peacock, Arthur Kuppinger and H. K. Cortright.

Bids for New York City Department Coal Exhibit Striking Variations

BIDS RECEIVED by the Board of Purchase of the City of New York on Feb. 16 for furnishing and delivering to three city departments various tonnages of semi-bituminous and No. 1 and No. 3 buckwheat coals showed a variety of prices. For delivering to the Department of Plant and Structures alongside the municipal ferry, at St. George, Staten Island, 13,000 net tons of No. 1 buckwheat there were eight bidders, as follows:

Majestic Coal Co., $5.97; Weston Dodson & Co., $6.53; Burns Bros., $5.69; V. H. Youngman & Co., $6.62; Commonwealth Fuel Co., $5.53; Intercity Fuel Co., $5.62; Penn Fuel Co., $6.57; H. B. W. Haff (informal), $7.05; A. A. Smith & Co., Bayonne, N. J., $6.98.

For the Department of Water Supply, Gas and Electricity the following bids were received:

Jerome Avenue Pumping Station, the Bronx—500 net tons No. 3 buckwheat: Whitney & Kemmerer, $5.48; V. H. Youngman & Co., $5.98; Burns Bros., $7.32. Five hundred net tons semi-bituminous: Whitney & Kemmerer, $6.64; Youngman & Co., $7.18; Burns Bros., $5.99.

Ridgewood Pumping Station, Brooklyn—4,500 net tons semi-bituminous run-of-mine: G. D. Harris & Co., $5.84; Whitney & Kemmerer, $5.97; Commonwealth Fuel Co., $6.19; Gavin Rowe, $6.17; Burns Bros., $6.13; Weston Dodson & Co., $6.07; F. M. A. Leach, $6.18; B. Nicoll & Co., $6.07; Majestic Coal Co., $6.37.

Milburn Pumping Station, Baldwin, L. I.—1,500 net tons semi-bituminous run-of-mine: G. D. Harris & Co., $6.60; Gavin Rowe, $7.66; Commonwealth Fuel Co., $6.83; B. Nicoll & Co., $6.731; Majestic Coal Co., $6.24.

Massapequa Pumping Station, Massapequa, L. I.—600 net tons semi-bituminous run-of-mine: G. D. Harris & Co., $6.76; Commonwealth Fuel Co., $6.47; Gavin Rowe, $6.86; Weston Dodson & Co., $6.45; F. M. A. Leach, $6.79; B. Nicoll & Co., $6.463; Majestic Coal Co., $5.98.

Department of Correction, New York City Reformatory, Hampton Farms, Orange Co., N. Y., delivered f.o.b. siding New Hampton, 200 net tons semi-bituminous run-of-mine: G. D. Harris & Co., $6.56; Whitney & Kemmerer, $6.69; Commonwealth Fuel Co., $6.39; Burns Bros., $7.72; Weston Dodson & Co., $6.20; F. M. A. Leach, $6.39; B. Nicoll & Co., $5.67; Majestic Coal Co., $6.46. Six hundred net tons No. 3 buckwheat: Commonwealth Fuel Co., $3.88; Burns Bros., $4.59; Weston Dodson & Co., $4.92.

654 Companies Obtain Average Margin of 10c. Per Ton on Bituminous Coal

TONNAGE produced, average costs and prices received for bituminous coal, f.o.b. mines, mine-run basis, by 654 operating companies reporting to the National Coal Association, by months in 1921, according to data introduced by the National Coal Association in hearings before the Interstate Commerce Commission, Feb 28, 1922, were as follows:

		—Total Received—		—Total Cost—		
Month	Production (Net Tons)	Dollars	Average Per Ton	Dollars	Average Per Ton	Margin Per Ton (a)
January	13,760,621	$50,098,578	$3.64	$42,529,059	$3.09	$0.55
February	10,580,327	36,893,419	3.49	34,483,970	3.26	.23
March	10,505,457	35,899,329	3.42	33,971,972	3.23	.19
Total, 3 mos.	34,846,405	122,891,326	3.53	110,985,001	3.18	.35
April	9,238,059	29,457,386	3.19	30,114,706	3.26	—.07
May	11,978,174	36,613,419	3.06	34,849,555	2.91	.15
June	11,754,664	34,853,274	2.96	34,200,553	2.91	.05
July	9,946,896	29,001,018	2.92	29,877,165	3.00	—.08
August	11,384,236	32,773,861	2.88	31,825,867	2.80	.08
September	11,474,324	31,999,430	2.79	31,499,292	2.74	.05
October	14,175,260	38,734,260	2.73	36,123,188	2.55	.18
Total, 7 mos.	79,951,613	233,432,648	2.92	228,490,326	2.86	.06
Total, 10 mos	114,798,018	356,323,974	3.10	339,475,327	2.96	.14
November (b)	10,669,823	28,499,819	2.67	29,026,626	2.72	—.05
December (c)	7,941,392	20,357,556	2.56	23,058,735	2.90	—.34
Total for yr.	133,409,233	405,181,349	3.04	391,560,688	2.94	.10

(a) Margin is not the same as profit. From the margin must be paid all federal income and excess profits taxes and interest on bonds and borrowed money.

(b) Six hundred and thirteen companies only.

(c) Five hundred and eleven companies only.

Appeal in Pennsylvania Tonnage Tax Case

APPEAL to the Supreme Court of Pennsylvania was taken Monday, Feb. 20, from the decision of the Dauphin County Court of that state, which upheld the constitutionality of the Williams anthracite tonnage tax. It is hoped to have the appeal advanced on the Supreme Court list so that it may be argued before the May session.

Miners' Policy Committee May Avert Threatened Strike

Powers Given to Meet "Unforeseen Circumstances" May Play Important Part in Settlement—Alliance with Railroad Men Carries Only "Moral Support"—Lewis Says Strike Vote Is Purely Formal

By E. W. Davidson

ON THE face of things the developments of the past week point inevitably to a general mine strike April 1 unless the new move by the U. S. Department of Labor succeeds in staving off a tie-up. A sort of miner-railroader alliance was made at Chicago. The post-convention efforts of John L. Lewis, president of the United Mine Workers, to arrange a wage conference with the operators of the Central Competitive Field having failed of widespread acceptance, the union locals of the land are voting power to their International officers to call a strike if no wage agreement is made by midnight of the last day of March. But the country must not lose sight of the policy committee of the miners, created at the Indianapolis convention. It puts the "but" in every consideration of the situation.

This "but board" is endowed with a good deal of power to meet "unforeseen circumstances" between now and midnight of March 31. There are all sorts of "unforeseen circumstances" possible, despite the fact that President Lewis left Chicago Friday morning saying the miners had already done all that they could toward trying to get a wage conference and that the next move would have to come from the operators.

During the week, however, the last of the Central Competitive operators' associations apparently had already made their "next move," Illinois alone having voted to meet the miners, Indiana and eastern Ohio agreeing to attend a conference if all other associations in the Central Field would, while Pennsylvania and Southern Ohio definitely refused to attend. Thus a deadlock appeared to have been reached.

Railroad Brotherhoods Lend Moral Support

Just how much effect the alliance between the United Mine Workers and the railroad brotherhoods will have remains to be seen. "We do not ask the railroaders to go on a sympathetic strike to help us," said President Lewis when the conference was going on in Chicago Wednesday, "but we do ask their moral support." That is about what was obtained.

After the conference this statement was issued:

"The associated organizations represented in the transportation and mining industries of the country have been compelled to bear the brunt of unwarranted attacks upon their integrity and unjust and inequitable changes in their wage schedules and conditions of employment. The industrial and financial interests responsible for this condition are not yet satisfied and are conducting gigantic propaganda looking toward further wage reductions and additional changes in working conditions that will be detrimental to the people employed in these industries. It, therefore, becomes necessary for the representatives of the associated organizations to assemble and take cognizance of this situation. Impelled by the necessity of effecting a co-ordination of our strength we declare for closer co-operation of our forces, which will operate to more effectively protect the interests of those engaged in these essential and basic industries. After mature deliberation, and with a full sense of our responsibility, we declare that the mutuality of interests of the employees in these basic industries must be recognized and we assert our purpose to apply every honorable method to secure adequate compensation for service rendered and to maintain proper American standards of living.

"When it becomes apparent that any one or group of the associated organizations, is made the victim of an unwarranted attacks, or its integrity is jeopardized, it will become the duty of the representatives of each of the associated organizations to assemble to consider the situation. Ways and means may then be considered and applied to best meet the emergency. Action taken under this section is subject to approval by each organization represented.

"To facilitate the conduct of the business of the associated organizations an executive committee is hereby created composed of the chief executives of the associated organizations, or their specifically designated representatives. It shall be the duty of the executive committee from time to time to make such recommendations to the associated organizations as may in its judgment be deemed wise and to assemble the full conference of associated organizations when conditions make such action necessary.

"This plan shall become operative when ratified by the constitutional authorities of each associated organization."

Secretary Hoover, of the Department of Commerce, who was in Chicago on another mission while the conference was going on, declined to make any statement on the possibility of government intervention in the coal situation.

The strike vote now being taken among the miners, President Lewis explained, is purely formal and merely carries out the will of the convention. He sent out the vote order after it became apparent that his latest effort to get the operators into four-state conference had failed. The referendum vote must be reported to headquarters between March 10 and 15. The men are not voting positively to strike, but only to authorize the International officials to order a strike if the new wage agreement is not made when the deadline is reached. This maneuver is to relieve the officials of the charge, frequently made in the past, of plunging the union into difficulties without giving the "rank and file" a voice.

Anthracite Operators Consent to Wage Conference in New York

Warriner Says Further Action Is Contingent on March 15 Meeting—Still Contends There Must Be Deflation in Wages

AT THE conclusion of a two-day conference of the policy committee of the Anthracite Operators Association, in Atlantic City, announcement was made Saturday, Feb. 25, that a conference would be held with the miners in New York City on March 15. The conference was urged in a letter received in the morning of that date from John L. Lewis, president of the United Mine Workers of America. S. D. Warriner, of Philadelphia, president of the Lehigh Coal & Navigation Co., who is chairman of the policy committee, said that future action would be contingent on the developments at the New York conference.

Mr. Warriner indicated that the miners would be asked to readjust the present wage rates. The present situation is one, Mr. Warriner said, in which the price of anthracite coal cannot be expected to deviate from the trend of other commodities. There must be deflation, he added, not only in wage rates but in freight rates, as well as in other things.

Mr. Warriner would not say whether or not the operators had agreed upon a definite wage basis to be submitted to the miners as a counter proposal to the miners' demands that the contract wage scale be increased 20 per cent and that all day men be granted an increase of $1 a day.

Production and the Market

Weekly Review

CONSUMER inquiries are the order of the day but the amount of actual business transacted did not increase much last week. The prospect of some kind of an alliance between mine and railroad labor unions and the determination of mine operators to force a showdown in the coming wage struggle have done much to awaken the buyer of coal to the situation, and inquiries for prices are increasing daily. Purchases are still limited, however, the inference being drawn that while there is an urge to prepare for the situation that may have to be faced April 1, there is still time to shop around.

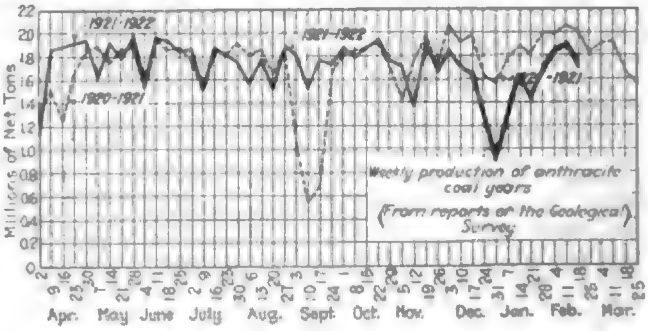
Production has more than equalled demand and while future quotations have an upward trend the spot market feels the effect of the heavy offerings. *Coal Age* Index of spot bituminous coal prices was 180 on Feb. 27, as compared with 182 for the week of Feb. 20. Much depends upon the length of the union tie-up. Railroads and public utilities are actively engaged in stocking coal but the rank and file of consumers are trying to gage the probable duration of the mining interruption, not wanting the settlement of the strike to find them with unnecessarily heavy reserve stocks.

Non-Union Supply Precludes Runaway Market

A runaway market seems improbable, considering the sufficiency of non-union tonnage. Under the impetus of spring trade, however, present industrial tendencies are likely to moderately increase the amount of fuel needed for current use. Any interruption to this manufacturing activity would entail an industrial loss much out of proportion to the difference between present and expected fuel costs.

Some of those who are advocating a delay in taking strike safeguards point to the availability of English coal as one justification of this course in the event of a prolonged controversy. Recent reports emanating from Washington, however, are to the effect that the British also are having their share of labor troubles. There is considerable unrest among Welsh miners and a stoppage in some sections of the British fields is by no means unlikely.

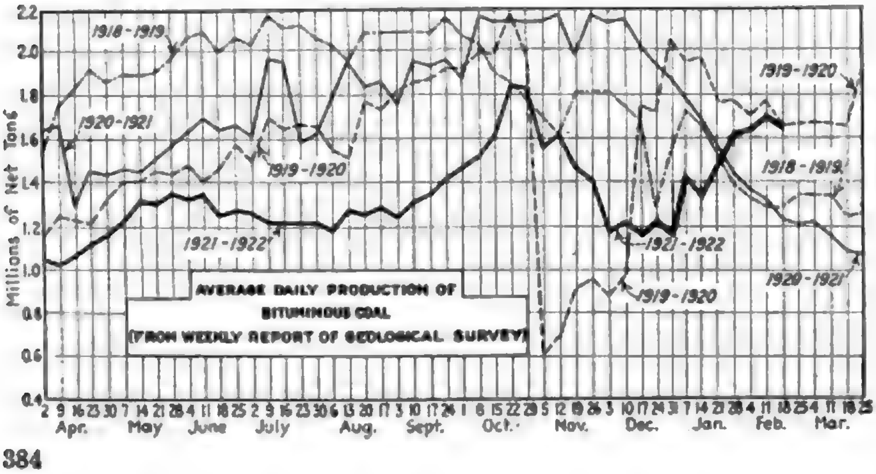
Independent anthracite producers are feeling the effects of a more quiet market. A temporary spurt was experienced with more wintry weather but the demand soon subsided. Dealers are not keeping their stocks replenished and small orders are the outlook for the balance of the season, as the retailer desires to clean up yard stocks before April 1. Barley is the shortest of the steam coals, which still continue to move easily.



A conference of miners and anthracite operators will be held in New York City March 15. This announcement was made last week following the adjournment of the policy committee meeting of the Anthracite Coal Operators' Association at Atlantic City.

BITUMINOUS

Production of bituminous coal dropped back slightly during the week ended Feb. 18, according to the Geological Survey. The output was 10,167,000 net tons as compared with 10,317,000 tons in the preceding week. Even with the lowered production the output was much above the level of current needs and probably not less than one million tons went into storage. To build a strike reserve equal to that on the day of the Armistice about 16,000,000 tons would



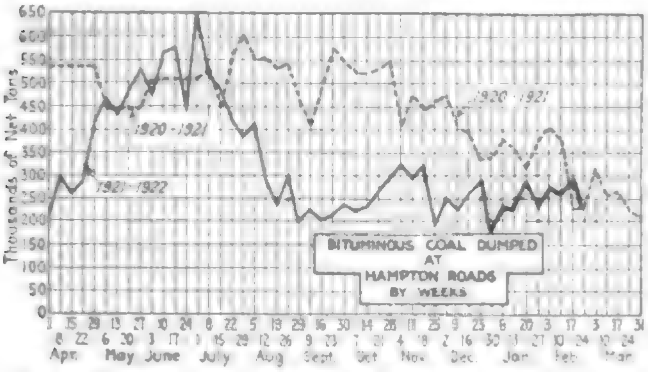
Estimates of Production

(Net Tons)

BITUMINOUS		
	1921–1922	1920–1921
Feb. 4 (*b*)	9,714,000	8,132,000
Feb. 11 (*b*)	10,317,000	7,859,000
Feb. 18 (*a*)	10,167,000	7,489,000
Daily average	1,695,000	1,248,000
Coal year	370,925,000	481,929,000
Daily aver. coal year	1,366,000	1,773,000
ANTHRACITE		
Feb. 11	1,822,000	2,048,000
Feb. 18 (*a*)	1,703,000	2,010,000
Coal year	75,973,000	79,958,000
COKE		
	1922	1921
Feb. 11	128,000	228,000
Feb. 18	135,000	219,000
Calendar year	841,000	1,724,000

(*a*) Subject to revision. (*b*) Revised from last report.

have to be put into reserve bins. That a further slump in the following week was unlikely is indicated by the fact that loadings on Monday and Tuesday of that period were increased 5 per cent over the corresponding days of the previous week.



Hampton Roads dumpings were 234,591 net tons during the week ended Feb. 23, as compared with 296,000 tons in the preceding week. The decrease was mainly caused by the observance of Washington's Birthday, as coastwise business is holding its own and bunkers are stronger. Pier accumulations are less.

About the only effect of the strike talk in the Midwest has been to bring about what in ordinary times would be called a normal steam demand. Southern Illinois producers, in an effort to meet non-union competition and to induce some stocking, have reduced domestic prices 40c. a ton. The householder is displaying an indifferent attitude to the strike situation, and domestic distribution, while better, is still a day-to-day affair, largely influenced by the weather. Fine coals are stronger in this and other sections, but the rise in price is about discounted by the reduction necessary to move domestic tonnage.

A severe blizzard in the Northwest produced many rush orders, but deliveries were hampered by adverse weather conditions. Stocks are being replenished in a cautious way, but prices show no great strength except on screenings, which are in short supply. Winter trade had established some low prices, however, which are now fast disappearing.

New England buyers are less interested than two weeks ago. Reserves have been obtained and a quiet market is in prospect. The textile strike has reduced the demand and light consumption in other lines indicates a long spell of slow business. Marine freights feel the slack buying and have fallen from the high point reached a fortnight ago.

Shipments through the five rail gateways for New England consumption were 3,368 cars during the week ended Feb. 18, 400 cars less than the week before. All-rail shippers

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Jan. 30 1922	Feb. 13 1922	Feb. 20 1922	Feb. 27 1922†
Pocahontas lump	Columbus	$3.30	$3.35	$3.25	$3.15@$3.40
Pocahontas mine run	Columbus	2.15	1.90	2.10	**2.00@2.25**
Pocahontas screenings	Columbus	1.55	1.40	1.55	*1.25@1.60*
Pocahontas lump	Chicago	2.85	3.15	3.15	2.75@3.50
Pocahontas mine run	Chicago	2.15	2.25	2.15	1.75@2.50
Pocahontas lump	Cincinnati	3.15	3.15	3.15	3.00@3.25
Pocahontas mine run	Cincinnati	2.05	1.85	1.75	1.75
Pocahontas screenings	Cincinnati	1.40	1.15	1.15	1.00@1.25
*Smokeless mine run	Boston	4.70	4.80	4.55	**4.60@4.70**
Clearfield mine run	Boston	1.95	1.95	1.95	1.65@2.25
Cambria mine run	Boston	2.45	2.45	2.45	2.25@2.60
Somerset mine run	Boston	1.90	1.90	1.90	1.75@2.00
Pool 1 (Navy Standard)	New York	2.85	3.00	3.00	2.75@3.25
Pool 1 (Navy Standard)	Philadelphia	3.00	3.05	3.05	2.85@3.25
Pool 1 (Navy Standard)	Baltimore	2.70	2.60	2.55	**2.60@2.75**
Pool 9 (Super. Low Vol.)	New York	2.20	2.45	2.50	*2.20@2.65*
Pool 9 (Super. Low Vol.)	Philadelphia	2.40	2.45	2.45	2.20@2.65
Pool 9 (Super. Low Vol.)	Baltimore	2.45	2.30	2.25	**2.25@2.50**
Pool 10 (H. Gr. Low Vol.)	New York	2.05	2.10	2.10	*1.90@2.10*
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.00	2.10	2.10	1.95@2.20
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.05	2.05	2.05	**2.05@2.15**
Pool 11 (Low Vol.)	New York	1.65	1.75	1.75	1.65@1.85
Pool 11 (Low Vol.)	Philadelphia	1.70	1.75	1.75	1.65@1.85
Pool 11 (Low Vol.)	Baltimore	1.95	1.75	1.75	**1.85**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.40	1.50	1.50	1.40@1.60
Pool 54-64 (Gas and St.)	Philadelphia	1.50	1.50	1.50	1.40@1.60
Pool 54-64 (Gas and St.)	Baltimore	1.65	1.40	1.40	1.35@1.45
Pittsburgh sc'd. gas	Pittsburgh	2.65	2.65	2.65	2.60@2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@2.20
Pittsburgh slack (Gas)	Pittsburgh	1.75	1.65	1.65	1.60@1.70
Kanawha lump	Columbus	2.50	2.65	2.65	*2.50@2.75*
Kanawha mine run	Columbus	1.65	1.65	1.65	*1.50@1.75*
Kanawha screenings	Columbus	1.15	1.35	1.30	**1.25@1.50**
W. Va. Splint lump	Cincinnati		2.65	2.35	*2.85*
W. Va. Gas lump	Cincinnati	2.45	2.00	2.05	*1.85*
W. Va. mine run	Cincinnati	1.35	1.60	1.50	*1.25@1.50*
W. Va. screenings	Cincinnati	1.05	1.30	1.20	**1.25@1.35**
Hocking lump	Columbus	2.50	2.75	2.65	*2.50@2.65*
Hocking mine run	Columbus	1.90	1.90	1.90	1.75@2.00
Hocking screenings	Columbus	$1.25	$1.35	$1.30	**$1.40@$1.60**
Pitts. No. 8 lump	Cleveland	3.05	3.10	3.10	3.00@3.25
Pitts. No. 8 mine run	Cleveland	2.00	1.95	1.95	**1.95@2.00**
Pitts. No. 8 screenings	Cleveland	1.55	1.65	1.65	**1.70@1.85**
Midwest					
Franklin, Ill. lump	Chicago	3.65	3.65	3.30	*2.85@3.65*
Franklin, Ill. mine run	Chicago	2.35	2.50	2.50	2.25@2.75
Franklin, Ill. screenings	Chicago	1.90	1.95	2.00	1.75@2.25
Central, Ill. lump	Chicago	3.00	3.00	3.00	2.75@3.25
Central, Ill. mine run	Chicago	2.35	2.35	2.35	2.25@2.50
Central, Ill. screenings	Chicago	1.50	1.75	1.80	1.70@1.90
Ind. 4th Vein lump	Chicago	3.25	3.25	3.25	3.00@3.50
Ind. 4th Vein mine run	Chicago	2.40	2.50	2.50	2.35@2.65
Ind. 4th Vein screenings	Chicago	1.60	1.90	2.00	1.85@2.10
Ind. 5th Vein lump	Chicago	2.95	2.80	3.20	*2.60@3.25*
Ind. 5th Vein mine run	Chicago	2.20	2.25	2.25	2.10@2.40
Ind. 5th Vein screenings	Chicago	1.45	1.65	1.75	1.65@1.85
Standard lump	St. Louis	2.90	2.90	2.75	*2.50@2.75*
Standard mine run	St. Louis	2.00	1.90	1.95	1.85@2.00
Standard screenings	St. Louis	1.00	1.05	1.20	*1.00@1.25*
West. Ky. lump	Louisville	2.60	2.55	2.50	**2.50@2.75**
West. Ky. mine run	Louisville	1.90	1.85	1.85	1.70@2.00
West Ky. screenings	Louisville	0.95	1.25	1.40	**1.60@2.00**
South and Southwest					
Big Seam lump	Birmingham	2.90	2.90	2.90	*2.50@2.75*
Big Seam mine run	Birmingham	1.85	1.85	1.85	1.70@2.00
Big Seam (washed)	Birmingham	2.10	2.10	2.10	*1.75@2.00*
S. E. Ky. lump	Louisville	2.75	2.75	2.60	*2.50@2.65*
S. E. Ky. mine run	Louisville	1.55	1.65	1.55	1.50@1.65
S. E. Ky. screenings	Louisville	1.10	1.15	1.20	**1.25@1.40**
S. E. Ky. lump	Cincinnati	2.75	2.65	2.50	*2.25@2.50*
S. E. Ky. mine run	Cincinnati	1.45	1.65	1.50	**1.75**
S. E. Ky. screenings	Cincinnati	0.95	1.05	1.10	**1.00@1.25**
Kansas lump	Kansas City	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads

†Advances over previous week shown in heavy type, declines in italics

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Feb. 13, 1922 Independent	Feb. 13, 1922 Company	Feb. 20, 1922 Independent	Feb. 20, 1922 Company	Feb. 27, 1922† Independent	Feb. 27, 1922† Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.00@$7.50	7.75@7.85	$7.00@7.50	7.75@7.85	$7.00@$7.50	7.75@7.85
Egg	New York	2.61	7.50@7.75	7.60@7.75	7.25@7.75	7.60@7.75	7.25@7.75	7.60@7.75
Egg	Philadelphia	2.66	7.15@7.75	7.75	7.15@7.75	7.75	7.15@7.75	7.75
Egg	Chicago	5.63	7.50*	7.40*	7.50*	7.40*	7.50*	7.40*
Stove	New York	2.61	7.85@8.10	7.90@8.10	7.75@8.10	7.90@8.10	7.75@8.10	7.90@8.10
Stove	Philadelphia	2.66	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Stove	Chicago	5.63	7.75*	7.60*	7.75*	7.60*	7.75*	7.60*
Chestnut	New York	2.61	7.85@8.10	7.90@8.10	7.85@8.10	7.90@8.10	7.85@8.10	7.90@8.10
Chestnut	Philadelphia	2.66	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25
Chestnut	Chicago	5.63	7.75*	7.60*	7.75*	7.60*	7.75*	7.60*
Pea	New York	2.47	5.00@5.50	5.75@6.50	5.00@5.50	5.75@6.50	5.00@5.25	*5.75@6.35*
Pea	Philadelphia	2.38	4.75@5.00	6.15@6.25	4.75@5.00	6.15@6.25	4.75@5.00	6.15@6.25
Pea	Chicago	5.63	6.10*	6.10*	6.10*	6.10*	6.10*	6.10*
Buckwheat No. 1	New York	2.47	3.00@3.60	3.50	3.00@3.50	3.50	3.00@3.50	3.50
Buckwheat No. 1	Philadelphia	2.38	2.75@3.25	3.50	2.75@3.50	3.50	2.75@3.50	3.50
Rice	New York	2.47	2.00@2.50	2.50	2.00@2.50	2.50	2.00@2.50	2.50
Rice	Philadelphia	2.38	1.75@2.25	2.50	2.00@2.25	2.50	**2.00@2.50**	2.50
Barley	New York	2.47	1.50@1.75	1.50	1.50@1.75	1.50	1.50@1.75	1.50
Barley	Philadelphia	2.38	1.00@1.75	1.50	1.25@1.75	1.50	**1.50@1.75**	1.50
Birdseye	New York	2.47	....	2.00@2.50	....	2.00@2.50	1.60@1.90	2.00@2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type, declines in italics.

are a little more active in that territory, as private wage agreements at some mines have permitted a more nearly competitive basis with the Southern coals. Detailed record of New England receipts during 1921 and recent years are shown in the following tables:

RECEIPTS OF COAL IN NEW ENGLAND BY TIDE AND RAIL IN 1921
(In Thousands of Net Tons)

Month	Anthracite Tide	Anthracite Rail	Anthracite Total	Bituminous Tide	Bituminous Rail	Bituminous Total
January	316	643	959	707	981	1,688
February	350	764	1,114	544	721	1,265
March	304	899	1,203	594	741	1,335
April	306	599	905	604	586	1,190
May	374	667	1,041	588	650	1,238
June	387	685	1,072	759	799	1,558
July	309	652	961	612	634	1,246
August	254	534	788	810	690	1,500
September	243	445	688	824	644	1,468
October	324	595	919	1,003	644	1,647
November	255	615	870	869	712	1,581
December	273	581	854	900	572	1,472
Total	3,695	7,679	11,374	8,814	8,374	17,188

RECEIPTS OF COAL IN NEW ENGLAND, 1916—1921
(In Net Tons)

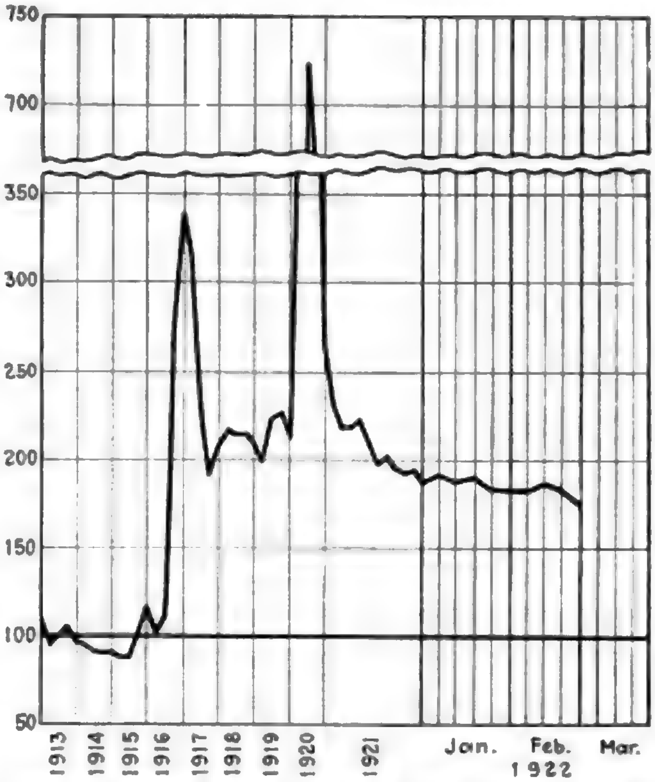
Year	Tide	Rail	Tide and Rail
		Anthracite	
1916	5,228,000	5,487,000	10,715,000
1917	4,421,000	7,259,000	11,680,000
1918	4,117,000	9,504,000	13,621,000
1919	3,310,000	7,268,000	10,578,000
1920	3,521,000	7,734,000	11,255,000
1921	3,695,000	7,679,000	11,374,000
		Bituminous	
1916	14,193,000	9,929,000	24,122,000
1917	12,693,000	10,811,000	23,504,000
1918	16,057,000	11,114,000	27,171,000
1919	8,527,000	9,655,000	18,182,000
1920	10,211,000	12,223,000	22,434,000
1921	8,814,000	8,374,000	17,188,000

COKE

Beehive coke production continues to increase. During the third week of February 135,000 net tons were produced, as compared with 128,000 tons in the previous week. Orders are coming in more freely and prices are firm at the higher range quoted late in February. In the Connellsville region the better demand for coal is affecting forward quotations on coke.

ANTHRACITE

Based on carriers' reports, production during the week ended Feb. 18 was 1,703,000 net tons, 119,000 tons less than during the previous week. Retail stocks are still good and, while more householders have been ordering, the business done is in small lots. The retailer is in no great hurry to replenish domestic supplies and a softening independent market is the result. The New England section, however, is more active and some shippers are behind on their orders. All-rail New England movement was 2,812 cars during the week ended Feb. 18, as compared with 2,967 cars in the preceding week.



Coal Age Index, 180, Week of Feb. 27, 1922. Average spot price for same period, $2.18. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

New South Wales—Exports of coal from Newcastle during January were 362,000 tons.

Italy. — The price for Cardiff best steam is now 39s., according to a cable to *Coal Age*. Last week's quotations was 38s. 9d.

Germany. — German coal prices are due for another increase, probably by 200 marks a ton, effective March 1, thereby reaching the level of world market prices.

Spain.—The following are the latest quotations for Asturian coal, free on truck: Screened, best, 60 pesetas, screened, ordinary, 58, large, best, 60 and large, ordinary, 58.

Belgium. — The fall in the price of coal tends to spread, the reduction on certain descriptions amounting to 6 fr. It is thought that the reduction should reach at least 10 fr. as transactions with English firms have been carried out at prices varying from 7 to 10 fr. below the Belgian prices after the fall mentioned. The coke market is still active.

Hampton Roads Pier Situation

	Week Ended Feb. 16	Week Ended Feb. 23
N. & W. Piers, Lamberts Point:		
Cars on hand	2,400	1,889
Tons on hand	140,000	109,620
Tons dumped	137,394	101,143
Tonnage waiting	7,000	.....
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,517	1,859
Tons on hand	75,850	93,450
Tons dumped	75,090	56,206
Tonnage waiting	7,660	37,654
C. & O. Piers, Newport News:		
Cars on hand	1,499	1,656
Tons on hand	74,950	87,750
Tons dumped	51,735	52,108
Tonnage waiting	.....	9,800

Production and Stocks of Coal in France, December, 1921

(IN METRIC TONS)

District	Total Mined Coal	Total Mined Lignite	Stocks at Mines, Dec. 31, 1921 Coal	Stocks Lignite	Stocks Coke	Stocks Briquets
Arras	....	....	....	....	....	....
Douai	574,815	....	412,620	....	361	1,314
Saint-Etienne	318,345	....	134,095	....	8,694	2,642
Lyon	213,050	286	107,674	....	....	5,947
Clermont-Ferrand	119,707	....	63,567	....	....	....
Alais	167,868	2,220	91,993	547	12	3,842
Toulouse	151,477	168	83,340	420	2,804	9,284
Marseille	2,443	68,630	2,373	11,441	....	....
Nantes	4,891	....	16,691	....	....	28
Bordeaux	6,531	857	16,457	87	....	2,008
Nancy	9,432	69	16,325	....	1,242	....
Strasbourg	359,285	....	42,293	....	2,794	....
Total	1,927,844	72,230	987,428	12,495	15,907	25,065
Sarre	928,498	....	689,652	....	782	....
Grand total	2,856,342	72,230	1,677,080	12,495	16,689	25,065

British Output Increases Nearly 100,000 Tons; Export Demand Causes Price Advance

PRODUCTION in Great Britain continues to increase. The output during the week ended Feb. 11 was 4,900,000 gross tons, according to a cable to *Coal Age*, as compared with 4,803,000 tons in the preceding week. Advancing prices have followed an increased export demand. The Italian market is feeling the German railway trouble and this has resulted in heavier buying of Welsh grades.

Greater activity is being shown in coking coals and coke now than at any time since the beginning of last year. Inquiries in these classes are becoming numerous, especially in the north of England. Scotland also reports greater activity in almost all branches of the industry.

The miners have conferred with the owners on the question of wages, when it transpired that seven of the districts under the Miners' Federation are on the minimum wage, and that in every district there has been a fall in wages.

After a meeting of the National Board the following statement was issued: The Board reviewed the position in which the industry is now placed. It was found that the wages of the workmen are unprecedently low in many districts. In seven out of the thirteen areas scheduled in the agreement wages have been brought down to the minimum, and in spite of this fact serious losses are being incurred. It was decided that a special joint committee be appointed to consider the effect of German reparation coal on the British trade, and to report to a full meeting of the Board, at which meeting the whole position of the trade will be further considered.

The Scottish railway companies have now fallen into line with their English companies and have announced reductions in the rates for carrying coal, coke and patent fuel for blast furnaces and steel works. The 100 per cent increase on the rates of January, 1920, has been reduced by 25 per cent, and the flat rate of 6d. per ton has been reduced by 2d.

Hampton Roads Market Is Firmer

With the exception of holiday idleness, business moved as usual during the latter part of February, with possibly more activity. The market was firmer in all quarters, and prices were stronger.

Coastwise movement held its own. The bunker trade continued to increase slightly, in line with the steady growth of general shipping.

Much interest was aroused by a visit of a delegation of Brazilian officials and business men, who forecasted for Hampton Roads a larger trade with their country. The development of Virginia's own mineral resources, for shipment through Virginia's port, is a part of a trade revival program now being conducted, and which was given impetus by the visit of these officials.

British Coal Exports in 1921

DESTINATIONS OF EXPORTS DURING 1921

Country	Seven Months Ended July 30 Tons	Five Months Ended Dec. 31 Tons	Total, 1921 Tons
France	1,687,417	4,708,234	6,395,651
Italy	1,136,251	2,246,832	3,383,083
Denmark	536,216	1,267,345	1,803,561
Netherlands	426,721	1,360,957	1,787,678
Sweden	228,847	1,004,057	1,232,904
Spain	428,108	593,370	1,021,472
Orgentine	253,108	634,236	887,344
Arazil	25,189	217,034	242,223
Bigeria	174,107	281,257	455,362
Ather countries	1,945,804	5,505,462	7,451,272
Total	6,841,768	17,818,784	24,660,552

MONTHLY EXPORTS, 1913, 1920 AND 1921.

Month	1913 Tons	1920 Tons	1921 Tons
Jan.	6,070,318	3,358,572	1,700,106
Feb.	5,569,917	2,601,046	1,729,148
March	5,598,774	2,406,151	1,968,078
April	6,350,869	1,995,895	606,548
May	5,929,947	2,139,261	14,066
June	6,006,410	1,930,608	7,502
July	6,975,211	2,096,996	816,320
Aug.	5,819,162	1,847,403	3,103,207
Sept.	6,197,180	1,475,623	3,406,579
Oct.	6,739,473	1,417,498	3,405,972
Nov.	5,913,404	1,360,724	3,593,864
Dec.	6,229,453	2,302,076	4,309,162
Total	73,400,118	24,931,833	24,660,552

BRITISH EXPORT PRICES, TOTAL COAL, 1921

Month	F.o.b. price s.	d.	Month	F.o.b. price s.	d.
January	65	4	August	36	6
February	49	0	September	30	6
March	43	6	October	28	5
April	43	2	November	27	1
July	38	2	December	24	10

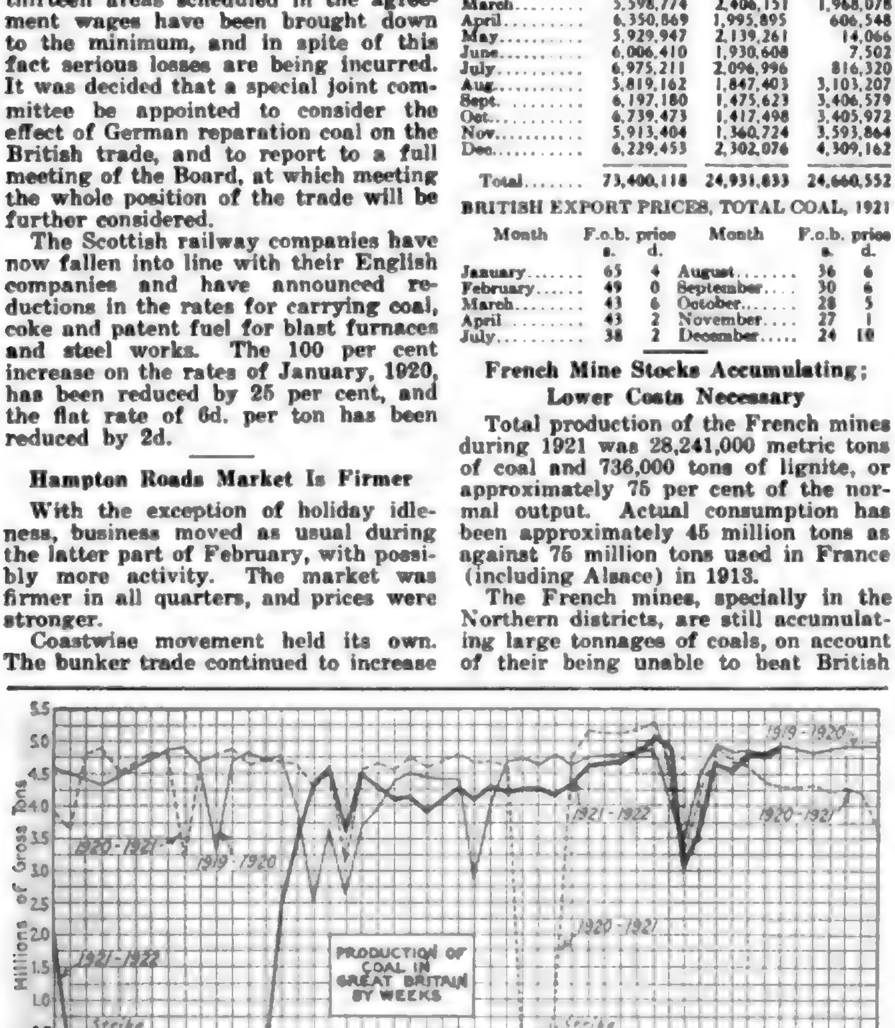
French Mine Stocks Accumulating; Lower Costs Necessary

Total production of the French mines during 1921 was 28,241,000 metric tons of coal and 736,000 tons of lignite, or approximately 75 per cent of the normal output. Actual consumption has been approximately 45 million tons as against 75 million tons used in France (including Alsace) in 1913.

The French mines, specially in the Northern districts, are still accumulating large tonnages of coals, on account of their being unable to beat British coals, which more and more invade their markets. The recent reductions in wages accepted by the miners are considered absolutely insufficient to enable any serious reduction in price. In fact, same were only 3.50 francs per ton, and previous to this reduction wages were 270 per cent higher than the pre-war standards. In England the average reduction in wages enforced was as high as 50 per cent.

As against steady reductions of prices here, from Germany comes the news of a further increase of 30 marks per ton, this on top of the 50 marks increase already enforced at the beginning of February. Of course, on account of the rate of exchange, this only means a few francs, and still leaves the price of German coals at figures much below any other.

After a few days really cold weather, which stimulated business to a small extent in domestic compartments, mild weather has again set in and there is hardly any chance of seeing the collieries' position improve on this account.



Pier and Bunker Prices, Gross Tons

PIERS

	Feb. 18	Feb. 25†
Pool 9, New York	$5.45@$5.90	*$5.45@$5.75*
Pool 10, New York	5.25@5.50	*5.25@5.40*
Pool 9, Philadelphia	5.60@5.95	*5.60@5.90*
Pool 10, Philadelphia	5.35@5.60	*5.25@5.60*
Pool 71, Philadelphia	5.70@6.05	*5.70@6.00*
Pool 1, Hamp. Rds.	4.65	4.65
Pools 5-6-7 Hamp. Rds	4.35	*4.25*
Pool 2, Hamp. Rds.	4.50	4.50

BUNKERS

	Feb. 18	Feb. 25†
Pool 9, New York	5.80@6.20	*5.70@6.05*
Pool 10, New York	5.60@5.85	*5.55@5.75*
Pool 9, Philadelphia	5.95@6.20	*5.90@6.15*
Pool 10, Philadelphia	5.75@5.90	*5.70@5.85*
Pool 1, Hamp. Rds.	4.80	4.80
Pool 2, Hamp. Rds.	4.60	4.60
Welsh, Gibraltar	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	39s. t.i.b.	39s. t.i.b.
Welsh, Messina	36s. 6d. t.i.b.	36s. 6d. t.i.b.
Welsh, Algiers	34s. f.o.b.	34s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	40s. f.a.s.	40s. f.a.s.
Welsh, Teneriffe	40s. f.a.s.	40s. f.a.s.
Welsh, Malta	40s. f.o.b.	40s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Welsh, Naples	39s. f.o.b.	39s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Belgian, Antwerp	30s.	30s.
Alexandria	43s.	**47s.**
Bombay	38 rupees	38 rupees
Capetown	42s.	42s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	Feb. 18	Feb. 25†
Admiralty, Large	25s. 3d.	**27s.@27s. 6d.**
Steam, Smalls	18s. 6d.	**19s. 6d. @ 20s.**
Newcastle:		
Best Steams	24s. 9d.	**25s.**
Best Gas	23s.	**23s. @ 24s.**
Best Bunkers	23s.	22s. 6d.@23s.

† Advances over previous week, shown in heavy type; declines in italics.

Export Clearances, Week Ended Feb. 23, 1922

FROM HAMPTON ROADS

	Tons
For Africa	
Br. S.S. Hartfield, for Dakar	6,492
For Atlantic Islands:	
Am. S.S. Cananova, for Kingston	1,490
Nor. S.S. Runa, for Teneriffe	891
For Cuba:	
Dan. S.S. Olaf L. Konstad, for Havana	8,150
Am. S.S. Glyndon, for Santiago	2,099
For Italy:	
Ital. S.S. Brenta, for Porto Ferrajo	7,414

FROM PHILADELPHIA:

For Brazil:	
Nor. S.S. Valdemar Skogland, for Rio de Janeiro	....
For Cuba:	
Nor. S.S. Certo, for Antilla	....

Cincinnati Gateway

Flood of Inquiries Appears; Some Gain in Orders Also

Much "Shopping" Being Done—Output Runs Ahead of the Demand—Higher Gas Rate Helps Cincinnati Retailers.

MORE requests for prices are being received and while orders have increased they have not kept pace with the flood of inquiries now appearing. The inference is being drawn that while there is an urge to prepare for the situation that may have to be faced on April 1, there is still time to shop around. The probable sufficiency of non-union tonnage makes a runaway market seem unlikely.

Domestic demand fluctuates with the weather, but the aggregate amount moved is heavier. Retail business at Cincinnati has been stimulated by the leap in gas rates. Increased low-volatile production softened prices a trifle last week. Storage piles are being enlarged but there also is some improvement to be noted in steam requirements. That the output has again exceeded the demand is indicated by an increasing number of "no-bills."

CINCINNATI

While the flow of business is just a little bit above what might have been considered normal for the past six months, a flood of inquiries for prices has been the chief feature of the market this week. This, however, has not been resultant of many buying orders being placed.

Kentucky operators and local sales agents are again pressing the price on nut and slack upward, most of the firms asking $1.25 for screenings but willing to take a dime less under pressure. The upward climb too, has resulted in smaller sales at the upper figure. West Virginia still holds at $1.25@$1.35 and this is so near to the mine run price that there can be but little further advance. Lump and domestic bituminous is neglected and as a result the better splints have fallen to a parity with the better grades of gas, while low-grades of the latter are down another dime.

Low-volatile offerings of lump and egg for March delivery are still unnamed as to price. Most firms are still working on orders booked two or three weeks ago.

Retail business has been strengthened by the gas situation. Bills under the new rate leaped tremendously and families that could burn coal for fuel have been ordering heavily of the smokeless lump. Prices: Smokeless lump, $8, run of mine, $6.50@$6.75; slack, $5; bituminous lump, $6.75@$7.25; run of mine, $5.75 and slack, $4.50@$4.75.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

Due to a weaker demand, prices on New River prepared coals declined slightly last week, although production was not materially affected. Coal moving unsold to Western markets had a tendency to soften quotations, which was offset by a better position at Tidewater.

Gulf mines are more active with the major portion of the tonnage destined for Tidewater and Inland East points. Some additional orders are being placed because of the strike situation but this class of business is not on a large scale.

POCAHONTAS AND TUG RIVER

Demand for Pocahontas coal was brisk enough to permit an output of about 300,000 tons during the week ended Feb. 18. Some unfilled tonnage was accumulating in the West which had a softening tendency on prices. However, New England and Tidewater markets were improved. Much of the coal is moving on short-time contracts.

Tug River production is climbing steadily upward. More coal is being utilized in the steel industry, some of the large steel concerns being regularly supplied from this field. The strike fear has also stimulated the demand and production would have been even larger had producers been able to overcome a shortage of cars which entailed a loss of about 6 per cent of potential capacity.

SOUTHEASTERN KENTUCKY

There has been a slight increase in production. The greatest activity is in nut and slack, the price of which has advanced 25c. in some cases. Block, on the other hand, has decreased in price and the one about offsets the other. Based on mine run, there is little difference in the average price.

Block continues to be strictly a weather proposition. Dealers are ordering in small lots and only when stocks are low. Due to the heavy demand for fine coals and the growing scarcity it is believed that mine run will be in better demand in the near future. As yet there seems to be little stocking coal moving.

HIGH-VOLATILE FIELDS

KANAWHA

The market as a whole shows some improvement, with the output around 25 per cent of potential capacity. Buying for storage purposes has been sufficient to enable some resumption of operations.

More strength was shown by mine run than any of the other grades. Warmer weather cut the domestic demand and this has slightly increased the call for fine coals.

LOGAN AND THACKER

In the Logan field much of the current production is going to storage. The output ranges from 45,000 to 55,000 tons daily. However, buying is not on so large a scale as was expected. Much of the coal is moving on short-time contracts.

Thacker production is on a larger scale, estimated at more than 50 per cent of capacity. The bulk of the output is moving to Western markets. There is a better demand for mine run than for other grades.

NORTHEASTERN KENTUCKY

Although prepared demand is decidedly uncertain there is a better call for steam coal, having its origin in the danger of a strike next month. Producers are keeping their coal on the open market, not feeling it necessary to enter into contracts until it is known what the strike situation will be. Inquiries are decidedly more numerous but many of them are "feelers."

West

DENVER

Five hundred miners in the Frederick lignite field are preparing to walk out unless operators restore the 30 per cent wage cut which they announced several days ago. The new wage is similar to that put into effect some months ago in the bituminous field by the Colorado Fuel & Iron Co. Some of the mines in nearby lignite districts have effected an agreement at the reduced wage.

Colorado's output is nearer normal than it has been for many months, due to cold spells. The slack market is still weak, but not as hopeless as it was several weeks ago, when a good deal of lignite steam was unloaded at $2, virtually what it cost to bring it to Denver. The list price is $3.20, having been reduced from $4.50.

Bituminous slack is bringing $2.50 at the mine in Trinidad and is retailing for $6.60, while Walsenburg or Routt steam, with a $2 mine price, is bringing $5.45.

KANSAS CITY

The most encouraging thing we have had in a long time is the strengthened price of grain, also a more encouraging outlet for the live stock industry. Added to this, all of the wheat-growing territory had good rains last week.

It looks like the United Mine Workers would make some concession and a prolonged strike is not looked for.

Buying is a little better than normal, basing same on the past twelve months. A great deal of coal has already been put in storage and even if there is no miners' strike, there will be a light demand for some time until this storage coal is used. Prices remain the same as last week and are quoted in the Weekly Review.

SALT LAKE CITY

Retail business continues to hold up despite the fact that the weather has moderated. Operators are doing as well as might be expected in view of the closing of the Pacific Coast market to Utah coal. The strike at the mine of the Cameron Coal Co. has collapsed.

Prices remain firm and there is not likely to be a change before April, when a general lowering of mine wages is expected.

Anthracite

Business Lags; Cut in Mine And Freight Costs Awaited

Domestic Outlook Is Poor, as Householders and Retailers Keep Orders to Minimum—Independent Prices Soften—Steam Coals in Good Demand, with Prices Firm.

PRODUCTION of anthracite is dropping off. Domestic trading is again quiet after a brief spurt caused by the cold spell. Small orders are the outlook for the balance of the season, as the householder plans to eke out the season on the barest requirements, while retailers generally express a desire to have low stocks on hand April 1.

Independent prices have softened with the continuance of this program. Steam coals, on the other hand, continue in good call and quotations remain firm. Much interest centers on developments in the strike situation but expectations of lowered mine and transportation costs to come are factors making for slow current business.

NEW YORK

Demand for the domestic coals is not so strong. Retail dealers are receiving many requests for immediate deliveries, indicating that consumers are buying only sufficient coal to keep their furnaces going. Dealers on the other hand are not taking any chances but are keeping their bins and in some instances the vacant spaces in their yards filled.

Some wholesale offices have sufficient business booked to carry them into the middle of March. Line trade is active, pea size excepted. Considerable interest is being taken in the new sized coals which will shortly be offered.

When it becomes apparent that the mine workers will suspend work on April 1 it is expected there will be a rush of orders. There are many, however, who appear willing to take chances with the prospects of lower freight rates and a reduction in mine wages to result in a lower price for coal.

Of the steam coals barley remains the shortest with the better grades being held at a premium of 20@25c. Buckwheat is easier. Some independent birdseye coal was offered here at prices less than $2.

PHILADELPHIA

Even though the rigors of winter have departed, the retailers have done a fair business of late. The principal cause of fair ordering is that so many consumers burned their entire stocks during the severe weather just passed. Buying is not heavy and all business seems to be rush orders.

Stocks of all sizes in the yards have been noticeably reduced, and the inroads upon pea coal has been especially marked. Some of the companies are putting a little pea into storage.

Nut is the size in greatest demand, and most yards are fairly well supplied. The new "range" size is being given a fair testing by some of the larger and more progressive retailers, one of whom has adopted an advertising campaign of education, pricing the coal at $12.75.

Steam coals continue in active demand, and some companies have picked up the major portion of barley they have had in storage. There is still a fair stock of buckwheat on hand, but it is moving fast.

BALTIMORE

The present winter has been so mild and householders have practiced such economies that the seasonal consumption has been far below normal. It was this fact that has left some of the coal dealers with considerable stocks on hand, despite the light deliveries from mines. While some of the dealers here are fairly well cleaned up on their stocks there are others who have more on hand than will prove comfortable should the threatened strike fail to mature.

BOSTON

While spot demand is more moderate than a fortnight ago, due then to the extreme cold that continued for several days, there is a reasonably steady call for domestic sizes, especially chestnut. We look to see a wholesale request all the month from retail dealers who have about decided it would be only common prudence to have coal on hand April 1 to carry them to May 15, and possibly to the end of May.

The long-expected freight rate reduction, it is realized, will hardly materialize this spring, and that makes it easier for the small distributor to make plans. There has been enough newspaper discussion already to cause mild apprehension on the part of householders, but more than a few in the trade feel there will be less scare buying when the suspension comes than has been the case in other years.

BUFFALO

A spurt of activity occurred during the latter part of last week, owing to the dip in temperature. Dealers received more orders than for many weeks past, and they were inclined to place orders to replete their stocks, but now the reaction has come and trade is flat.

Small buying on the consumers' part will undoubtedly be the rule during the remainder of the winter and dealers are planning to keep only a few weeks' tonnage on hand. The natural gas supply has been good this winter, and this has meant a loss of a great deal of coal business.

Nothing has been done toward loading cargo coal here for the opening of navigation, and the start is expected to be late. There is no urgent need of getting coal forwarded early, and not much interest is being taken by Lake purchasers.

Coke

CONNELLSVILLE

The coke market has failed to stiffen further after last week's advance, which was caused by the sudden development of a demand for prompt furnace coke, now apparently satisfied. There had been no demand for spot or prompt furnace coke for several weeks, except the small demand from miscellaneous consumers, when two or three furnaces suddenly came into the market, causing a sharp recovery in prices.

This buying seems to be over, except perhaps in the case of one furnace, while there has been a material increase in production. This may bring about a weaker market again. However, three or four furnaces contemplate getting into blast again and if they buy coke the purchases will easily support the situation.

The predicted condition, of coal being worth much more as such than when converted into coke, has not arrived, for it requires good coal or good salesmanship to bring a price above $1.50, making $2.25 for the coal required for a ton of coke which with 75c. for coking would make $3, while the furnace coke market last week rose to a range of $3.25@$3.50.

The *Courier* reports production in the week ended Feb. 18 at 63,440 tons by the furnace ovens and 59,150 tons by the merchant ovens, making a total of 102,590 tons, an increase of 11,070 tons.

UNIONTOWN

While conditions, as a whole, have not yet reached the point accepted as "good business" the activity around selling offices has shown such a turn, that when compared with the dullness of the past year, it assumes a very optimistic aspect.

Consumers have finally commenced to look to their coal requirements and are placing orders for immediate delivery. At first there was a tendency on the part of consumers to have deliveries started in the middle of March but with the alliance of the mine workers and transportation employees came the possibility that difficulty would be experienced in getting deliveries during the strike period and consumers seem now to want to have coal stocked at their plants to be prepared for any emergency that may arise.

Quotations on grades of coal have taken a slight advance. Pittsburgh steam coal is quoted $1.50@$1.60, Sewickley steam, $1.35@$1.45, with by-product at a range of $1.75@$2.

The coke market continues stronger with quotations seeking new levels almost daily as consumers search the region for tonnage.

BUFFALO

Delays are encountered in the shipment of domestic coke from the ovens, indicating that a good many orders are on hand. As much as two weeks' time is required to get shipments of some of the larger sizes. Prices are strong, at $4.25@$4.50 for Connellsville foundry, $3.25@$3.50 for 48-hr. furnace, which is scarce, and $2.75@$2.85 for stock, with some domestic sizes bringing $2.75@$2.85, to which add $3.64 for freight.

Eastern Inland

Impending Strike Fails to Boost Business as Expected

Stocking Confined Mostly to Railroads and Utilities—Industrials Ask Prices, but Postpone Purchases—Duration of Tie-up Controlling Factor.

EASTERN Inland markets have failed to measure up to the expectations of a better demand with the strike impending. More coal is moving but the stocking movement has largely been confined to railroads and public utilities. Most industrial users are interesting themselves in asking for prices and delaying their purchases until a later date. The probable length of the tie-up is the uncertain factor in the situation, and buyers are endeavoring to get a clearer indication of this time element before covering their requirements.

Prices at best are only holding firm. Non-union mines continue to obtain the cream of the business offering, as coal is still easily obtainable below the range of asking prices in the closed-shop districts.

CLEVELAND

The past few days have brought some further increase in inquiries for storage coal, but the demand is still far short of the rush predicted when the strike first seemed probable. Just how far the present buying movement will develop remains to be seen, but present indications are that it will expand to only moderate proportions.

Many consumers who, a few weeks ago, were inclined to doubt the probability of a strike are now definitely counting upon one. There is still a large number, however, who persist in the belief that the strike will be short-lived.

As a result of this uncertainty about the outcome of the struggle together with reduced industrial activity, buying still is limited. There are some features in the business outlook, however, which are encouraging. Steel mill operations in this district are improving, automobile plants are active and the rubber tire output at Akron is 100 per cent greater than one year ago.

Under the impetus of spring trade activities present tendencies in business are almost certain to grow into something akin to a moderate business revival. A coal strike to maintain war wages, and resistance of railroad employes to wage adjustments, may check the improvement and set the industrial situation back seriously.

BUFFALO

Trade shows less activity than a couple of weeks ago, and little concern is expressed over the strike situation. The majority of plants seem to be well supplied for the time being, with stocks in many cases big enough to last until May. Some factory plans for expansion have been given up for the time being, because of the feeling that raw materials are likely to be cheaper with lower freight rates.

Such spurts as occur are due largely to the weather. Little optimism is displayed over the possibility that trade will pick up within the next two or three weeks.

Some easing off in prices has been taking place lately, especially in slack, which had been in comparatively active demand. Quotations are: $2.65 for Youghiogheny gas lump, $2.40 for Pittsburgh and No. 8 steam lump, $2.15 for Allegheny Valley and other mine run and $1.40@$1.75 for slack, adding $2.36 to Allegheny Valley and $2.51 to other coals, to cover freight.

COLUMBUS

Some strength is developing in steam sizes as the result of the increasing probabilities of a strike. Steam users are taking advantage of the heavy offerings and are buying quietly to guard against the emergency, but buying is not nearly as lively as might be expected under the circumstances. Ths is attributed largely to the general belief that the non-union production will take care of the greater part of the demand and also that the strike may not last any great time.

The market for domestic sizes is quiet in most respects. Retail stocks are only fair but there is no general movement on the part of dealers to increase them under present conditions.

Production is holding up well and increasing in some sections. Reports show an output of about 32 per cent in the Hocking Valley. Pomeroy Bend, Crooksville and Cambridge districts are producing about 25 per cent. Screenings are especially strong.

With the officials of the union in Ohio refusing to meet with the operators of the Southern Ohio field in the formation of a wage scale, there is sure to be a suspension of mining.

EASTERN OHIO

Production continues firm at the higher ratio recently attained, namely, a little better than 60 per cent of potential capacity. The total mined during the week ended Feb. 18 was 374,000 tons, an increase of 2,000 tons over the preceding week.

However, the demand for storage fuel has not as yet reached anything like that which existed prior to the anticipated tie-up on the railroads last fall. As yet the only significant movement of storage fuel is to the railroads and public utilities. Manufacturers generally continue to procrastinate. It is asserted that the carriers are taking somewhere between 40 and 45 per cent of output at the present rate of production.

Association mines are working about 50 per cent of full time. Mines on the B. & O., on whose rails over half the mines in the field are situated, are reported to be working about 40 per cent of full time, those on the Pennsylvania a little better than 50 per cent, and on the W. & L. E. over 60 per cent.

The prediction is made that within the next two weeks the rank and file of industrial and manufacturing plants will become more actively concerned about their fuel bins. Spot prices have already begun to display stiffening tendencies. Slack has moved up 10c. and a wider range is noticeable with tops a little higher than those previously prevailing.

PITTSBURGH

There are no important developments in the wage scale matter. The Pittsburgh district operators have made no public moves, and are resting on their position that they are ready to meet the miners in conference, provided the check-off is eliminated from the discussion. Privately, no doubt, they are endeavoring to ascertain the attitude of the men as to individual acceptance of the scale they have posted.

Some observers are of the opinion that the men will accept, though perhaps not on the very first day after the present scale expires. The United Mine Workers are going through the formality of taking a strike vote on the operators' refusal to meet as the central competitive field. As such votes are invariably announced as having proved affirmative the operation arouses no interest.

Inquiry has perhaps increased but actual buying is only a trifle heavier and, as formerly, nearly all the orders go to the non-union districts. This demand is not sufficient to put up prices to any extent, Connellsville steam coal being $1.50@$1.60, with byproduct at $1.75@$2, and good grades of gas at about $1.90.

Pittsburgh asking prices, remain as follows: Steam slack, $1.30@$1.50; gas slack, $1.60@$1.70; steam mine run and ordinary gas, $2.10@$2.20; ¾-in., $2.60@$2.70; Panhandle 1¼-in. domestic lump, $2.75@$2.90; high grade gas mine run, $2.75@$3.

DETROIT

There is not very much interest manifested in the local market. The prospect of a strike is producing very little additional business and few buyers show any disposition to create reserves.

Buyers apparently are disinclined to take much coal until they are able to get a better line on the probable course of business through the coming months.

Smokeless lump and egg is $3.25, mine run, $2; nut and slack, $1.50. West Virginia 4-in. lump is $2.65@$2.75; 2-in. lump, $2.15@$2.25; egg, $2; mine run, $1.50; nut and slack, $1.35. Ohio 3-in. lump is $2.85; 1¼-in. lump, $2.50; egg, $2.25; mine run, $1.85; nut and slack, $1.40. Pittsburgh No. 8 1¼-in. lump is $2.85; ¾-in. lump, $2.25; mine run, $1.90@$2; nut and slack, $1.65@$1.75.

NORTHERN PANHANDLE

Increasing interest in future coal supplies has not as yet caused a rush of orders. Railroad fuel business is still the mainstay of production. With future wages uncertain no contracts are being made except for extremely short periods.

North Atlantic

Buyers Await Developments, Undisturbed at Outlook

Apparent Certainty of Strike Fails to Stimulate Markets Much—Inquiries for Quotations Principal Activity Noted—Unconsigned Coal Appears—Danger Seen in Continuance of Heavy Receipts.

DESPITE the growing certainty of a strike not much stimulus was felt in North Atlantic markets last week. Consumers are watching developments rather than looking to safeguarding their fuel supply. The feeling prevails among buyers that there will be plenty of coal available between now and April 1, and inquiries for quotations constitute their main activity.

Unconsigned tonnage is appearing, having been shipped in anticipation of a more healthy demand. This has been absorbed with but little softening of prices as yet. A continuance of the heavier receipts, however, will have a depressing tendency if the expected demand fails to materialize.

NEW YORK

Movement continues good but most of it is on contract. The line trade leads that at Tidewater. Free coals are not moving with the vim that might be expected for this time of the year. However, unless all signs and predictions of those who ought to know fail, this inactivity is not for long. Many of the trade expect a revival of business within the next couple of weeks.

Consumers at present are not buying save for immediate requirements except in isolated instances where buyers are stocking up against a possible strike on April 1. In the latter class are some consumers who already have large reserve stocks.

Although there is considerable coal reported at the local piers, quotations do not show any appreciable change, except that in some instances the range is wider. With production increasing unconsigned coals continue to be shipped here but it has not become so large as to force prices down.

BALTIMORE

While there are some spurt spots in buying from time to time and individual tightening in sales price, the situation as a whole continues most unsatisfactory. The export movement has fallen into the discard.

The move of the Government to force a conference for settlement of the wage dispute has undoubtedly strengthened the apathetic feeling in the minds of the general public.

The price situation is exceptionally weak. As a general thing, the effort of the producers to force better prices has ended in failure because of the public's refusal to buy in any considerable quantity. The market at this writing is a little better than a week ago, when gas coals of all kinds were particularly weak. While low-grade Fairmont coals are still on a very low basis there is an improvement noted as to price for some of the better grade gas productions.

UPPER POTOMAC

Production is still very low although there has been some slight improvement lately from the almost complete idleness in evidence during January. Some few mines have resumed operations on a lower wage scale. Railroad fuel is in better call and the likelihood of a strike is bringing more forward business.

PHILADELPHIA

There are fluctuating reports as to the demand for soft coal, but even though industrial conditions are inclined to remain in a laggard state, the ordering of coal has not lost any ground.

Smaller consumers are keeping ahead by a slight margin and probably buying just a least bit more actively. The real big consumers seem to have about 45- to 60-days' margin ahead, based on present consumption.

All houses are laying stress on the fact that spot quotations mean just that and cannot be held out for several weeks. Nothing is being done as to contracts. It is quite likely that shippers will endeavor to take care of their customers, so far as they can, on the basis of the spot market following April 1, as there is a growing belief that there will be a good tonnage of non-union coal to be had.

CENTRAL PENNSYLVANIA

Coal operators of this field are watching labor developments and are of the opinion that the adoption of the miners' policy to stand pat on the present wage scale will undoubtedly result in a suspension of operations in this district.

There is much interest shown in that part of the committee's report providing that the outlying districts shall be authorized to make agreements only after such agreements are made in the central competitive field.

Western Pennsylvania, West Virginia and Ohio, having withdrawn, this leaves only Indiana and Illinois in the central field.

Operators here contend that mining and shipping conditions are so different in Indiana and Illinois as compared with central Pennsylvania, that a wage scale based on conditions there would be absolutely worthless here.

FAIRMONT

There is a better tone to the market and indications are that demand for storage purposes will increase. Railroads are taking larger stocks and inquiries are more plentiful all around. With the exception of prepared coals, prices are unchanged. Open-shop mines are, of course, more active than others with higher production costs.

Chicago and Midwest

Disappointing Market Shows Promise for Future

Weather and Strike Developments Leading Influences — Large Companies Advise Not Larger Than 60-Day Reserve—Improved Agricultural Conditions Presage Better Domestic Market.

MIDDLE Western markets are gaining strength but the demand is a day-to-day proposition, influenced largely by the weather and the trend of strike developments. There is every evidence of a stronger market in the near future, but to date the demand for coal has not measured up to expectations.

The feeling prevails that the miners are not in such a belligerent mood as their radical demands would indicate. Some of the larger coal companies are advising their customers against stocking more than a 60-day reserve supply of fuel.

Agricultural products are in better shape and this encouraging feature indicates a growing market for domestic coal. Better times for the farmers always favorably affect the coal industry in the Middle West.

The market is in fairly satisfactory shape, but is subject to some little fluctuation.

Conditions in the rural communities, where practically the majority of the domestic coal goes, is getting more favorable every day. The farmers are now getting more money for their crops. This very decided change for the better is going to make itself felt this summer in the coal market, as the farmers will have the ready money to stock their winter coal supply early and in addition, will have, probably, sufficient funds to buy quality coal rather than placing their purchases only for the cheapest fuels available, as has been the case for the last twelve months.

The steam coal market as yet, has not responded rapidly to the strike threat. The natural demand for steam coals is so slight, owing to the slump in manufacturing, that it is very freely predicted there will be no runaway prices between now and April 1. A great many factories are even refusing to stock any additional coal, believing they will be able to get all they want and at very reasonable prices, from non-union mines.

The opinion at this writing is that the miners are not in the belligerent frame of mind they would have us believe they are, and that Mr. Lewis and his lieutenants would welcome any sort of a reasonable settlement. They know enough of the economic condition of the country to realize they must take some decrease in pay, and while there was a lot of big talk in the convention about six-hour days and five days a week, this talk was mostly on the part of the radicals and irresponsible elements in the organization.

WESTERN KENTUCKY

There is a good demand for pea and slack for use in automatic stokers. Inside of two weeks the price of screenings has advanced from $1 to $2 a ton, even with the mine run price, and a little higher in some cases.

Operators are endeavoring to force mine run where they cannot supply screenings, but unfortunately very few industrial concerns have crushers. A few years ago several of the western Kentucky operators had crushers, but most of them were thrown out.

Of course there are not many times when screenings are worth as much or more than mine run, but such conditions will apply whenever the lump movement is light.

Retailers have stocks in hand to carry them for some time, even if there is a strike, due to the fact that the winter continues mild. There is no stocking demand expected until mid-summer. However, mine run is moving somewhat better.

ST. LOUIS

The St. Louis householder is not taking seriously the fact that there may be a shortage of coal this spring and summer. It is a hand to mouth existence for the retailer, and the average user is buying the cheapest coal. Here and there some better fuel may be found listed, but the retailer's business is not what it should be.

Larger dealers are storing steam sizes for their steam contracts, figuring on a 60-day supply. This has caused the steam market to pick up a little. Anthracite and smokeless, as well as coke, is almost at a standstill. Carload steam business is also slow.

Country domestic business has dropped off and the situation is one that is very unsatisfactory and unexpected.

SOUTHERN ILLINOIS

There has been some extra movement of all sizes from the Carterville field the past week, but it was not in the volume that was anticipated. Many mines have suspended operations entirely.

Domestic movement has been light. Dealers are not storing as they are not sure that the public will buy heavily enough to justify any great domestic storage.

The break in domestic prices of the association operators was promptly followed by all others, and the independents who had been selling domestic at $3.25@$3.75 promptly got down to $3, with $3.35@$3.50 as the high point. Steam plants could buy coal much cheaper than these quotations, depending upon the volume.

The price situation in the Duquoin field, as well as that of Jackson County, is somewhat similar to the independent conditions in the Carterville field. Working time, however, is unusually poor. The Mt. Olive situation has shown some little improvement in the amount of railroad coal moving, although domestic tonnage seems to have weakened in price.

The Standard situation seems to be getting worse. A little storage coal is moving, but not enough to make any great impression, outside of the railroad tonnage. Mines are getting an average of three days a week—those that are working. Everything is hard to move, although screenings have picked up in the last few days.

LOUISVILLE

Field conditions are improving steadily, there being a very fair demand for steam coal, but there have been cancellations of prepared sizes, which is making it hard for operators to fill some orders taken for screenings.

Rapid advance of western Kentucky steam coal has resulted in the price now being so high that eastern Kentucky screenings on a higher freight rate can enter the local market in competition.

If a strike does not develop a very slow market is in prospect in the spring as a result of recent stocking by industries. The Lake demand is about the only thing in sight for spring if the strike does not work out.

Some of the large industrial consumers, such as brick, lime, cement and similar manufacturers do not believe that a strike will materialize, and are not planning to have more than a 30-day supply of coal on hand April 1. However, as prices now are very low, and there is not much prospect of reduction in freight rates this does not appear to be a very safe policy, especially as demand for all building supplies is picking up, and promises to be heavy through the summer.

CHICAGO

Some warm weather put a temporary stop to a market which promises to become active as April 1 draws near. The warm weather had an instantaneous effect on the market, but luckily some seasonable cold weather came along in the shape of a blizzard from the Northwest, which put the market once more in a satisfactory condition.

The steam market is getting along in fairly good shape. Some stocking is going on but not in the volume expected. Buyers of industrial coal are taking into consideration the fact that freight rates will probably be reduced some time this spring or early in the summer, and consequently, even if the strike lasts a long time, they do not want to have big storage piles paid for on the present wage scale basis, in addition to the present high freight rates. Another factor of no small influence is the high tonnage of non-union coal which is moving into Chicago and which undoubtedly will continue to move in during the strike.

Domestic coals are not as strong as they should be. The recent cut of 40c. a ton has practically no influence as yet on the market. Dealers claim that they can buy all the smokeless mine run they want, at $1.75 a ton, current price, and $2, contract price. We have even heard rumors of some contracts being closed as low at $1.75. On very cold days the local yards are flooded with orders and peddlers with wagons, whereas in contrast to this, on warm days the yards of the retail trade are in a state of complete stagnation.

The householder is not worried a bit over the prospects of a strike. Some time between now and April 1 he will probably buy a few tons to tide him over the chilly spring days, but there will be no rush for coal, nor in our opinion, will there be any great advance in prices on domestic coal from the non-union fields.

High-grade Illinois and Indiana coals for domestic purposes are moving only sluggishly. Kentucky and West Virginia coals are a little brisker, principally because the retail dealers are trying to make a connection today which will stand them in good stead in case the strike lasts longer than is anticipated. The movement of West Virginia smokeless is fairly heavy, principally on account of the attractive prices at which this coal is being offered.

INDIANAPOLIS

Uncertainty as to just what may be done between now and April 1 regarding a settlement of wage differences has begun to have some bearing on the local coal situation. The market is rather flighty. During the past week there has been a slight increase in demand for steam coal. This is due somewhat to the increase in industrial production, but for the most part to the fact that most industrial consumers are up in the air as to what may happen.

South

BIRMINGHAM

Commercial and domestic markets have undergone no improvement in the past week. Steam buying is light and confined to spot channels, there being no change in the general policy which consumers have been following for many months.

Most of the rail lines are taking an increased allotment on their contracts and are accumulating sufficient quantity above current needs to enable stocking to some extent. This principally accounts for the boost in production and movement which has been gradual through the first three weeks of February.

Specifications for the fuel requirements of the Louisville & Nashville and the Frisco lines for the year beginning April 1 are expected by local distributors and producers shortly.

Moderate weather conditions have slowed down the domestic demand. Dealers as a rule still have considerable stocks on hand and are buying little.

Mine quotations are as follows:

	Lump and Nut	Washed
Carbon Hill	$3.00	$1.17@2.00
Cahaba	$3.75@4.50	2.00@2.25
Black Creek ...	3.75@4.50	2.00@2.25
Corona	3.00	2.00@2.35

VIRGINIA

Production is up and down, with 50 per cent of capacity as the minimum. Some business is coming in as the result of preparation for a strike. C. C. & O. mines continue to lead all others in points of production. Lump is $3@$3.50, mine run $2@$2.25, with slack not far behind.

Northwest

Blizzard Helps Orders But Hampers Deliveries

Rush Orders Reveal Hand-to-Mouth Buying by Consumers—Certainty of Strike Affects Market, as Danger to Reserves Is Realized.

DELIVERIES were greatly hampered by a severe blizzard last week. The storm brought with it a number of rush orders, which were slow in being filled owing to loading and transportation difficulties. The insistence of buyers on prompt delivery indicates to what extent consumers are running on a hand-to-mouth basis. The certainty of a strike is now having some effect on the market, as the feeling is beginning to prevail that a prolonged tie-up might endanger reserves despite the good supply now on docks.

Screenings are scarce all around and rail shippers are making concessions on domestic grades to enable them to meet the fine-coal demands.

DULUTH

Blockades in shipments, because of heavy snow conditions are menacing Northwest markets. Last week many cases of delayed shipments were reported to Duluth-Superior docks.

The situation is known to be serious in North Dakota, and it is probable that the blizzard may tie up things indefinitely.

Screenings are of paramount interest in the price field. They are still gaining strength, and show a steady price climb. This writing finds Youghiogheny, Splint and Fairmont screenings at $4.50, with some docks demanding $4.75. Hocking screenings are 25c. below this mark. It is probable that further advances will take place within a few days. Prices on lump and run of pile, while firmer, remain the same.

Some public utilities are suffering for coal, it is reported, and will feel any continued rail tie-up keenly. These of course are ordering frantically and several orders from the southern part of the state from manufacturing concerns are likewise helping to brighten the bituminous market. The Iron Ranges are dead, and what little life was reported there seems to have flickered out.

MINNEAPOLIS

Since the strike in the coal mines it has become as assured as anything can be prior to consummation, the steam trade and retailers of the Northwest are awakening to the fact that they may have a share in the general experience attendant thereon. If the strike shall be prolonged, as it may, for several months, the chances are that the supply will be none too much.

What to do now before the stress of the market becomes pronounced, is puzzling buyers. They do not want to buy in advance of reasonable needs. Neither do they wish to be caught unprepared in the event of a prolonged cessation of mining. Buying storage coal in the late winter and early spring is attended with the possibility of it being carried for some time.

The commercial situation adds to the confusion. Manufacturing and commerce have been slow for a long time, and still continue so. Any early improvement is far from assured. Many do not expect any great change in the situation and to meet the uncertainties is a hard task.

For the present, there seems to be somewhat more buying. The weather has been such as to call for steady consumption for some time past. The recent severe storm has crippled deliveries. Even with the backwardness of buying, stocks have been run down and have had to be replenished in some degree. In spite of the hope of a reduction of costs, the buyers know that freights will not be cut without notice, and that mining costs will not drop with a strike pending.

Prices are getting firmer right along. The lowest figures have been advanced, and the 50c. raise made by one or two companies a short time ago has been made by some others. It is probable that there will be further advances for the efforts to dispose of coal during the winter resulted in some very low figures which are not justified on the cost laid down and the operating costs.

MILWAUKEE

Dealers were kept reasonably busy throughout February. While the volume of business was not as great as normally, the demand was sufficient to keep delivery systems busy.

Prices are held firmly. There has been some cutting on the quiet, but a growing scarcity of screenings has put an end to this practice. Illinois and Indiana screened coal is being pushed to stimulate production of screenings, and this necessity opens up a temptation to shade the prices of screened grades. Milwaukee dock men have circularized their customers to the effect that screenings are growing scarce, and that they must prepare to use higher priced coal. The steam demand from the country is picking up.

All the floating cargoes in the harbor have been docked, the last boat going under the unloading bridges last week. There were eleven cargoes in all, aggregating about 80,000 tons, equally divided between hard and soft coal.

New England

Reserves Provided for New England Market Softens

Light Consumption and Industrial Calm Presage Long Period of Dullness—Promise of Non-Union Coal in Plenty Restores Consumer's Confidence.

NEW England buyers are less interested than two weeks ago. Reserves have been largely provided for and the market has quieted down. Light consumption and few industrial bright spots indicate a long spell of slow business. The textile strike has further reduced the demand for fuel. Business done is in small lots and the average consumer feels that there is no further need to safeguard his reserve stocks, especially as the supply of non-union coal promises to be good and easily available.

Marine freights have softened from the recent advance. All-rail shippers are a trifle more active where temporary wage agreements permit producers to again approach a competitive basis with the water-borne coals.

The textile strike here is one feature of the situation that causes anxiety. In the smaller towns where the unions are not strong the mill-workers have accepted the reduced wages, leaving to the better organized hands in Manchester, N. H., and Lowell, Mass., the effort to force mill-owners to continue the former wage scale. Meanwhile, most of the plants affected have ample stocks of coal and there will be little buying from that quarter until the issue is decided.

Heavy accumulations are the rule at the Hampton Roads piers. Part of this condition is due to non-arrival of bottoms because of adverse weather, but the prime factor is of course the draggy market. Several of the agencies are paying heavily for car service while others are selling where they can at prices calculated to move the coal. It is clear that the region will have to operate under heavy curtailment for the present, although a fair demand is reported along the line and to the West.

At rehandling points like Providence, Boston, and Portland there is moderate spot demand, but prices have eased off somewhat from the $6.25@$6.50 range that prevailed during most of February.

Marine freights have already begun to decline, although not more than 10c. to Boston has as yet been conceded. Large barges that were being chartered at $1.35 a week or more ago are now offering at $1.25. There are too many steamers available on dollar freights to warrant a figure much over that.

In no direction is there more than a very quiet demand for the Pennsylvania grades. A few operators who were obliged all fall and winter to maintain what they considered a minimum price because of wage scale have now been able to reach some temporary arrangement with labor that will permit naming a more nearly competitive basis.

News Items From Field and Trade

ALABAMA

An advisory committee, which will assist in working out the program of investigations at the Southern Experiment Station at Tuscaloosa, has been selected as follows: **C. E. Abbott**, Tennessee Coal, Iron & Railroad Co.; **C. E. Bowron**, Gulf States Steel Co.; **W. M. Lacey**, Woodward Iron Co.; **W. J. Penhallegon**, Republic Iron & Steel Co.; **J. E. Strong**, The Alabama Co.; **H. J. Thomas**, Sloss-Sheffield Steel & Iron Co.

CALIFORNIA

Sealed proposals for furnishing 3,000 tons of coal, to be delivered during the balance of the fiscal year ending June 30, 1922, to Fort D. A. Russell, Wyo., will be opened by the San Francisco General Intermediate Depot, Q. M. Section, Ft. Mason, on March 6.

CONNECTICUT

Roderick C. McNeil, of the McNeil Terminal Co., wholesale and retail coal and coke dealers, Bridgeport, has recently been chosen president and treasurer of the Connecticut Sand & Gravel Co.

The William B. Bristol Coal Co., Ansonia, and Derby, recently filed papers for dissolution of the company. All claims should be sent to Herbert L. Bristol, Mechanics St., Ansonia.

ILLINOIS

The mine of the **Perrine Coal Co.**, at Ward, has been closed down and the two shafts sealed in an effort to smother a fire which gained such headway as to block all attempts of rescue teams to save the mine from disaster. Rescue teams from Duquoin and other surrounding towns worked for two days combating the flames with no results. The mine will be kept sealed and under state supervision until the flames have been smothered.

The Central Illinois Public Utilities Co., which is in control of all the public utility plants in the southern Illinois mining fields, has, it is understood, taken option on several thousand acres of land on the Mississippi River near Grand Tower for the purpose of building a dam on the order of the one at Keokuk. This plant will be supplemented by one or two boosting stations in the coal fields, such as the one now at Harrisburg, to take care of the peak loads.

The Missouri Pacific R.R. is storing approximately 50,000 tons at Gorham. It is also understood that the Cotton Belt will store a couple of months' supply at Gorham. The Illinois Central has stored 800 cars of coal along the line northward from Carbondale and it is understood that this will be increased to about 3,000 cars previous to April 1. The Mobile & Ohio R.R. is keeping the usual storage supplies up and it is understood that arrangements are being made to take care of a supply at Cairo.

Albert J. Nason, president of the **Illinois Coal & Coke Co.**, was in Mt. Vernon recently and while there made the announcement that his company was almost ready to begin operations on the sinking and construction of the new mine in Jefferson County. Plans were completed for the mine over a year ago but owing to unfavorable conditions, development was postponed until a more opportune time.

The J. H. Weil Coal Co., of Chicago, announces that **C. F. Kempf** has joined its ranks in the capacity of secretary. He was for some time with the Illinois & Indiana Coal Corporation, with mines in southern Illinois.

The holdings and property of the mine of the **Kanawha Fuel Co.**, at Duquoin, are being sold by auction. The funds will go to pay off a debt owed to former employes of the concern. Main offices are located in Milwaukee.

Alexander M. Crawford announces that he is issuing acceptances to purchase several thousand acres of coal land in the vicinity of Carpenter in the north end of Madison County, lying several miles northeast of Edwardsville. Title to the land will be taken in the name of Alexander M. Crawford, trustee, who is holding it for some Eastern investor.

The Niantic Mine at Niantic has been closed for an indefinite period.

C. J. Nelson has been appointed general agent of the Chicago, Burlington & Quincy R.R. with headquarters at Herrin. He will give particular attention to matters pertaining to coal traffic.

INDIANA

The assessment of the Diamond Coal Co., Evansville, was raised recently by the **Indiana State Tax Board** from $41,790 to $48,340. No change was made in the assessment of the Bosse Coal Co., the John Archbold Coal Co., the Crescent Coal Co., the Key Coal Co., the Possum Ridge Coal Co., the Sunnyside Coal Co., or the J. Woolley Coal Co.

The Nash Mining Co., has been organized at Muncie. The company is capitalized at $10,000. Alexander McKnight, F. A. Graham, R. H. Munshower, L. G. Lewis, A. A. Bibler, J. F. Warner, E. J. Miltenberger, J. F. Hildebrand, J. A. Jackson and G. P. Davis are interested.

As a result of 800 miners going out on an unauthorized strike recently at the **Pine Ridge Mine** at Terre Haute, the mine was idle for a few days. According to the miners' committee, the owners endeavored to impose new working conditions on the drivers. It is understood that the matter will be taken up by the board of District No. 11.

Appointment of a receiver for the **Gill Coal Co.**, of Marion, is asked by three petitioners in a suit filed in the Grant Circuit Court. The petitioners are partners in the **Consumers' Coal Co.**, of Kokomo. The petitioners alleged the Gill company is in imminent danger of insolvency and owes numerous creditors who are threatening to bring suit.

Between 350 and 400 miners escaped death in the **Big Vein Coal Co.** mine at Princeton when the shaft recently caved in. Thirty-five mules are imprisoned in the mine. The miners escaped by the air shaft. The damage is estimated at $10,000. The company has its headquarters at Terre Haute and it is said that a new shaft will be built immediately.

KENTUCKY

The Louisville & Nashville R.R. has filed suit against the **Frankel Coal Co.** for $122.20 on an account.

The Sherwin Coal & Coke Co., has been incorporated at Madisonville, capital $20,000, by E. D. Sherwin, Chicago; Brent Hart and Maurice K. Gordon, Madisonville.

In the Circuit Court, a jury has returned a verdict of $13,000 in favor of **James R. Barnett** against the **Southland Coal Co.**, for alleged removal of coal under plaintiff's property near Henderson. The case will be appealed to the Court of Appeals.

Further news has been received concerning prospects of revived traffic on the Ohio River. **The Louisville & Cincinnati Packet Co.**, has announced that contracts have been let for two boats, 285 x 82 ft., to carry 1,500 tons of freight each, and have accommodations for 300 persons each. It is planned to run them from Cincinnati to New Orleans, picking up business from Pittsburgh and upper Ohio River points with small boats and shifting freight at Cincinnati for down-river movement.

It is reported from eastern Kentucky that the **Kentucky & West Virginia Power Co.**, is planning a high-tension line from its Tug River plant to Betsey Lane, where a substation will furnish power to various mining operations, and where it plans eventually to install a power plant when consumption in the district warrants such action.

The Consolidation Coal Co., operating at Jenkins and McRoberts in Letcher County has purchased a large tract of coal and timber lands lying along the Clay-Knox border on the main line of the Cumberland & Manchester R.R. at a consideration said to exceed $500,000. Some of the properties are under development. Most of the property can be reached by the Cumberland & Manchester road, but it is expected that a short line branch or so will be necessary.

MASSACHUSETTS

The Pomeroy Coal & Wood Co., Chicopee, is having plans prepared for a reinforced concrete coal pocket and bunker at the plant in that city. It will have a capacity of five hundred tons. Geo. P. Dion, 30 Center St., Chicopee, is the engineer.

The Home City Coal Co., Springfield, was recently incorporated. The capital stock is $50,000. L. B. Phinney, Boston, is president-treasurer.

MICHIGAN

Chicago and Milwaukee interests have organized a $350,000 company, to be known as the **Peoples Coal Mining Co.**, to succeed the **Albion Mining Co.**, for working the bituminous mines in the vicinity of Albion. The Peoples company is putting in tipples, pumps, hoists and motors and is extending a high-tension line from Albion.

MISSOURI

Frank F. Tirre, until recently general manager of the North Breese Coal & Mining Co.'s mines at Breese, Ill., has accepted a position with the Coal Service Bureau of St. Louis as commissioner.

The corporate name of the **Medart Patent Pulley Co.** has been changed to **The Medart Co.** The firm manufactures power transmission machinery. Walter R. Medart is president and treasurer.

NEW YORK

J. C. Sullivan, extensively interested in mining properties in southern West Virginia, attended a meeting of smokeless operators in New York recently.

A. J. King, of Huntington, extensively interested in smokeless properties in southern West Virginia was a visitor in New York early in February.

E. C. Minter, one of the well-known operators of the Winding Gulf region of West Virginia was in New York for the meeting of the smokeless operators' association.

George J. Mechau, long connected with the Buffalo bituminous trade, has been appointed Northern sales manager of the Lake Erie Coal Co., Buffalo, with office in the Prudential Bldg.

OHIO

Efforts are being made by interested people to raise the receivership of the **Allied Power Industries**, a Columbus trust estate, which was thrown into the hands of Barton Griffith, Sr., as receiver about a month ago. A number of the interest holders were trying to raise a sum of about $75,000 but so far no announcement has been forthcoming. The concern or estate has large coal properties in Tuscarawas County both by lease and in fee simple. Other assets consists of the McDonald patent in making atomized fuel.

Upon application of **W. H. Warner & Co.**, Cleveland, **H. W. Jenkins Coal Co.**, **J. M. Taylor Coal Co.**, and the **Gibraltar Coal & Coke Co.**, all of Columbus, a receiver has been named for the **Elk Coal & Coke Co.**, Columbus. D. W. Jones is president of the company. The liabilities as listed amount to $12,983. No appraisal of the assets has been made.

In the U. S. Court at Cincinnati Judge Peck has dismissed the suit of the **Big Run Coal Co.** against the **Matthew Addy Co.** for an allowance of $16,000, said to be due as damages and a reformation of an open contract. The judge held that the Big Run company failed to come into court "with clean hands" for it was shown that two contracts were alleged to exist—one that called for deliveries at $3.50 a ton, the then Government price, and another which allowed the president of the Big Run company 7½c. a ton on the coal that was delivered to the Cincinnati concern.

John E. Luchte, Cincinnati retail man, listed $28,000 as his liabilities and $18,332 as his assets in a schedule of bankruptcy filed in the U. S. District Court at Cincinnati. Of this amounts due $16,000 is secured by mortgages. One coal firm appears among the unsecured creditors—the **H. P. Blum Coal Co.**

O. W. Gardner, **Clinton DeWitt**, and **Major Alfred Percy** of the Chesapeake & Virginia Coal Co., of Lynchburg, and G. H. Reeves, of Minneapolis, were in Cincinnati recently, attending the annual meeting of the Reeves Coal & Dock Co., of Superior, Wis.

A large coal deal was closed recently when the **Cambridge Collieries Co.** purchased the mine at Senacaville, from the **Morris Coal Co.**, together with about 8,000 acres of coal lands. The mine has been operating on part time and has a large, modern plant.

The Kensington Coal Co., Youngstown, has been chartered with a capital of $25,000 to sell coal both at wholesale and retail. Among the incorporators are T. W. Miller and F. A. Miller.

C. M. Moderwell & Co., which recently took over the Cincinnati office of the Thomas N. Mordue Co., closed March 1. E. A. Sprean, who had been in charge has moved to Indianapolis, where a branch of the Moderwell corporation is being opened

PENNSYLVANIA

Workings in the Dunmore No. 2 vein of the National Mine of the **Glen Alden Coal Co.** in South Scranton—the vein in which the fatal squeeze occurred on Jan. 12, killing four men—were explored recently by the commission of mining engineers engaged by the city to make an investigation of conditions in the mine.

Directors of the Etna Connellsville Coke Co. recently elected the following officers: President, **Joseph B. Echard**; vice-president, **D. M. Parkhill**; treasurer, **James B. Millard**; secretary, **George W. Campbell**.

The following officers and salesmen of **W. H. Bradford & Co., Inc.**, were guests of J. C. Haddock, president, **Haddock Fuel Corporation**, at Wilkes-Barre recently, spending a day visiting different Haddock operations: R. R. Reutlinger, L. G. McCrum, B. W. K. Edmons, W. P. Langford, G. N. Eck, C. M. Hetfield and W. F. Hanna.

Work in the coke region and vicinity seems to be picking up a little. **The H. C. Frick Coke Co.**, is firing some ovens at Hecla No. 1 and Colonial No. 3 plants. **The Century Coke Co.**, has fired 36 of its 205 ovens and will ship a little coal, at the plant near Brownsville, on the Monongahela. This plant has been idle for over a year. **The Vesta Coal Co.**, a subsidiary of the Jones & Laughlin Steel Co., has started to run full at the Nos. 4 and 6 mines, which have been running half time or less for several months. These are union mines on the Pennsylvania and on the Monongahela River on the edge of the non-union coke region.

At the annual meeting of the mining section of the **Engineers' Society of Western Pennsylvania**, at their rooms in the William Penn Hotel, Pittsburgh, a few days ago, the following directors were elected: W. A. Weldin, chairman; H. N. Eavenson, vice-chairman; E. H. Coxe, J. O. Durkee, R. R. Hice, J. R. Elliott and R. W. McCasland.

About 150 miners employed by the **Conemaugh Coal Mining Co.** at Park Hill, near Johnstown, who went on strike as a protest against a cut in wages, have returned to work, having come to an amicable understanding.

The Navy Smokeless Coal Co., with mines at Carrolltown Road, northern Cambria County, has secured an order for 150,000 tons of coal, delivery to start on March 1. The order was secured in Philadelphia, the purchaser not being made known. Representatives of the company, including John H. Cooney, T. Stanton Davis, Walter Jones and Superintendent W. E. Schiffer, closed negotiations while in Philadelphia recently. This, with other contracts, means two years' steady work for the mines of the company.

Coal companies incorporated recently at the State Department at Harrisburg were: **Kramer Coal Co.**, mining coal and manufacturing coke, Connellsville; capital stock, $25,000. The incorporators are K. K. Kramer, treasurer, and J. M. Gray and A. C. Herwick, all of Connellsville. **Coal Run Coal & Coke Co.**, buying and dealing in coal and the manufacture of coke; Butler capital stock, $60,000; treasurer, Edgar H. Neagley, Butler. Incorporators: Edward C. Grohman, A. Frederick Keck and Elmer W. Schenck, Butler.

The new anthracite breaker of the **Lehigh Coal & Navigation Co.**, at Coaldale, will be ready for use April 1. It cost $1,000,000. Fireproof, the building contains 2,500 tons of steel and 50,000 square feet of concrete floor. A 500-horsepower motor will operate the machinery.

Officials of the mining course at the Pennsylvania State College, have instituted a branch school at Kulpmont, Pa., in charge of a competent mining engineer. The sessions will be held in the Kulpmont school building each Monday and Friday nights.

The annual banquet of the Pottsville Y. M. C. A. was held last month. The Y. M. C. A. is particularly interesting to the anthracite coal industry as it is under the direction of this organization that the Natalie Community work is being carried on. At the banquet there were a large number of coal officials together with men interested in the anthracite industry.

In a case in which the **Hudson Coal Co.** is the defendant, the compensation board grants a hearing de novo in which Sophia Trella, of Mayfield, is the claimant. The claimant appealed from the disallowance of compensation by Referee Beemer, District No. 3, and the board holds the referee has neglected to find certain material facts. At the hearing, the time and place of which will be subsequently fixed, either party will be permitted to offer any additional testimony they may have.

A new hearing has been granted by the compensation board in the case of Mrs. John Richards, Alden, against the **Alden Coal Co.**, Wilkes-Barre. This is an appeal by the defendant from an award by Referee Lewis, District No. 9, and the board sets aside the findings of fact, the conclusions of law and the award.

In the case of Michael Efitsock, St. Clair, against the **Darkwater Coal Co.**, St. Clair, an appeal by the defendant from an award of compensation by Referee Seidel, District No. 2, the board upheld the referee and dismissed the appeal.

TEXAS

The Channel Fuel Co. has been organized at Houston, and charter filed with the secretary of state at Austin. The company will conduct a bunker coal business for ships calling at Houston. The capital stock of the company is $100,000 and the incorporators are: V. H. Bersodi, D. M. Picton and R. B. Walling, Jr.

Permit to do business in Texas has been granted the **Calvert Coal Co.** of Cumberland, Md. The company is capitalized at $25,000, and headquarters will be maintained at Rockdale, with John B. Robinson as state agent.

UTAH

Marriner Browning, chairman of the executive committee of the Lion Coal Co., Ogden, is to become general manager of the company, succeeding **D. H. Pape**, who resigned a short time ago. Mr. Browning has gone to Wyoming to visit the properties of the company. The Lion concern is one of the big companies of the mountain field.

The Peerless Coal Co., Salt Lake City, has donated five carloads of slack coal to the poor families of the city. The City may use the slack itself and with the money buy lump coal for those intended to benefit.

VIRGINIA

Charles E. Britt, of the Norfolk office of the West Virginia Coal Co., has been transferred to Newport News to take charge of the company's offices there. The Norfolk branch will be conducted as formerly, except that Mr. Britt's place will not be filled.

The Stribling Fuel Co., dealing in domestic coal, has entered a petition in bankruptcy in the Federal Court at Norfolk.

Captain H. G. Munden, general broker's agent, of Norfolk, has taken the position of Southern sales agent for the Leckie Coal Co., Inc., with offices in Norfolk.

The Willard-Sutherland Coal Co. has opened offices in Norfolk, in charge of Chester B. Koontz, well-known local coal broker.

WASHINGTON

The Crocker-Pearce Coal Co., Seattle, has been organized; capital, $100,000. Incorporators are Roy G. Crocker, W. E. Pearce and F. W. Dewart.

Settlement is near in the legal battle that has been waged for months between striking members of the United Mine Workers of America and the **Pacific Coast Coal Co.**, and smaller companies operating mines in King and Pierce counties over possession of cottages standing on the ground belonging to the companies in the various mining camps. The companies have made arrangements to purchase all cottages built on leased ground and occupied by strikers, and with the purchases completed the strikers will move out, and the eviction suits, 350 of which are pending, will be dropped.

Parties who recently visited the mine of the **Jordan Valley Coal Co.**, west of Granite Falls report that the outlook for success is very promising. A crew of men have been at work developing the company's holdings and have gone into the ground 500 ft. on one vein at which distance the coal is four feet thick and of a fine grade.

WASHINGTON, D. C.

Opposition to legislation restricting the rights of labor to strike or which seeks compulsory arbitration of labor disputes, is expressed in a petition to the House by the Tri-State District Convention of Districts 1, 7 and 9 of the United Mine Workers recently held at Shamokin, Pa., representing anthracite miners.

The provision in the Interior Department appropriation bill exempting the Government fuel yard from the law requiring inspection and weighing of fuel was eliminated on suggestion of Representative Cramton, who said the Bureau of Mines and Comptroller were not in accord on the proposition. Representative Mann, Illinois, opposed the payment by the Government of 25c. for weighing each ton of coal received by the yard and suggested the employment of a man to weigh the coal.

Representative Bankhead, of Alabama, has introduced a bill appropriating $1,000,000 to be expended by agencies designated by the President in furnishing food, clothing and shelter to suffering coal miners and their families in Kentucky, West Virginia, Alabama, Ohio and Pennsylvania.

Indian Commissioner Burke, before the House Appropriations Committee, recommended that receipts from coal and other leases on Indian lands be not wholly given to the Indians to squander, but that it should be used in reimbursing the Government for public improvements provided in behalf of the Indians. He referred to coal leases in the Five Civilized Indian tribes.

A United States Civil-Service Examination will be held on March 22-23 for mineral geographic aid and assitant mineral geographer. Applicants should apply for Form 1312, stating the title of the examination desired.

WEST VIRGINIA

James H. McGrew and M. T. Sisley of Morgantown have been appointed receivers for the **Barbara Mining Co.**, operating a tract of 185 acres of Waynesburg coal in Monongalia County.

The miners at the Abrams Creek Mine of the **Brady Coal Corporation** on the Western Maryland Ry. in Mineral County, have returned to work on the March, 1917, wage scale.

Negotiations have been completed for the sale of an acreage of Pittsburg coal, located in Marion County, adjoining the coal recently purchased by the Bethlehem Steel Co., for approximately $500,000, with a total acreage of 728 acres. The purchaser was **John M. Jamison**, of Greensburg, Pa., president of the Jamison Coal & Coke Co.

J. F. Fredlock of the Fredlock-Trowbridge Co., operating in northern West Virginia has returned from a business trip to Chicago.

The following West Virginia coal concerns have recently increased their capital stock: **Delmar Coal Co.**, from $1,000,000 to $2,000,000; **Covel Smokeless Coal Co.**, from $200,000 to $300,000; **New Export Coal Co.**, from $100,000 to $125,000; **Coal River Collieries**, from $1,000,000 to $2,000,000; **Little War Creek Coal Co.**, from $500,000 to $750,000; **Elkhorn Piney Coal Mining Co.**, from $2,500,000 to $3,000,000; **Warfield Mining Co.**, from $100,000 to $200,000.

The Logan & Kanawha Coal Co., has been chartered with a capital of $100,000 to mine coal. Incorporators are Fred Legg, S. E. Legg, W. J. Donnelly, S. A. Stewart and E. P. Mosaham.

Possession of coal acreage containing Pittsburgh coal estimated to be worth $75,000 is at stake in a suit filed in the Circuit Court of Monongalia County by **Blake I. Ramage** of Morgantown, against the **South Penn Oil Co.** The defense claims that when the property was deeded there was a clause providing for the conveyance of "all oil, gas and other mineral rights and that manifestly such a conveyance included coal." On the other hand, the plaintiff claims that there was never any intention of conveying the coal rights. The tract involved is located at the head of Doll's Run.

Progress is being made by the **Bear Mountain Gas Coal Co.**, in the construction of a large tipple not far from Fairmont. It is being constructed under the supervision of W. A. Gadd of Morgantown, general superintendent of the Hess Coal & Coke Co.

The Superior Supply Co., of Bluefield, agent-jobber for the Westinghouse Company, announces the formation of a new machinery-engineering department under the management of **C. E. Lilley**, who was formerly connected with the Westinghouse company. As sales representative in the Pocahontas field, Mr. Lilley will be succeeded by **E. P. Adair**, while Mr. Adair's territory in the Clinch Valley and Williamson fields will be handled by **J. A. Hammond**, until recently a member of the Westinghouse organization.

NOVA SCOTIA

The Nova Scotia Steel & Coal Co., Ltd., intended to store 80,000 tons of coal if the miners would agree to the Gillen Arbitration award reducing their wages. The vote of 6,054 to 224 against accepting the award removes that possibility. A conference of the United Mine Workers in this district was held Feb. 28, at Truro.

ONTARIO

A recent visitor to the Toronto office of the Penn-Canadian Fuel Co., Toronto, was **William N. Rawson**, sales manager of the Loraine Coal & Dock Co., Cleveland.

Among the coal men form across the border who interviewed the Toronto coal trade recently were **Frank H. Howard**, of the Bellebridge Coal & Coke Co., Pittsburgh, and **C. L. Couch** of the Weaver Coal Co., Buffalo.

Traffic News

Green Bay coal distributors have petitioned the Wisconsin Railroad Commission for a readjustment of freight rates. They claim that for a distance of 200 miles in the state the consumer must pay freight from Milwaukee, although the coal may be purchased at docks nearer by. Milwaukee dealers hold that the present rates are not discriminatory, and that there is a tendency to restrict their field of competition.

In the complaint of the **Nevada Public Service Commission** the I. C. C. has decided that the rates on coal from the Castle Gate district in Utah and Rock Springs, Wyo., to points in Nevada are unreasonable. It prescribes that after April 22 the rates shall be as follows: To points between Tacoma and Tule on the Southern Pacific, and between Ola and Golconda on the Western Pacific $5.50 a ton; to Winnemucca $5.90; to points between Benin and Reno on the main line of the Southern Pacific and between Krum and Reno on the Western Pacific, $6.25; to McGill and intermediate points on the Nevada Northern $5.60 on lump coal and $4.60 on slack, run of mine and nut coal and to East Ely and points beyond on the Nevada Northern rates that exceed the foregoing rates to McGill by the amounts which the present rates to those points exceed the present rates to McGill.

The I. C. C. has reopened the complaint of the **Cameron Coal Co.**, in which an examiner recommended that the rates on coal from the Helper, Utah, coal mining district to California, Idaho, Montana, Oregon, Washington, Colorado, Kansas, Nebraska, Kansas City, St. Joseph and Council Bluffs were not unreasonable, in order to bring the record down to date.

The Peerless Coal Co., of Illinois, has asked the commission to rehear its case and decide that the rates on bituminous coal from its mines in the Springfield district to various points are unreasonable because they exceed the rates from Springfield.

The commission has denied the request of the **Mississippi Valley Iron Co.**, for rehearing of its case in which the rate on coke from St. Paul to St. Louis was held to be reasonable.

The I. C. C. has suspended until June proposed increased coal rates **from Virginia mines to points in South Carolina**, and assigned the case for hearing at Spartanburg, S. C., April 3. The suspended schedules propose to increase the rates from $3.56½ to $3.88 per ton on coal from mines on the Carolina, Clinchfield & Ohio Ry., the Interstate R.R., the N. & W., and the Norton & Northern Ry., in Virginia to destinations, including Stokes to Ehrhardts, S. C., on the Atlantic Coast Line and Lemon Spur to Ehrhardts on the Bamberg, Ehrhardts & Waterboro R.R.

In the complaint of the **Tuffil Bros. Pig Iron & Coke Co.**, the commission holds that rates on smithing coal from Douglas, W. Va., to points in Iowa, Nebraska and Wisconsin, and coke from Jamison, Pa., to Iowa and Wyoming are not unreasonable.

In dismissing the complaint of the **Romann & Bush Pig Iron & Coke Co.**, the commission decides that the rates on smithing coal from mines in Pennsylvania and West Virginia, sacked at St. Louis, and forwarded to points in Western territory, are not unreasonable.

J. T. Schatt, traffic manager, has filed a complaint with the Interstate Commerce Commission on behalf of the **United Paperboard Co.**, of New York City, against the G. & J. Ry., et al (Docket No. 13472) alleging unjust and unreasonable rates on anthracite from Delaware & Hudson mines in Pennsylvania to Thomson, N. Y., and asking just and reasonable rates and reparation.

In the complaint of the **Texas Steel Co.**, an examiner recommends that rates on coke from Potter, Okla., to Rusk, Tex., during Federal control were unreasonable because they exceeded $3.20 a ton.

Deciding the complaint of the **Nye, Schneider, Fowler Co.**, the commission rules that the rates on coal from points in Colorado, Wyoming, Kansas and Arkansas, to Iowa and Nebraska are not unnreasonable.

Rates on bituminous coal from mines in the Linton group in southwestern Indiana to points in Indiana northeast of Indianapolis during Federal control were not unreasonable, according to the commission's decision in the complaint of the **Union Traction Co.**, of Indiana.

The I. C. C. has directed the Utah Railway to refund $9,511 and the Director General of Railroads to refund $150 to the **Lion Coal Co.**, on account of unreasonable charges on coal shipped from its mines to various destinations.

The Iowa Board of Railroad Commissioners has handed down a decision in the coal rate hearing, in which the intrastate rates on soft coal are reduced approximately 18 per cent. The new rates will go into effect upon proper publication. The commission makes no change in the joint rates, their former order fixing 80 per cent of the local charges on shipments going over two or more lines remaining in effect.

The Algonquin Coal Co., has been authorized to intervene in the complaint of the **Smokeless Fuel Co.**, relating to demurrage charges on coal for transshipment by vessels at Norfolk and Lambert's Point, Va.

The commission has reopened the complaint of the **Fairmont & Cleveland Coal Co.**, in which it recently found that the practice of the railroads in distributing cars to complainants mines was unreasonable. Similar complaints of the **Bell & Zoller Coal Co.**, Chicago, and the **Vigo Mining Co.**, and others will be consolidated for argument.

An I. C. C. examiner has recommended in the complaint of the **International Harvester Co.**, that rates on bituminous coal from Farmington, Norris, Brereton, Dunfermline, St. David and Bryant, Ill., to Canton, Ill., are not unreasonable.

An examiner has recommended that the **division of joint rail and water rates** on coal from the Alabama field to Mobile and New Orleans for the performance of intermediate switching at Cordova, Ala., is not unreasonable.

The commission has decided that proposed reductions in interstate rates on coal from mines in the Springfield, Ill., district served by the Chicago & Alton, and from mines in the Southwestern field located in Missouri, Kansas, Oklahoma and Arkansas, to Kansas City, Mo., and Kansas and intermediate points are not justified.

Reduction of freight rates on coal was advocated before the I. C. C. in the rate investigation by the **National Association of Retail Clothiers.**

In the case involving intrastate rates in Illinois, the **Northern Illinois Coal Operators** have filed a petition with the I. C. C. for rehearing, to remove the alleged unjust discrimination in the rates on coal and to reduce them beyond the basis prescribed by the commission in its former ruling.

In the case involving rates on coal from Illinois mines to points in Arkansas, Louisiana and Texas, the **Alabama Mining Institute** has asked the commission to decide that the coal rates under suspension be not justified as they are preferential in favor of southern Illinois mines on the Missouri Pacific. The commission is asked to consider the relationships as between Alabama and western Kentucky, and southern Illinois. The Southern Ry., has also filed a brief in the case asking that all relationships be considered.

The I. C. C. has canceled argument in the complaint of the **Old Ben Coal Corporation**, which had been assigned for Jan. 30 at Washington.

A cut in the freight rate on coal from mines on the **Cumberland & Pennsylvania R.R.** for delivery in Cumberland, Md., from the present rate of $1.26 to 84c. per ton, has been announced.

Obituary

William C. Sargent for twenty-two years secretary and a director of Chain Belt Co., Milwaukee, died recently as a result of heart failure. He was seventy-three years of age and had been in ill health for several years.

B. S. Hammill, aged 56, a widely-known Pennsylvania coal operator, banker and business man, died recently in his winter home in Vero, Fla. Lately he had been operating mines at Stotts Station, on the Montour R.R. For the last several years he had also been head of the B. S. Hammill Co., with offices in Crafton, Pa., and engaged in the wholesale buying and selling of coal.

Publications Received

Coal in Eastern Idaho, by G. R. Mansfield, U. S. Geological Survey Bulletin 716-F. 30 pp. 2 maps.

Coal in the Middle and Eastern Parts of San Juan County, New Mexico, by C. M. Bauer and J. B. Reeside, Jr., U. S. Geological Survey Bulletin 716-G. 87 pp. 9 maps, 8 photographs. Many analyses and measured sections of the coal beds.

West Virginia Geological Survey, Nicholas County. By I. C. White and David B. Roger, Pp. 847; illustrations and tables.

Coming Meetings

New England Coal Dealers' Association will hold its annual meeting March 22 and 23 at Springfield, Mass. President, W. A. Clark, Milk St., Boston, Mass.

Northwestern Pennsylvania Coal Operators' Association will hold its annual meeting Tuesday, March 7, at the Wm. Penn Hotel, Pittsburgh, Pa. Secretary, T. F. Diefenderfer, Butler, Pa.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 18-20. Secretary, S. C. McLeod, 180 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Upper Potomac Coal Association will hold its annual meeting March 6 at Cumberland, Md. Secretary, J. F. Palmer, Cumberland, Md.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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Revelations in Coke Statistics

BYPRODUCT coke is a consumers' industry from the viewpoint of the coal man. Final statistics for 1920 of the production and sale of byproduct coke, just published by the Geological Survey, show that of a total production of 30,833,951 net tons of coke in that year, producers themselves used 22,848,461 tons, or 74 per cent. Of the byproduct breeze and screening, the producers sold a third as much as they used themselves.

Sales of coke totaled 8,131,000 net tons, of which 4,000,000 tons was furnace coke. Next in importance were sales for domestic use, 2,361,737 tons, valued at $21,000,000, an average of $8.90 per ton. The remaining 1,715,000 tons was foundry coke. Michigan led in sales for domestic use, with nearly half a million tons; Indiana was second, and Illinois and New Jersey followed, each with sales for this purpose of more than 200,000 tons.

The transition from beehive to byproduct manufacture of coke means more than the mere statement implies—it means that the coke business is leaving the hands of the coal industry and going to the steel companies and public utilities.

Transportation the Controlling Factor In Coal Prices

NOT the least significant of the phenomena attending the preparations of the country for a strike of the bituminous coal miners next month has been the rise in production and decrease in prices. There are those who are more suspicious than well informed who have suggested that the operators really desire a strike, or at least the threat of one, as a stimulus to the market, which has been sagging for many months. It has been intimated by many, for instance, that the only hope for profit lies in creating a demand in excess of current requirements and that at the first opportunity the price would be shoved skyward.

It is true that the decrease in price has been insignificant in itself and has been confined to a few coals on the list, but the fact that with the increase in demand and production of the past two months the market has clung to the bottom and even sagged is indicative of the truth that it is the law of supply and demand and not the producer that sets the price. From the beginning of the year to the middle of February output gained 40 per cent while prices decreased 5 per cent.

That such could be true is due to the fact that the law of supply and demand has been unhampered either by car shortage or labor trouble. It is the best possible evidence in support of the contention of the coal industry that, given ample transportation at all times, there never will or can be inordinate coal prices. Starting at a trifle over seven million tons per week, the railroads have had no difficulty in furnishing cars and transportation for a gain of 40 per cent, or to more than ten million tons per week. But starting at ten million tons, they would be sore pressed to meet a demand on the part of the country for an increase of 10 or 15 per cent.

The mine capacity to be tapped is so great that the pre-strike spurt has as yet brought forth nothing but cheap coal. With every fresh call for a ton of coal there are two tons offered. Demand is even being anticipated and coal that has not been sold is mined and loaded into cars. This coal is cluttering up the junction points and classification yards as well as filling mine tracks. It is being freely offered to avoid demurrage. With the present organization of the bituminous coal industry the country can have cheap coal to the extent that it is willing to support a transportation system bearing the ratio to maximum demand that the one we now have bears to the coal demand of today.

Trade Association a Vital Necessity

ONLY one kind of an angel will rejoice over the news that the Peabody Coal Co. has repented of its membership in the National Coal Association, and that kind of angel is the orthodox believer in the policy of breaking up big business. There are those who hold that business possesses such great powers of injuring the rest of us that safety for the many lies in keeping it in small and relatively impotent units. The supporters of this view—and they number many thoughtful and wise men—have much on their side. The powers of resistance to government, labor or other business possessed by an enterprise so vast as the Steel Corporation are terrifying to them. They have favored the strictest construction of the Sherman and Clayton acts, and seek to multiply the regulatory functions of government exercised by the Federal Trade Commission. To such observers the rise of trade associations has appeared a menace, checked for a moment by the Hardwood decision but still formidable. Such men as these will welcome the sign of disintegration shown when one of the largest bituminous operators withdraws from trade associations, national and local—but only such.

The closer observer of the soft-coal trade, however, has come to realize that the associations are vitally needed. He knows that the consuming public has suffered less from the buccaneering of the profiteer than from the waste of competitive commercial armament. He knows that it is too much rather than too little competition which has sometimes prevented the industry from giving the integrated service the public has a right to expect. He knows that the trade association guided in legitimate channels is the most hopeful means that has yet appeared of bringing about that stabilization for which Washington yearns. For it is to the trade association that we must chiefly look for developing saner methods of mining and marketing and for educating producer and consumer to their mutual responsibilities and interests.

So vital is the need for the trade association that American business may be counted upon to attain its legitimate ends in some way acceptable to the Supreme Court of the United States. But the cause of the coal-trade association is not helped by the secession of one of the leading members. Neither, we predict, will the interests of Illinois be helped in its 30-year rivalry with the Middle Appalachian. It was not by chance that the operators' association first developed in the Middle West; it was rather because of a competitive pressure from without and within so intense as to evoke an appeal for government intervention. Remember that when freight rates come down West Virginia will move some hundreds of miles nearer Chicago again.

Anthracite Misinformation

WHAT a monstrous steal the officers of the United Mine Workers in the anthracite region have exposed! In a statement given to the press last Saturday Messrs. Kennedy, Golden and Brennan, presidents of the union districts in that region, announce that according to the statements of the operators themselves the labor cost per ton of anthracite is but $3.92, whereas the public in such cities as Philadelphia and New York are charged as much as $16 per ton. Let those who exact the difference subject themselves to deflation, say these union officers. Do not ask the miners to take less for their meager share when there is such a spread in the figures.

It is true, however, if one has the interest and patience to delve a bit further into the facts than have the authors of this inflammatory statement, that one finds things are not as Mr. Kennedy has pictured them. But we are not sure that he and his colleagues are as ignorant of the real facts as they seem, but rather that they are guilty of a clumsy attempt to becloud the issue, which is how to lower the cost of coal to the public. They note that "the only solution the operators present is to reduce the wages of the mine workers" and add:

"The operators very skillfully avoid any reference to reductions of a substantial nature in the matter of their own profits, profits of the railroads, profits of the coal sales companies, the royalty takers and distributing agents. It is, therefore, obvious that there must be some connection between the operators and all those who handle coal between the operators and the consumers, and, of course, from an interested standpoint the operators can only see deflation as far as the miners are concerned, and a continuation of the earnings of operators, railroads, sales companies and others."

Mr. Kennedy then proceeds in the following words to fix the responsibility for the cost of anthracite:

"The operators fix the labor cost of a ton of anthracite coal at $3.92, and they receive wholesale, f.o.b. mines $6.15 for pea coal, $7.85 for stove coal, $7.95 for nut coal, and $7.60 for egg coal. People in New York, Philadelphia and elsewhere in the anthracite-consuming territory pay as high as $16 per ton for coal, which is over $12 a ton more than the labor cost of $3.92. Therefore a more substantial reduction can be made in the cost of coal by a cut in the profits made above the $3.92 labor cost, quoted by the operators."

Now the figure of $3.92 represents the average labor cost for all anthracite—large and small sizes. Reference to the market pages of any issue of *Coal Age*, or inquiry from any seller of hard coal will disclose that the prices of the sizes below pea, which together make up 30 per cent of the total output, are from $1 to $3.50 per gross ton—that is, below even the labor cost of their production. These sizes are sold for such prices because in competition with other fuel they are not worth more. This is primer stuff. The producer places on the larger and more desirable sizes a price sufficient to offset the loss on the small coal.

The same authority that gives the labor cost quoted above says that other costs, including supplies and overhead, per ton of average output are $1.73, which gives a total average mine cost for anthracite of $5.75 per gross ton. After the loss on the small sizes is subtracted from the difference between this figure and the selling price at the mine for, say, nut size at around $8 per ton, there remains a margin of around 60c., from which, after federal taxes, selling expenses and interest on borrowed money are subtracted, there remains the profit of the producer. By no stretch of the imagination can this profit be figured at over 50c. per gross ton on the average; for many it is less and of course for others, more.

The census for 1919 records a total of $11,766,598 paid by all anthracite producers for royalties and rents on a production of 88,000,000 net tons, or about 15c. per gross ton. The margin allowed the sales companies has for years been 10c. per gross ton and the Fuel Administration allowed 20c. The retail dealers maintain that the dealer who can average 50c. per ton on what he handles is the exception. As for the profit to the railroads in hauling anthracite, we have no data, and we doubt if there are sufficient accountants in the country to correctly determine that figure.

We therefore arrive at the point where we can say that were all vested rights in coal lands confiscated, and leased coal taken without royalty, were all profits to the producing industry, in which according to the census of 1919 there is invested $433,868,000, eliminated, and were the distributing and selling agents and the retail dealer to forgo their profits, it would be possible at the very outside to lower the price on coal, retailing in New York and Philadelphia for $15 per net ton, by not more than $1.25, or less than 9 per cent.

Who besides Mr. Kennedy and his ilk would ask such an industry to function without profit?

It is idle in the present instance, however, to discuss these ramifications. The operators have control over production only, and they are addressing themselves to the lowering of mine costs. Wages constitute 70 per cent of the cost of production. A commission appointed by the President added 17 per cent to the wage scale in 1920, when living costs were at their peak. This was responsible for an increase of $1 in the cost of the domestic sizes of hard coal. Living costs have declined to a point below what they were when the hard-coal mine labor established the wage prevailing prior to the last increase. The point at issue is whether the union will consent to deflation in proportion, as it demanded inflation when the cost of living was ascending. We believe the public is better informed than Mr. Kennedy pretends to be.

At Clifford Mine a Flexible Storage and Reclamation Plant Counteracts Fluctuations in Demand

By a Single Conveyor Coal Is Taken to a River Tipple or to Storage or Returned from Storage to the Railroad or the River Tipple—Hoistman Starts and Stops All Motors Except in River Loading

By R. P. Lewis*
Wheeling, W. Va.

EVERY mine operator and employee well realizes that coal mining has been a more or less seasonal industry. From the standpoint of the mine employee, periodic slumps and the resultant closing down of operations mean a cessation of income and a correspondingly decreased yearly wage. The result is dissatisfaction and a feeling of unrest. If some means could be devised whereby the mines could be operated during periods of small or no demand, this evil would be largely mitigated.

The effect of a periodic or seasonal market on the operator is somewhat more complex than on the employee. During the period of no demand, for example, few or no sales are made and no income is available, yet the general overhead must be met and the mines must be kept clean and in condition to meet the demand when it shall arise. This means expenditure of money with no income to counterbalance it.

Again, consider the period of specific demand, the time, for example, when, in the bituminous fields, there is little or no market for slack. At such seasons this part of the mine product is an incumbrance. It must be disposed of somehow, even though it has to be thrown into the "gob" or on the dump. This requires labor and represents an absolute loss. Why not store the refuse of this period for salvage when this particular grade of coal shall again be in demand?

Means of Avoiding Penalty of Low Rating

Everyone in any way connected with the coal-mining industry is familiar with the effect of storage on car supply. Delays in delivering coal from the face to the railroad cars often occur owing to the breakage of equipment, to the derailment of mine cars and locomotives or to any of the hundred and one accidents that frequently occur at mines. In this event some of the railroad cars placed at the mine for loading are not loaded out on the day on which they are delivered, and a reduction in rating may be the outcome. This misfortune the operator is anxious to avoid, for if his mine be given a low rating he cannot avoid an early "shutdown." If there were a reserve of coal on which to call, the operator could always load out all the cars supplied by the railroad, and the rating would be maintained and the orders filled as scheduled.

In order to meet these difficulties the Central Coal Mining Co. at its Clifford mine, Dille, Ohio, has erected a highly complete and flexible storage and loading addition to its otherwise well-equipped plant. This addition is composed of three practically distinct parts which, nevertheless, are directly interconnected. They comprise the preparing, the storing and reclaiming, and the river loading units.

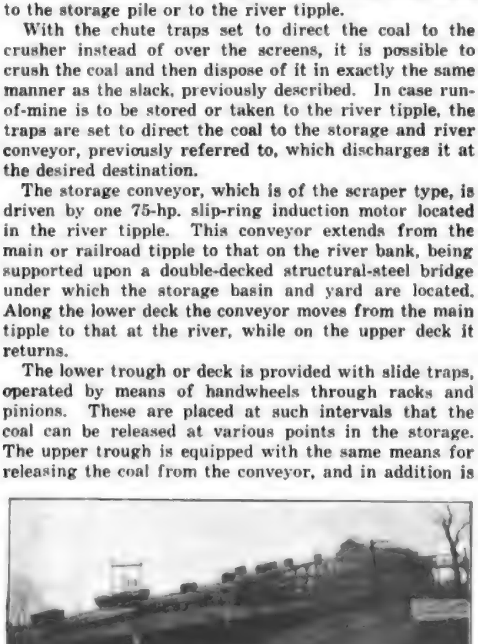
In the operation of this plant the coal is brought out of the mine by means of a continuous rope haulage. Upon reaching the tipple the coal is dumped into the weigh hopper, weighed and then released upon an elevating conveyor. This conveyor lifts the material to a point from which, by the proper arrangement of traps or doors in the chutes, it can be directed to the screens, the crusher, the storage plant, or to the river tipple for loading upon barges.

Suppose the traps are set to direct the coal over the screens. It is in that case screened and carried by the picking table, with or without the slack removed, to the car-loading boom. In case the slack is removed, this size can be taken to the slack-loading track or to a storage pocket, from which it can be reclaimed by gravity. As an alternate disposal the slack can be directed to the storage and river conveyor and taken to the storage pile or to the river tipple.

With the chute traps set to direct the coal to the crusher instead of over the screens, it is possible to crush the coal and then dispose of it in exactly the same manner as the slack, previously described. In case run-of-mine is to be stored or taken to the river tipple, the traps are set to direct the coal to the storage and river conveyor, previously referred to, which discharges it at the desired destination.

The storage conveyor, which is of the scraper type, is driven by one 75-hp. slip-ring induction motor located in the river tipple. This conveyor extends from the main or railroad tipple to that on the river bank, being supported upon a double-decked structural-steel bridge under which the storage basin and yard are located. Along the lower deck the conveyor moves from the main tipple to that at the river, while on the upper deck it returns.

The lower trough or deck is provided with slide traps, operated by means of handwheels through racks and pinions. These are placed at such intervals that the coal can be released at various points in the storage. The upper trough is equipped with the same means for releasing the coal from the conveyor, and in addition is



SLOPE HAULAGE TO CLIFFORD TIPPLE, DILLE, OHIO

The cars are brought out of the mine by a continuous rope haul and raised by the same means to the tipple. Here the coal is dumped into a weigh hopper and then released upon an elevating conveyor.

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*Manager, Electra Engineering & Construction Co.

STRUCTURAL-STEEL BRIDGE OVER STORAGE YARD

The conveyor shown on the bridge is the backbone of the whole system. Along the lower deck the conveyor moves coal from the main to the river tipple while on the upper deck the coal can be returned from storage, if that is desired.

fitted with chutes that spout the material clear of the lower deck.

By closing all the openings in the lower trough the coal is not released until it reaches the river tipple. Here are located gravity screens which allow of the usual separation of sizes. Should it be desired to remove the slack, this may be accomplished by an adjustment of the proper trap. This grade of fuel is then allowed to fall into a bin, from which it can be reclaimed through the medium of a bucket conveyor driven by sprocket and chain from the main storage conveyor. This bucket conveyor deposits its load upon the upper deck of the storage conveyor, which carries it either to storage or to the main tipple.

Coal that passes over the screens at the river tipple collects in a bin, from which it may be discharged to the weigh hopper in such quantities as are desired by the tipple operator. After weighing, this material is released to another pocket having sloped sides and a hole at the bottom through which the coal drops upon an apron conveyor, which in turn deposits it upon the river loading boom. This boom is a 90-ft. all-steel structure on which is mounted an endless belt conveyor. It may be swung up or down stream through an angle of 180 deg. and it can be raised or lowered at any angle. This makes it possible to load coal into barges satisfactorily at any stage of the river.

Coal that is to be stored falls from the conveyor into the storage basin. When this becomes filled, the material is spread out or moved to a more remote position by means of a scraper, propelled by block and cable, from a small clutch type of drum hoist. By this same means the coal is drawn back to the basin in the process of reclamation.

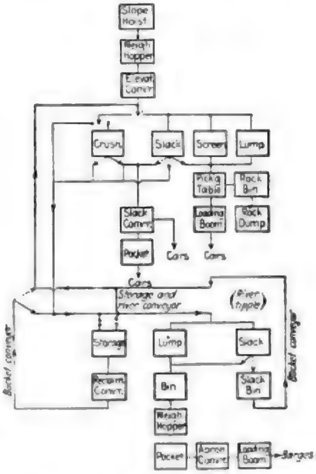
SHORE VIEW OF RIVER TIPPLE AND LOADING BOOM

The control of this boom is vested in the weighman, who can look out of the window and see just how loading is proceeding and who by pressing a button can stop the conveyors from his position at the weigh scale. However, the barge loader can "bell" him if at any time he becomes so absorbed in his weighing that he overlooks the needs below.

The basin itself is of reinforced concrete, with sides sloped at 45 deg., outlets being placed at intervals in the bottom. The flow of coal, or its stoppage, is effected at these outlets by the manipulation of slide gates, hand-operated through racks and pinions, which discharge to the tunnel beneath the basin.

In reclaiming, the gates are opened and the coal falls upon an apron conveyor that carries it to the pocket, where a bucket elevator delivers it to a chute above the main storage and river conveyor. Here, by proper trap adjustment, it may be directed either to the lower deck of the storage and river conveyor and carried to the river, or onto the upper deck and returned to the main tipple for preparation and loading into cars.

From the preceding enumeration of the various courses that coal may take in being prepared for market—loaded onto railroad cars or into barges, stored and then reclaimed for disposition at either railroad or river tipple—it is evident that the system developed at Clifford mine is exceedingly flexible. It is not difficult to see that coal may be so handled that while screened fuel is being loaded upon certain cars, slack may be loaded on others, or it may be placed in storage, or loaded onto barges; that both tipples may be loading at the same time and at full capacity; or that either tipple may be loading coal from the mine and from storage simultaneously. Greater flexibility is difficult to imagine.



FLOW SHEET OF TWO TIPPLES AND STORAGE YARD

A conveyor works both ways when you use both upper and lower strands. It furnishes a simple and an effectual way of distributing coal. Driven by a 75-hp. motor this conveyor promptly meets all the needs which arise during the day's run. Here the river loading acts as a balance to the irregularities of railroad loading and vice versa.

An interesting feature in the layout of this plant is the method of starting and stopping, or in other words the control of the operation, of the various conveyors and other equipment from a remote point. This is accomplished through the agency of an electrical signaling and control system.

As all the motors required in this installation, with

CONVEYOR RECLAIMING COAL FROM STORAGE

This conveyor carries the coal to an elevating conveyor which in turn deposits the coal upon the upper or lower span of the bridge or storage conveyor.

the exception of one, are of the slip-ring type, it is necessary, for starting and stopping, to use either a large controller which in addition to having the usual secondary contacts is provided with primary control, or to have a secondary controller and primary switch. To mount these controlling devices at or near the motor, amid the dust that invariably accumulates under operating conditions, would be highly unsatisfactory from every point of view, especially from that of the man-power required, for satisfactory operation could be obtained only by placing an attendant at each individual motor.

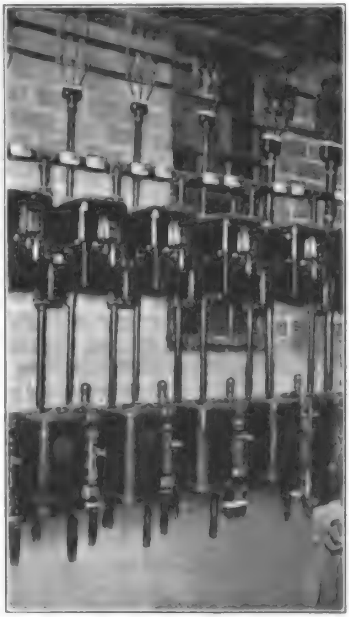
In order to overcome this difficulty, which would make the cost of handling prohibitive, in addition to resulting in sluggish and hazardous operation, a system was installed for controlling all the motors, with the exception of the two affecting only the river loading, from a hoist house located approximately 150 ft. from the nearest motor. Here the control is concentrated. In this manner the apparatus is freed from the injurious action of quantities of dust and dirt, and the operation of the motors requires only the part time of one instead of that of several men, for the work of handling the control does not add enough to the hoistman's other duties to prevent his giving them proper attention.

RECLAIMING CONVEYOR IN TUNNEL BENEATH STORAGE

Also shows the gate-valve mechanism for controlling the flow of coal from storage and the push-button controlling station.

Power, which is 2,300-volt three-phase 60-cycle alternating current and which is stepped down to 220 volts by means of a bank of three 100-kva. transformers of the single-phase type mounted just outside the hoist-house, is brought into the building to feeder-busses and by them distributed to the various motor circuits. Each of these motor circuits is controlled by means of a triple-pole single-throw knife type of disconnecting switch as well as an oil switch that provides both undervoltage and inverse time limit overload protection.

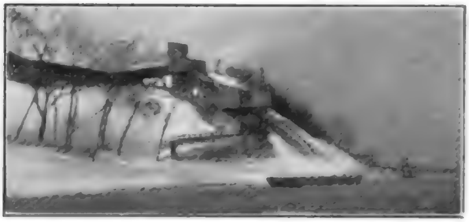
A framework of 1¼-in. iron pipe supports the oil circuit breakers and the secondary control, which consists of controllers and starting resistors. This arrangement adapts itself to a satisfactory grouping and mounting of this equipment. Into the supporting rack is built a system of signal lights—two above each circuit breaker—for indicating the motors to be started. At one end also is mounted an electric signal horn the purpose of which is to attract the operator's attention. From this central control point the conductors of both primary and secondary circuits are led underground, through iron conduit laid in concrete, to the main tipple and to the respective motors.



CONTROL EQUIPMENT IN HOIST HOUSE

Two lamps mounted above the oil circuit breakers are the agents by which the hoist engineer is notified. The men about the plant can signal their needs, but it is the hoist engineer that starts the motors by which the machinery is set moving. The latter does not have so strenuous a time as a shaft hoistman, for here a continuous rope haulage is installed.

Now, with the control equipment all located at this one point, to govern the operation of motors at places anywhere from 150 to 350 ft. distant—the 75-hp. motor circuit is approximately 350 ft. in length—a series of control push-button stations has been installed at various points about the plant. These buttons have been



ANOTHER VIEW OF RIVER TIPPLE AND LOADING BOOM

As seen from the river. The whole tipple is located above the high-water mark. Coal is stored on the level ground above the steep river bank.

placed in positions most accessible to the man handling the operation. They are of such a character and are so connected to the primary circuit breakers and to the signal lamps and horn of the various motor circuits that the same button serves either as a starting signal or as a remote "stop" station.

The sequence of operations when signaling for a start is as follows: The workman at the push-button station pushes the appropriate button twice in quick succession, thereby flashing the signal lamps above the control of the particular motor to be started and simultaneously sounding the signal horn. This notifies the hoistman that that motor is to be started. He must then see that the secondary controller handle is in the "off" position. A magnetic interlock requires that he do this before he can close the primary circuit-breaker. When this is done he closes the circuit-breaker and moves the controller around in the usual manner to the full running position.

When any workman desires any motor to be stopped he presses the appropriate button once. This trips out the primary circuit-breaker, flashes the lamps, and sounds the horn. This signal indicates to the hoistman that the motor has been stopped and that he must be ready to start it when the signal to do so is given. By means of this method the motors and the conveyors driving them are sure to be started with the proper sequence of operations and with the least possible delay.

WORKMEN CAN STOP MOTORS BY BUTTON

In addition to buttons for stopping the motors and signaling for their start, each station is supplied with a button the pressing of which trips the oil circuit-breaker of the feeder panel controlling the tipple and storage-yard feeder circuit. The purpose of this provision is to allow of the complete stoppage of the entire plant by any of the workmen in case of accident.

The control of the two motors not started by the hoist operator is located in the weigh house of the river tipple. In starting these machines the weighman performs the operation in the usual manner, a window alongside the controllers allowing him to see exactly what is happening. To stop the conveyors, he need only push the appropriate button of a station located within easy reach. Pushing this button trips the circuit-breaker and stops the motor without the necessity of his leaving his position at the weigh scale. When he is weighing coal, however, he may overlook what is going on below, so a signal bell is provided in the weigh house which may be sounded at the will of the barge loader by means of a signal line and hand push button. In this same control station buttons for the main or storage and river-tipple conveyor are installed as well as for the main storage feeder panel to which reference already has been made.

This highly flexible system of coal storage and handling, the practicability of which is made possible by the electrical layout, enables the Central Coal Mining Co. to combat to a remarkable degree the seasonal character of the industry of which it forms a part. Similar or at least comparable layouts could doubtless be installed to advantage by other coal operators.

Nine Killed and Three Injured When Windy Shot Explodes Marietta Mine

SPECIAL CORRESPONDENCE

ONE of the most disastrous mine explosions within recent years within the entire Tug River field of Kentucky and West Virginia occurred at 4 p.m. on Feb. 7, when the mine of the Marietta Coal Co., situated near the mining town of Peg, Pike County, Kentucky, on Pond Creek, about twelve miles out of Williamson, W. Va., and near Stone, Ky., blew up and snuffed out the lives of nine men and seriously injured three others.

The Marietta operation, which is controlled by the Deegans interests of Huntington, W. Va., is located on the Williamson and Pond Creek Division of the Norfolk & Western R.R. The mine, a small one, employing some twenty men and producing in the neighborhood of 200 tons daily in two shifts, is developing a small acreage of the Pond Creek seam of coal. It is not electrified, and mining operations have been carried on in a small way since the plant was first opened.

The Pond Creek seam is not considered gaseous, and open lights are used at all the operations on the creek. The explosion took place as the day crew was preparing to leave the mine. Only twelve men were inside when the accident happened, the three men who were injured being near the entrance when the blast let go; otherwise perhaps every one of those within would have been killed.

The blast occurred late in the afternoon when the men started shooting the coal in the various working places preparatory to the entrance of the night loaders. As the mine employs no cutting machinery of any kind and the coal is shot off the solid it is quite possible that a blown-out, or windy, shot precipitated a dust explosion.

The interior of the mine, to which access is gained through a drift opening, was badly damaged, practically all timbers, rails and cars being swept clear of the path of the expanding wave. Volunteer mine-rescue crews, with apparatus borrowed from nearby and larger operations, entered the workings shortly after the explosion and soon succeeded in removing all of the dead and living.

This is the second explosion on Pond Creek within the last four months. On Oct. 17 the Black Diamond mine, near the mouth of Pond Creek, exploded and killed Joseph Gooslin and Otis Bracher. That blast, like that at the Marietta mine, was ascribed to an improperly charged "solid shot" which ignited coal dust. The findings and recommendations of the Kentucky Department of Mines will be awaited with considerable interest by the smaller operators in the district. It is probable that severe restrictive legislation will be enacted to make such accidents less frequent.

BRIQUETTING PLANT OF PORT SANTLEY NUKOL CO., ON NORTH SHORE OF LAKE ERIE, ONTARIO, CANADA

Ontario Establishes Another Plant for Briquetting Anthracite Fines with Crude-Oil Residuum

Methods of Drying Coal, Receiving Binder and Intimately Mixing It with the Coal—Steam Size Anthracite Brought to Plant in Summer to Avoid Freezing Difficulties—New System of Cooling Briquets

By J. B. McGraw
Newark, N. J.

THE initial briquetting plant of the Nukol Fuel Co., located in Toronto, Ont., began operations on Jan. 1, 1920. As from the beginning the demand for its product far exceeded the capacity of the equipment, it was at once apparent that additional plants would have to be built.

After a careful study of the market situation it was decided to place the second plant in the western part of the province. Next came the question of definite location and the selection of a site. Bearing in mind the importance of transportation facilities and an adequate storage space for raw coal, a 5-acre plot finally was selected at Port Stanley.

Port Stanley is situated on the shore of Lake Erie, which will afford the raw materials excellent water-shipping facilities. Its location also will permit the shipment of a considerable tonnage of briquets at the low freight rates obtainable by water to points on the Ontario shore. The site selected also is provided with facilities for rail transportation by way of the London & Port Stanley R.R., the main line of which extends along one side of the property. A spur has been run in and branch sidings laid so as to permit easy movement of incoming raw materials and outgoing briquets. This road serves as a feeder to four of the principal railroads of Canada: namely, the Grand Trunk, Canadian Pacific, Michigan Central and Pere Marquette; thus the plant readily will be able to distribute its product to all parts of the province.

A subsidiary to the parent company, known as the Port Stanley Nukol Co., was organized and contracts executed with the General Briquetting Co., of New York, for the design and construction of the plant and the right to use the Dutch process of briquet manufacture. The plant is designed for a capacity of 15 tons per hour and thus by double-shift operation can produce 300 tons per day.

In briquetting the selection of a suitable raw coal is of paramount importance. To meet the exacting requirements of the trade a briquet must be equal, if not superior, in fuel value to coal of the same size. It must therefore be made of a raw material containing a minimum of ash; as a rule not over 15 per cent. An abundant source of such material is found in the river-washed coals of Pennsylvania, and the company has options upon a large supply.

To avoid the difficulties incident to the transportation of the raw coal in freezing weather a reserve of approximately 30,000 tons will be stored during the warm months for the winter's operation. This coal will be unloaded from cars or barges by a locomotive crane fitted with a grab bucket. It will be stocked in a rectangular pile adjacent to the plant. The crane also will serve as a locomotive for moving cars into and out of the plant to and from the main siding.

Binder, which in this case is a residuum obtained in

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[*] Port Stanley is a few miles from London, Ont., and lies midway between Detroit and Toronto, at which latter city is another briquetting plant of somewhat similar construction.

the refining of crude oil, will be received at the plant in tank cars. A short spur track extends into the factory building, and here, in a space partitioned off for the purpose, the car will be housed until emptied. As the melting point is about 160 deg. F., the binder is hard at ordinary temperatures.

When received the tank cars, which are equipped on the inside with pipe coils, will be connected to a source of steam supply. After the binder has been melted to a thin liquid it will be withdrawn by means of a rotary pump and delivered to one of three storage tanks, each of which is 12 ft. in diameter by 10 ft. deep. They are built up of sections of heavy galvanized steel and have a combined capacity of 26,000 gallons.

At the bottom of each tank is a nest of 2-in. steam coils, by means of which the binder can be kept always hot and liquid. By a simple arrangement of steam-jacketed pipes and valves in conjunction with the rotary pump, the binder can be delivered directly from the car to any individual tank and an operating supply simultaneously maintained at the mixer. This obviates delay in unloading tank cars and at the same time makes only one pump necessary. The binder, being an oil product, has a high fuel value in itself, the proportion used adding more than 1,000 B.t.u. to the finished briquets.

Operation of the plant may be divided into five distinct phases: (1) Handling and drying of raw coal; (2) introduction of the binder and preliminary preparation of the briquetting mixture; (3) final preparation of the mixture by mastication; (4) molding and pressing the mixture into briquets; (5) cooling the briquets and delivering them to the storage bunker.

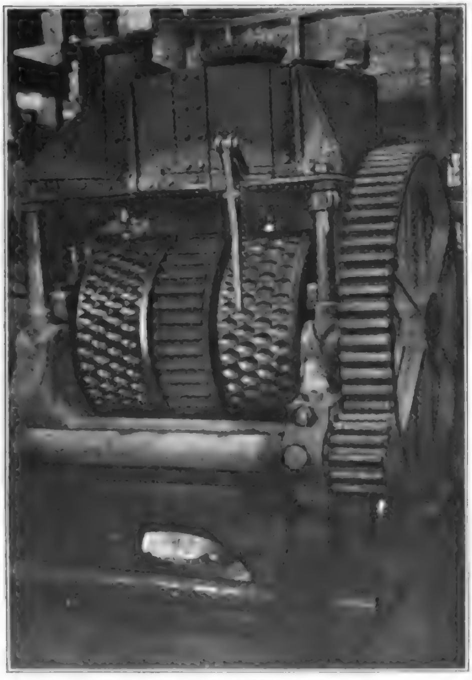

FIG. 1. PRESS FOR MAKING 4-OZ. EGGET BRIQUETS

Double rolls, 32 in. in diameter with 13-in. faces, make 368 briquets at each revolution, or 15 tons of product per hour. The rolls work two ten-hour shifts, making 300 tons per day. Each briquet is subjected to a pressure of from 1½ to 2 tons per square inch.

Raw coal will be taken into the plant through a track hopper equipped with an endless steel apron conveyor. This discharges to a bucket elevator, which delivers into a wooden bin situated above the drier. Incoming coal, when desired, can thus be delivered from cars directly to the plant without going to the stockpile. Fuel coal for the drier and boiler plant may be handled in the same manner. A bypass chute from the top of the elevator delivers this fuel directly to a large bunker situated in front of the furnaces.

To reclaim coal from the stockpile a special self-dumping hopper-bottom car will be used that will be filled by the locomotive crane and by it placed over the track hopper. This car will hold about 50 tons and can be emptied in less than an hour. As the capacity of the plant is 15 tons per hour, this arrangement gives a leeway of two hours for filling and moving the car. In the meantime the crane may be employed in unloading other cars or in shifting empties to be filled with briquets. To make this arrangement complete, the bin above the drier was built of such size as to hold 50 tons, or a three hours' supply for the plant.

REDUCES MOISTURE CONTENT 80 PER CENT

Because of the washing process through which it has passed, the fine raw coal when received at the plant will still carry 10 to 12 per cent of moisture. To be suitable for briquetting, the coal must have its moisture content reduced by drying to about 2 per cent. A drier of the single-shell rotating type, 6 ft. in diameter and 40 ft. long, is employed for this work. The receiving end projects into a Dutch-oven type of furnace located directly beneath the wet-coal bin. The coal is delivered to the drier from the bin in a measured flow by means of an apron conveyor and a cast-iron chute, passing through the roof of the furnace. The flow of coal is accurately controlled by means of an adjustable gate attached to the bin and operated in conjunction with the conveyor. This insures that the drying will be uniform and to any moisture percentage desired.

The coal passes through the drier in contact with the hot gases and is delivered at the opposite end into a brick dust-chamber. A suction fan mounted on top of this chamber furnishes induced draft for the furnace and carries away the water vapor and spent gases. The dried coal is carried away by means of a spiral conveyor and bucket elevator and is delivered into a bin at the top of the building.

Beneath this bin is a pug mill, or paddle mixer. This device consists of a horizontal steel trough with a shaft extending throughout its entire length, to which is attached a series of blades or paddles. These are set at a certain angle with respect to the axis of the shaft and in rotating impart a positive forward motion to the material fed in at the receiving end. Coal is introduced into this machine in a uniform, measured flow by an apron conveyor that forms the bottom of the bin.

The binder, carefully measured in correct proportion to the coal by means of a specially designed needle valve, is introduced at this point. This is a highly important part of the plant, and great care must be exercised by the attendant to maintain the correct proportions. Too little binder results in a weak briquet that will disintegrate on subsequent handling, and too much binder results in a soggy briquet produced at an excessive cost. The stirring action of the paddle mixer gives a preliminary mixing to the materials preparatory to fluxing, which is the next step in the operation.

The fluxer is a vertical cylindrical steel tank 40 in. in diameter and 6 ft. deep mounted on a cast-iron base. A shaft within this container carries a series of radial arms and rotates at a uniform speed. Stationary arms attached to the inner surface of the tank project toward the center. The partly mixed material is dropped into the fluxer from the paddle mixer. Here the ingredients are further mixed, or, as it is termed, fluxed, in the presence of steam, which is admitted through openings in the bottom of the tank. This serves to moisten the mixture, or flux, as it is now called, and gives it a peculiar plasticity that facilitates the final mixing, or mastication. The flux is delivered directly into the masticator in a continuous stream, an adjustable gate regulating the flow at a rate that synchronizes with the delivery of the material into the fluxer.

Flux Is Kneaded with Coal in Masticator

The next and most important step in the operation of briquet manufacture is the mastication of the flux. The masticator is a ponderous Chilean mill, or arrastre. It consists of a heavy cast-iron bed securely bolted to a massive concrete foundation, two A-shaped standards mounted on the bed carrying the steel framework that supports the drive gearing and two huge cast-iron rolls, each weighing several tons, arranged to chase around the bed at eighteen turns per minute. The flux is fed in at the outer edge of the bed and is gradually moved over by a series of adjustable plows to the center, where it is discharged.

Meanwhile the heavy rolls repeatedly passing over the fluxed material grind and masticate it to such an extent that the coal and binder are intimately mixed. In fact, the binder is literally ground into the coal, and the material has been changed into a practically homogeneous mass.

The value of this treatment can hardly be exaggerated. Without it the briquet would be a mere mixture of comparatively large coal particles partly coated with the binding substance unless an excessive proportion of binder has been used. It would consequently lack cohesion and be extremely susceptible to breakage and weathering. A briquet made from masticated material has a firm, dense structure with a hard shell-like surface. It is impervious to moisture, resists weathering and may be handled with practically no breakage.

Paddle Conveyor Breaks Up Caked Material

Under the masticator is a conveying device, similar in design to the paddle mixer previously described. This receives the masticated flux, reduces any caking which may have resulted from the heavy pressure of the rolls and delivers it to a bucket elevator that carries it to the press.

The press is of the so-called Belgian roll type, now quite familiar to the industry. The rolls in this case are double, 33 in. in diameter and have 13-in. faces. Each has four rows of pocket molds in staggered formation, 46 molds to the row. Thus a total of 368 briquets are made per revolution. These are of egget shape, each weighing about 4 oz.

Superimposed on the press is a feed box consisting of a vertical cylinder about 18 in. deep with adjustable openings in its bottom. Rotating arms force the flux through these openings, maintaining a constant flow to the rolls. The briquets are formed under a pressure of 3,000 to 4,000 lb. per square inch.

Dropping from the press the briquets fall directly into a bucket elevator, which carries them to a rotating cylindrical screen. The peculiar shape and arrangement of the molds cause a small quantity of material to adhere to each briquet in the shape of a rough edge or fin. The tumbling action of the screen removes this material and also eliminates occasional weak or imperfect briquets. This waste is returned directly to the masticator to be reworked.

Material to be briquetted passes through the press in a heated state, usually at 125 to 140 deg. F., and though the briquets at this temperature are strong enough to withstand the action of the elevator and screen, they are still so plastic that they would crush under the imposed weight of piling in a car or bin. It is necessary therefore that they be thoroughly cooled.

In the ordinary plant the briquets are cooled either by immersion in water or by carrying them in a thin layer on an endless chain or belt conveyor exposed to the atmosphere for a sufficient length of time to reduce their temperature to the desired point. At this installation, however, water cooling was not attempted because difficulties would inevitably be encountered in freezing weather. Briquets of the size of these give up their heat slowly and a conveyor long enough to cool them would be unduly expensive.

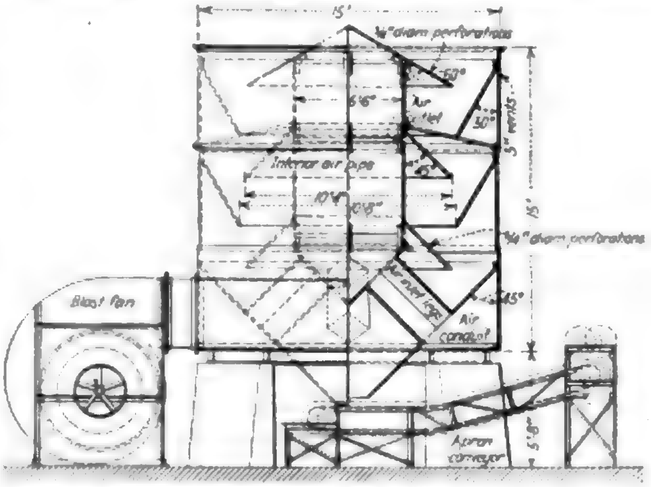

FIG. 2. DEVICE FOR COOLING AND HARDENING BRIQUETS

Air is forced into the tower down which the briquets slowly fall, being deflected by plates. The plates on the inner chimney are perforated and the air thus comes in close contact with the moving briquets, which on entering the tower at the top are almost at the temperature at which they leave the briquet press, which is between 125 and 140 deg. F.

A new type of air cooler, Fig. 2, which I designed several years ago, was adopted as being best suited to this plant. This device consists of a vertical steel tank 15 ft. in diameter and of equal depth. It is mounted on a concrete base. Extending through the center of the tank is an interior tower, or pipe of large diameter, which serves to conduct and distribute the cooling air.

Forming the top of the inner pipe and extending beyond its periphery is a cone the projected area of which is about half the area of the main tank. In order to give the briquets an inclined descent and at the same time break up the mass into sections of small area, keeping the individual briquets in motion relative to each other, a series of plates, or cones, are provided, so arranged that the briquets pass over first one and then the other as they move downward through the apparatus. These deflecting plates are placed alternately on the interior pipe and the exterior casing.

A funnel-shaped plate, attached to the exterior casing about 3 ft. from its lower edge and converging in the center with an opening for discharging the briquets, forms the bottom of the tank. The interior pipe is supported from this plate by four hollow legs. The annular space beneath the bottom plate is sealed and serves as a conduit for the air.

The required volume of air for cooling is supplied by a large fan connected to this annular conduit. From this chamber the air goes through the hollow legs into the interior pipe. A series of gaps, or openings, allows it to escape at points beneath the interior deflecting plates. These are perforated with many small holes, so that the air passes directly through the mass of briquets, absorbing their heat and finally escaping through vents in the outer casing to the atmosphere. The fan develops a pressure of about 1 oz. per square inch and maintains a constant circulation of air throughout the entire tank.

The briquets are received at the center of the cone top. In operation the tank is kept full, the discharge being controlled in accord with the input. The tank will hold fifteen tons, or an hour's output of the plant, and the briquets will thus be subjected to the cooling action of the air for this same period.

From the cooler the briquets are taken by an apron conveyor and thence by a bucket elevator and belt to the storage bin, or pocket. This is of wood-frame construction 21 ft. wide, 60 ft. long and 25 ft. deep. It has a capacity of 500 tons. A scraper conveyor at the top receives the briquets and distributes them throughout the length of the bin. Several so-called fish-ladder chutes under the conveyor extend to the bottom of the pocket. They lower the briquets by easy stages, thus avoiding the breakage that would be incurred by a direct drop. The briquets are drawn from the bottom and loaded on one side of the bin into cars for shipment or on the opposite side into trucks for local delivery.

PLANT MUST RUN STEADILY WHEN STARTED

Steam power is employed for driving this plant. In the preliminary plan provision was made to use electricity, but upon investigation it was found that the local power company was so overloaded that it could give no assurance of an adequate or continuous energy supply. When once started a briquetting plant should be operated without any interruption; therefore it was decided to take no chances with uncertain power.

Steam is supplied by two 150-hp. horizontal return-tubular boilers. These are equipped with the usual auxiliaries, including a Cochrane feed-water heater, utilizing the exhaust from the engine. Forced draft is supplied by a steel-plate conoidal type of fan.

A single-cylinder 22 x 48-in. Corliss engine has been installed. Power is transmitted to two main-line shafts through an "American" rope drive, Jupiter brand "Durable" wire transmission rope being used. This is a rope of special construction, being made up of steel strands, each covered with a specially prepared hemp marline. It combines the strength of steel with the flexibility of manila. It is particularly suitable in this case because the space available is hardly sufficient to permit the transmission of power by ordinary belting.

The completion of this plant marks a long step forward in the development of an industry that undoubtedly will have extended use in the Dominion. The middle eastern section, including the provinces of Ontario and Quebec, is the most populous of the entire country, yet is a region entirely devoid of coal resources. Anthracite is burned almost exclusively for household use and the supply is generally insufficient to satisfy the market, particularly during the winter months, when the demand is greatest and transportation facilities are at their worst. The establishment of each additional plant such as this contributes a measure of relief to this situation, and the briquetting industry of Canada should enjoy a rapid and healthy growth.

An Experience with Spraying Water on the Cutter Bar of a Mining Machine

By John Crawford[*]

RECENTLY, after completing my inspection of one of the large coal mines of Utah, I was resting in the foreman's cabin when a machine man entered who was just going on shift. He was breathing with difficulty and I remarked that the hill up which he had climbed appeared to be hard on him and that he must be getting old. He replied: "Anybody will get old if they stay with a mining machine. I am so filled up with bugdust that I have scarcely any room left to breathe through. Mr. Crawford," he continued, "if you could get us a sprinkling hose, so we could sprinkle water on the left side of the cutter bar, you would be surprised at the effect that it would have on the dust."

Just then some other machine men came into the cabin and I questioned them regarding their experience with the spraying of water on cutter bars. They all confirmed what the first man had said.

In less than a minute after we had applied water to a cutter bar we could see and feel a remarkable change for the better. By the time the cut was within three feet of the left rib of the room the place was cool and the air clear. When the machine got to this point the hose became too short to reach the cutter bar, and while cutting the remaining three feet without water the air again became filled with dust.

We then went to another part of the mine and found a machine just ready to cut the face of an entry. We had plenty of hose with us this time and connected it to the ¾-in. water line. This gave us an opportunity to observe the effect of water when it is applied as soon as the machine starts a run. A small stream was kept playing on the cutter bar all the time the machine was at work. When the cut was completed the face of the entry was as cool and free from dust as it was before the machine started. In both cases the water was applied to the left side of the cutter bar. This is the side on which the bits travel back toward the machine.

Every mine in Utah is required by law to have water piped into every working place that is not naturally wet. This makes it easy to get water to the coal cutters. The allaying of dust is not only beneficial to the machinemen, thus keeping desirable men on the job, but it also is advantageous to the shotfirers who must inspect the place after shooting, also to the miner who must of necessity load out the bugdust and who prefers dampened dust to dust that fills his lungs with foreign substances. Furthermore no dry dust is thrown into the air when the shots are fired, and the danger of a dust explosion is greatly reduced.

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[*] Coal-mine inspector for the Industrial Commission of Utah.

Hoisting, Ventilation and Coal Extraction Symposia Are Outstanding Features of Institute Meeting

ORGANIZED inquiry is one of the keynotes of the American Institute of Mining and Metallurgical Engineers. There is no longer any attempt to treat all subjects with equal attention—or should it be termed equal shallowness?—but the aim seems now rather to concentrate on some few worthwhile subjects and get down to the marrow of them by hunting the information wherever it may be found and definitely deciding just where research is needed.

Perhaps it might have been well if the institute, whenever the members arrived at "No thoroughfare" signs on their journeyings, had suggested by resolution to those national bureaus which are always asking for guidance just what roads to efficient operation they would like paved and curbed for their use and convenience. Thus it was clearly evident that the Bureau of Mines would confer a boon on the mining industry if it would inquire into the life and efficiency of wire rope and continue its investigation into the coefficients of friction of the air in mine passages. But no resolution was passed to turn the aspiration into a concrete suggestion.

The one hundred and twenty-fifth meeting of the A. I. M. E. was held in the Engineering Societies' Building, in New York City, Feb. 20-23, about 1,300 persons attending. The morning of the first day was devoted to committee meetings, one on ground movement and subsidence and one on drill steel. The first proposes to make thorough inquiry into the effect of mining on surface measures, and it may clear up at last the extremely loose thinking on this subject which has been for years, and even now is, indulged in. The basis of fact is now provided, but even without it one is amazed to find that theory has blundered so blindly and wandered so far and long.

After lunch a symposium on wire ropes and hoisting, treated elsewhere in this number, was well attended by operating and safety engineers. The mining session, however, had nothing for coal-mining men.

In the evening the members met at a smoker. The Western Electric Co. had installed an audiphone which gave exhibitions of its power to transmit music over long distances. Vaudeville of the Alkali Ike variety, with a bar-room background, entertained the guests. Witty limericks written by Institute members were flashed on the screen and they with community singing helped to round out a pleasant evening.

The technical sessions of the morning were preceded by the annual business meeting, at which it was announced that Arthur S. Dwight was elected president; A. R. Ledoux and J. V. W. Reynders, vice presidents, and Charles F. Rand, George D. Barron, W. H. Bassett, William Kelly and Thomas B. Stearns, directors. Later at a directors' meeting Mr. Reynders was elected first vice-president and Mr. Rand treasurer.

The total membership numbers 10,205, of which 19 are honorary, 7,909 full members, 951 associates, and 1,326 junior associates. During 1921 1,284 were added to the institute and 402 resigned, died or were suspended for non-payment of dues. Receipts during the year were $198,846.56 and expenditures $157,743.04, leaving a balance $41,103.52. Unfortunately, the publishing of *Mining and Metallurgy*, if regarded as a free service to members, involved the A. I. M. E. in a loss of $8,684.96, the advertising, of course, being by no means clear gain. In fact 50 per cent and over of the advertising income was spent in printing and in selling space.

Later in the morning the safety session met to discuss ventilation. Its deliberations will be reported in a special article which will appear in this issue. The mining session considered a paper presented by Charles E. Stuart on storage-battery locomotives. As this was published in the issue of Feb. 16, pp. 276-282, and the discussion will appear in a separate article, nothing more need be said regarding this session, it being largely devoted to metal mining.

On Wednesday, Feb. 22, a mining session was held under the chairmanship of Howard N. Eavenson. At this session most of the coal papers were presented. The proceedings of this meeting will be reported next week in an article devoted to that purpose. A safety session also was held, at which papers were presented by C. W. Goodale, J. L. Boardman, C. D. Woodward and C. A. Allen. After lunch a joint meeting was held with the Mining and Metallurgical Society, at which Pope Yeatman, W. R. Ingalls and Edwin Ludlow delivered addresses.

ARTHUR S. DWIGHT

In the evening a banquet and dance was held at the Pennsylvania Hotel, the toastmaster being George Otis Smith and the two speechmakers Edwin Ludlow and Arthur S. Dwight. The place list showed that 631 were in attendance. The following day the members visited by special train several plants between New York and Perth Amboy, the Crucible Steel Plant at Harrison, N. J., the Bayway plant of the Standard Oil Co., the Chrome plant of the U. S. Metals Refining Co., the roofing plant of the Barber Asphalt Paving Co., the cable-fabricating plant of the Standard Underground Cable Co., and the copper-refining plant of the Raritan Copper Co., the associated industries of Perth Amboy furnishing lunch at the Y. M. C. A. in that city.

Institute Discusses Safety and Life of Hoisting Ropes

Difficulties Where Rope Winds in Many Layers on Small Drums—Factors of Safety—Great Accelerations in Coal Shafts—Shaft Accidents and Their Cure—Can Ropes Be Tested by Electricity?

UNDER the joint chairmanship of H. F. Lunt and B. F. Tillson, and the joint auspices of the American Institute of Mining and Metallurgical Engineers and the National Safety Council, a safety session was held on Feb. 20 to discuss "Wire Ropes and Hoisting," the first paper being read by W. B. Daly on behalf of W. N. Tanner and F. C. Jaccard, who were unable to be present. It related to rope hoisting and safety in hoisting at the Butte mines. These operations, being by no means new, have certain inherent defects, as indeed the paper well recognized, but the methods adopted to meet the difficulties are only the more valuable and suggestive to those who have to meet similar conditions from which there is no ready escape.

The authors said that flat ropes from ½ x 7½ in. to ⅜ x 4½ in. were being discarded in favor of round ropes because of the loss of alignment at some of the shafts. Other difficulties are drums of only 12-ft. diameter for 1½-in. rope and 6-ft. for 1¼-, 1⅛- and 1-in. rope. The ropes are wound on the drums in from two to four layers. These ropes are special "Blue Center" steel ropes, either regular or lang lay, and are fastened to the cages by clamps. On the smaller drums approximately one-half of the first layer remains on the drums at all times, in order to insure the rope reeving properly, this portion being tapped into place by a light hammer while the rope is being installed, thus preparing a perfect helical surface for the reeving of the second and succeeding layers.

With 6-ft. drums the general practice is to allow one-half of the first layer of rope to remain on the drum at all times, for, because of the peculiarities of round-wire rope, this part of the first layer will not wind uniformly when hoisting the load. The first layer must wind uniformly on the drum, as, with the straight-faced drum, the first layer of rope must form the grooves for the succeeding layer, and these grooves must be uniform to guide the succeeding layers into their proper position across the drum face.

BIG FLEET ANGLE MAKES ROPES INTERLOCK

On installations using small smooth-faced drums and where the fleet angle is severe, ropes have a tendency to interlock when winding on the drum. This, together with the smaller diameter occasioned by the elongation of the rope under load, causes the groove made by the first layer of rope to be slightly less in pitch than the diameter of the rope. This causes the second and succeeding layers to be pinched together, with pronounced abrasion of the rope in service.

When installing a new rope on a smooth-faced drum it must be started so that it will wind on the drum in a true helix. To accomplish this a starting piece must be introduced at the flange where the rope is attached. For this purpose a manila-rope starting piece was used, but it was found impossible to fit this manila rope on the drum so that it would cause the rope to reeve in a true helix. Now all drums are equipped with a steel starting piece machined to exact form. This starting piece extends completely around the drum and gives satisfactory results.

In the discussion Mr. Daly said that the speed for hoisting rock was 2,000 ft. per minute and that the Lilly safety gear was used, which he said slowed the hoist down without needless jolt. Mr. Daly said that the only danger was that, after the cage had come slowly to the dump level, the engineer might forget to reverse and on starting might pull the cage into the sheave wheel. In this case, however, the speed attained in the short distance traversed was not such as to result in much damage.

Mr. Colburn, of the Bureau of Mines and National Safety Council, wanted to know if the detaching hook was used as well as the Lilly safety gear, and was told that it was not. Rudolph Kudlich, of the Bureau of Mines, said that the Welch overwind device as now modified not only gave slow stopping but also provided against starting on the reverse.

WHY USE SMALL DRUMS AND MANY ROPE LAYERS?

Robert Peale, professor of mining, School of Mines of Columbia University, asked why large drums requiring only a single layer of rope were not used in the Butte district, as they were, for instance, in the Lake region, and why small cast-iron sheaves were used instead of large bicycle-type sheaves of 12- to 14-ft. diameter. Mr. Daly replied that the equipment used had been installed many years ago and space around the shafts prevented changes in drums.

Graham Bright said that the large rope hoist with a 30-ft. drum was excessively expensive and that the smaller drums revolving at higher rotational speeds were better suited to electric equipment.

R. M. Raymond, professor of mining engineering, School of Mines, Columbia University, then presented an interesting article on "Safety Practice in Hoisting Ropes." He stated that none of the state laws fixes a factor of safety, though the Canadian mining law stipulates a factor of safety of six in shafts less than 2,000 ft. deep, and in shafts 2,000 to 3,000 ft. not less than five. The South African commission has shown that shocks due to changes in velocity are dangerous only to short lengths of rope. The New South Wales mining law requires that a rope shall be tested before use and in hoisting mineral have a factor of safety of eight, and in hoisting men, of ten.

The factors of safety recommended by the committee framed to suggest a model metal-mining law for the United States will be found in Table I.

TABLE I. FACTORS OF SAFETY RECOMMENDED FOR HOISTING ROPES.

Length of Rope in Feet	Minimum Safety Factor for New Rope	Minimum Safety Factor At Time Rope Is Discarded	Percentage Reduction When Rope Is Discarded
500 or less	8	6.4	20.0
500 to 1,000	7	5.8	17.0
1,000 to 2,000	6	5.0	16.5
2,000 to 3,000	5	4.3	14.0
3,000 and over	4	3.6	10.0

Another table shows the rates of acceleration in various mines and the length of haul. It is interesting to note that the acceleration in a coal-mine shaft exceeds that in all the mines with which it is compared. Prof. Raymond's table has been rearranged in Table II with the idea of listing the items according to the acceleration speed.

TABLE II. HOIST ACCELERATIONS IN VARIOUS MINES.

Plant	Shaft	Average Length of Haul, Feet	Maximum Hoisting Speed, Ft. per Min.	Acceleration, Ft. Per Sec.	Distance to Reach Maximum Speed	Time to Reach Maximum Speed, Seconds
Old Ben Coal Corporation	Vertical	475	3,600	12.00	150	5
Great Boulder Prop., Boulder, W. A.	Vertical	2,000	2,000	5.85	95	6
Calumet & Arizona, Warren, Aris.	Vertical	1,500	1,600	5.33	70	5
Sulphide Corp., N.S.W., Australia	Vertical	825	3,650	5.05	300	15
United Verde Copper Co., Clarkdale, Ariz.	Vertical	850	2,000	4.70	115	10
N. J. Zinc Co., Franklin, N. J.	Inclined	915	3,000	3.33	375	15
North Butte Co., Butte, Mont.	Vertical	3,600	2,700	2.53	400	17
Copper Range Co., Painesdale, Mich.	Inclined	1,500	2,360	2.48	130	10
International Nickel Co., Creighton, Ont.	Inclined	1,600	1,100	2.33	260	15
Republic Iron & Steel Co., Birmingham, Ala.	Inclined	5,400	2,200	1.47	459	25
Witherbee-Sherman Co., Mineville, N. Y.	Inclined	1,000	1,200	1.33	150	15

Though the length of hoist in the Old Ben Coal Corporation's shaft is the shortest recorded in Table II, the maximum hoisting speed in the mines listed is only exceeded by that at a mine located in New South Wales, Australia.

James F. Howe, wire and rope engineer, American Steel & Wire Co., then presented a paper on the "Use of Wire Rope in Mining Operations." He said that the objection to lang-lay rope was that so few could splice it. That was not an objection in a shaft, for the shaft rope should never be spliced. The lang-lay rope is more than usually desirable where the rope drags or rubs, as frequently occurs on an incline or on a more or less level haulage road or where several layers of rope are used on a drum. A new lang-lay rope, composed of the same number, size and strength of wires, is from 4 to 8 per cent stronger on an actual breaking test than a regular-lay rope.

A newly made rope will never show as much strength as one that has been in use for a few days under normal load. The strands in service embed themselves into the hemp center in the manner in which they are to work and in the first 30 days the rope will stretch about 1 per cent. A test of such a rope after, say, 30 days of operation will invariably show a higher tensional strength than in the original test. This gain in strength may amount to nearly 10 per cent. Some ropes that have been condemned have shown, on actual test, tensional strength in excess of their original strengths, even with several broken wires in the section being tested, substantiating the fact that the strength of a rope increases somewhat after the rope is put into service.

The author carefully discussed the various causes aging rope—exterior wear, breakage of individual wires, corrosion by acid water, alkali water or electrolysis, by loss of elasticity, by fatigue in the metal of which the wires are composed, by regular or reverse bending, by load variations resulting from shocks due to starting and stopping by overloading and by torsion at or near attachments.

He pointed out that three or four wires broken in one spot were a far more dangerous indication than twice that number spaced 2 or 3 ft. apart, even if in the same strand. The whole question of the strength remaining in a rope with broken strands simmers down to the query: Are the breaks in the wires so distributed as to make the failure of the rope likely or unlikely? However, when one wire breaks those on either side are apt to become displaced and break in consequence, so that when wires begin to break, the rope will bear close inspection, for otherwise it may become dangerously weak.

Four or five broken wires in one place in a rope strand leave the rope unsymmetrical and in case of a shock or surge of load that strand may give way and necessitate the immediate removal of the rope. A rusty rope is stiff and the wires break quickly as they become cemented together by rust. The only remedy is to have the ropes well lubricated. No chances should be taken with a corroded rope; it is stiff, inelastic and potentially dangerous.

EVERY COMPANY HAS ITS OWN DISCARDING RULES

Aside from the number of wires broken and their distribution and the reduction in diameter, ropes may be discarded after a certain number of tons hoisted or handled, a certain number of trips made, a certain period of service or a definite number of miles traveled. It is clear that in the idle time of a rope it is by no means free from injury, for corrosion usually is more active then than when the rope is working. A well-chosen composite factor based on length of service and work in service, however, probably will give the best results.

Rudolf Kudlich, of the U. S. Bureau of Mines, then presented a paper on "Safety Devices for Mine Shafts," in which a careful analysis was made of accidents in shafts and the means by which they can be prevented. Analyzing the causes of shaft accidents in Pennsylvania, West Virginia, Illinois and Ohio in the ten years between 1904 and 1913, he had found that 199 accidents to individuals out of 1,001 (19.9 per cent), or 192 separate accidents out of 801 (24 per cent), were due to "falling down shafts," making this by far the leading cause of accident.

This type of injury and death is readily avoided by the use of shaft gates. These should be placed as near the shaft as possible and should operate in a vertical rather than in a horizontal plane, both to reduce the space required and to eliminate the possibility that the closing of the gate will sweep men into the shaft. They should be at least 5 ft. and preferably 6 ft. high to prevent men leaning or looking over them and should be strong and well braced. Springs or other cushions should be provided to reduce the jar as much as possible.

DEADLY RAIN FROM THE SELF-DUMPING CAGES

Next in importance is the risk of being struck by objects falling down the shaft. As many as 145 accidents to individuals out of 1,001, or 14.5 per cent, have been so caused. These can be prevented by keeping objects from falling and by keeping the men from coming near the shaft where these objects are likely to fall. The more modern cage dumps are so designed that the car is carried some distance from the shaft before the actual dumping period commences, so that there is little likelihood that any coal will fall back into the shaft.

The older cages dumped directly at the edge of the shaft and almost every car dumped was followed by a rain of coal down the shaft. Foreign objects falling into the shaft at the surface generally can be avoided by suitable fences and toe boards, but those falling from timbers can be eliminated only by unfailing care on the part of shaft repair men and inspectors.

The most successful remedy is to keep the men at shaft landings out of the danger zone. This is quite possible by the use of automatic caging devices. They are of benefit in so many ways that it is difficult to understand why they are not more generally installed. From the safety standpoint the automatic device eliminates entirely the need for men working directly at the shaft when hoisting coal.

These devices usually reduce the number of men required at the landing and reduce the work they are required to do, so that they are able to keep the same pace during the entire shift. Except where a caging crew has worked together so long that the men coordinate like parts of a machine it usually happens that the speed of caging is considerably increased by the use of caging devices.

OVERWINDING THIRD IN SHAFT-ACCIDENT LIST

The class of shaft accidents which is as much feared, perhaps, as any is overwinding. It comes only third, however, in the number of individual accidents and as it involves several men where it occurs, it comes seventh in a list of accidents when tabulated without regard to the number of men involved in any one accident. Mr. Kudlich described several of the preventive devices without detailing any one in particular.

He stated that the equipment against overwinding, if desired, can be fitted with other devices by which a low speed limit is set when hoisting men, and when the surface landing instead of the dump level is made the terminal point of the hoist. This attachment must be made operative by the engineer, but as a check on him a signal light at each shaft landing automatically indicates whether it has been set.

A substantial bar or bolt slipped through a hole bored in a shaft guide a short distance above the entry level will prevent the cage descending to the landing when men are in the sump, but, as Mr. Kudlich shows, this would not have prevented all the 105 accidents caused in the states mentioned in the decade between 1904 and 1913, men being killed while crossing the sump instead of going round by the passageway, by falling or slipping into the sump while caging cars or by being pushed or falling while trying to get on the cage to ascend the shaft.

GATES RARELY PLACED ON COAL-SHAFT CAGES

Pointing out the general use of cage gates in metal mines and their almost universal absence on the cages of coal-mine shafts, Mr. Kudlich said that the metal-mine cages being small and the number of men carried large, gates were the more necessary to prevent men being crowded off. The state laws in coal-mining states limiting the number on a cage to ten or twelve acted as a safeguard but that they are not sufficient is proved by the fact that 179 were killed or injured by falling off the cage or being caught between the cage and the shaft timbers.

The accidents were due to jostling or playing when riding on the cage or to attempting to get on or off the cage after the signal to hoist had been given. Bars and chains may assist in promoting safety in the hoisting, but they do not prevent men from trying to enter or leave the cage after it has been "rung away."

The danger in sinking, which may not be termed by some a mining hazard, because the work usually is done by a contractor and not by the mining company and because it is frequently not under the control of any mine inspector, consists largely in the crosshead or "billy," a simple wooden frame traveling between guides which steady the rope and keep the bucket from swinging. The crosshead usually simply rests on clamps on the rope, so that the rope is free to pass through the crosshead if the latter is kept from descending. Should the crosshead stick on a lump of ice or a tight place in the guides it may be held back temporarily and then when the bucket has lowered many feet it may work itself loose and fall, breaking the rope or attachment. For this possibility protection has been devised. A catch is introduced which automatically grips the rope and locks the crosshead and rope together, except when the former is resting on the stop locks at the foot of the guides and the grip on the rope is released.

In mines where coal or other mineral is hoisted from several levels the cage may run into landing fans or keeps which the foot tenders have not removed or the engineer may forget to which landing he is to lower the cage. One large anthracite company has a movable mark on the indicator dial of the hoist which shows which level is being served at the time and it also has red and green lights on the target to indicate the position of the keeps at each landing. The landing keeps and car blocks at each level are interlocked, so that the keeps must be withdrawn to set the safety block protecting the shaft.

SHAFT ROPES SELDOM BREAK WHEN HOISTING MEN

The average mine worker dreads the breaking of a hoisting rope more than any other accident that may occur in a shaft, yet only four times in ten years in the states covered by Mr. Kudlich's compilation did a rope break while men were being hoisted. Safety catches are not always reliable, especially if the rope breaks near the drum, in which case there is a degree of tension on the rope and the catches are not effective or act only so as to slow down the fall of the cage. The rope usually breaks between the cage and head sheave, however, and in that case the catches should come into effective action.

To render absolute protection under these conditions, some radical changes from the present mine-cage safety catches must be made. The elevator manufacturers have practically solved this problem, but their devices are more complicated than the mining man thinks are necessary—one or more additional ropes in each shaft are required and the entire operation depends on niceties of clearance, alignment and working fits that are difficult to maintain under the severe conditions existing in mine shafts. The office-building type of passenger elevator with metal guides, speed governor, etc., has been installed as a man hoist at mines, but in only a few instances.

In commenting on these papers, H. F. Lunt, Commissioner of Mines of Colorado, said that while splicing of hoisting ropes was permitted in that state for the raising of minerals, the hoisting ropes by which men were raised must not be spliced. Mr. Howe recommended that ropes be not spliced when used in either shafts or steep slopes.

Mr. Lunt asked if any investigations had been made into electrical tests of wire roping. He understood that parts of a rope which broke in service in one of the shafts of British Columbia had been tested in this manner, the corroded and broken wires resisting the passage of the current. This seemed a possible way of testing ropes in service, for it revealed any weakening that might result from corrosion, severing of strands and reduction of area.

B. F. Tillson, general superintendent, New Jersey Zinc Co., said that he would caution his hearers against the use of an internal drum for the purpose of taking up excess rope without absorbing any part of the space provided in the hoisting drum for that purpose. He had placed such a drum on one of his hoists and found the rope was soon nicked where it passed to the hoisting drum. As a result he was never able to use the extra rope he had provided. In reference to slope rollers he said he had used a soft rubber roller between two steel flanges and had found it quite desirable. Idlers with ball bearings he had found unsuitable. They spun so persistently after the rope had passed them that they were still spinning—and in the wrong direction—when the rope returned.

In Mr. Tillson's viewpoint the factor of safety was largely a factor of ignorance. He thought we had not explored the subject thoroughly or we would be using a smaller factor. Why not find the limits of variation in strength and the limits of starting stress and all the many factors which tend to shorten and destroy the rope's life and then, having scientifically allowed for all ascertainable stresses, use a factor of safety far less large than with the rough-and-ready methods we are now obliged to adopt?

He advocated also that the speed of hoisting planes be not limited arbitrarily. He believed a greater speed should be allowed where good tracks were provided. What is over-safe speed on a good road may be an extremely unsafe speed on one that is poorly laid and maintained. Why should good equipment have a handicap placed on it equal to that placed on the poor equipment that the less progressive firms are installing?

Mr. Tillson said that he had found that head sheaves in time became fluted and argued that this action subjected the ropes passing these flutings to torsion. The torsion is greatest near the end of the rope, the twist being carried backward to that end as the rope is pulled over the head sheave. This is why it was well to have a swivel coupling at the cage.

Mr. Tillson further stated that before the war Mr. Burroughs, of the Bureau of Mines, was co-operating with the New Jersey Zinc Co. in an investigation of ropes. War conditions stopped the inquiry and after the war the condition of the industry made it advisable not to resume an inquiry that had so large an element of scientific altruism. In this investigation the ability to test ropes electrically had been considered.

Graham Bright asked if the factor of safety was based on the static stress on a straight rope or took into consideration the stresses resulting from acceleration, which might be equal to half the dead load.

Rudolph Kudlich said that the Illinois operators in speeding up their hoists had been obliged to increase the diameters of their ropes considerably. Their 5- or 6-ft. head sheaves were too small for the work required of them, lowering the actual factor of safety and shortening the rope life.

Robert Peale, professor of mining, School of Mines, Columbia University, said that, owing to the severity of the starting stress and the lack of elasticity in a short rope, the factor of safety for a rope in a short shaft should be greater than for a rope in a deep shaft. Furthermore there is the oscillation of the rope to consider, which is a more important factor where the free rope is short.

Fayette County Mining Institute Discusses Qualifications of Mine Superintendent

THE Fayette County (W. Va.) Mining Institute held its regular monthly meeting Feb. 11 in the Y. M. C. A. building at Mt. Hope. This meeting was well attended. The following officers were elected: Thomas Donelson, president; Robert J. Holmes, secretary-treasurer; Robert Lilly, first vice-president; J. F. Hindson, second vice-president; L. Pepper, third vice-president; members of Executive Board, Messrs. Albert Angus and J. S. Mason.

John Mullabone served as president of this fast-growing institution for the years 1920 and 1921, during which time he never failed to present himself at the meetings, regardless of weather conditions. He served in his official capacity with exceptional efficiency and to the entire satisfaction of all.

When taking the chair Thomas Donelson made a short address which was most favorably received. He commented upon his predecessor's record and stated that he would endeavor to maintain the standard set and keep the institute growing.

Among the subjects discussed were: What are the principal causes contributory to fires? interpretation of the latter part of Section 63 of the West Virginia Mining Law, and a system of mine inspection that would tend to prevent mine fires.

A paper presented by R. G. Poff, and read by the secretary, entitled "Co-operation Comes Through Leadership," stirred up more comment than the previous subjects mentioned. It brought out pent-up feelings concerning unsatisfactory methods of employing men ignorant of mining and placing them in the position of mine superintendent to dictate to a foreman qualified and certified as competent by the State Board of Examiners.

One short extract from this paper is as follows: "Occupations of every kind present their own peculiar problems. One bone of contention in coal mining in most cases is the fact that the superintendent is not required by law to take an examination or hold a certificate of competency, as is the foreman under him. The certification of the mine superintendent would be a step forward. Weekly visits of the superintendent throughout the mine will do more good than all the office meetings ever held and will stimulate a better working spirit."

Papers for the next regular meeting, in March, to be presented by Messrs. Angus, Ward, Roncogline, Hindson and Holmes, all will be on different subjects. A committee of five was appointed to establish a mining library in connection with the institute and to get in touch with other organizations of a similar character for the exchange of papers and pamphlets.

A friendly rivalry exists between the Fayette County Mining Institute and the Raleigh County Mining Institute for supremacy in membership. Thus far it is conceded that Fayette County has the lead, but the Raleigh County organization is making the race interesting.

J. J. FORBES, COAL-MINING ENGINEER of the Bureau of Mines, is collecting data for the preparation of a bulletin on sampling and analyses of Alabama coals. This bulletin will give information regarding the coals of the Birmingham district. One hundred and forty-nine face samples of coal have been taken in thirty-four mines in Alabama, representing fourteen different coal beds.

AT THE CENTRAL DISTRICT STATION of the Bureau of Mines, Urbana, Ill., a study has been made of the inhibiting effect of finely divided fusain or mother coal on the coking property of Illinois coal. Coking tests were made on coal containing up to 10 per cent 200-mesh mother coal without any appreciable deleterious influence being shown.

Book Reviews

More Power for America

AMERICA is full of power—fairly bursting with it. That is her only defense for the prodigal way in which she has wasted her resources and is wasting them today. Coal is going, oil is half gone, and water power, vast as are its potentialities, is not the all-sufficient bulwark the overzealous have pictured. Yet 50 per cent of the power the country produces still effects an easy escape, while the power available in the earth's crust is tapped with intolerable recklessness. But the country is beginning to realize vaguely that these things are so. That is the one relieving touch in this drab picture painted by C. G. Gilbert and J. E. Pogue in their new book, "America's Power Resources" (Century Co.).

The book is a sort of composite of the notable Smithsonian Institution pamphlets these two men of vision and deep insight published after exhaustive researches. They have written an absorbing, popular story, tracing the nation's power resources back to geologic beginnings, describing the efforts America makes to put those resources to work, the appalling losses suffered in the process and what the writers think should be done about it.

These two trained observers find that our entire energy situation is unsound. Natural gas and oil producers are compelled to pump for dear life from the time they tap until they exhaust a deposit, all unmindful of the state of demand, for unless they do so, the well adjoining will suck out all the riches under their feet. Oil properties should be developed by whole regions, the authors believe; not by small units. The same sort of integration in soft-coal mining would be of vast benefit. With a broad basic plan to work on, the operators of mines would not merely take the "easy" coal, leaving half the deposit untouched and useless to mankind. Government restraint, the authors note, has prevented beneficial big-scale development such as has marked the progress of every other truly American industry. The authors hope, with Senator Kenyon, that coal will some day come to be regarded as a public utility, removed from the realm of destructive competition, and be subject to public oversight, thus gaining the advantage of co-operation and integration with the dangers of monopoly safeguarded by "proper governmental regulation."

They hold the theory that integrated coal mining under proper limitations will reduce waste both of coal and of the human element, stabilize production, adjust supply and demand, lessen transportation and hold the centers of coal production longer in their present spots, to the advantage of existing distribution of industrial activities. However, it cannot be expected to lower coal prices to the consumer, they explain. To effect that, far-reaching changes in coal utilization alone will meet the situation. The familiar George Otis Smith chart illustrating the fact that 1,924 pounds of coal out of each ton is wasted during conversion into mechanical energy is evidence that there is pressing need for such changes.

The new deal which the authors envision for the mining and consumption of coal would save, they calculate, more than a billion dollars a year in needless mining and transportation, besides adding to the value of products recovered from coal $280,000,000 in nitrogen, $300,000,000 in benzol and $100,000,000 in products made from benzol and tar. These figures add up neatly to the stupendous total of about two billion dollars, which might be applied annually to reduce America's cost of living about $20 per capita.

America must be roused to the necessity of extracting—and using—these byproducts down to the last pound. She must realize that anthracite—always a luxury because its mining and transportation costs are high—cannot hold its own as a chief domestic fuel, but that "artificial anthracite" can largely take its place.

The ideal condition, as the authors see it, is for all of a community's bituminous coal to be purchased and consumed on a centralized basis at city gas plants converted into modified byproduct plants and with a centralized distribution of all the products—gas, ammonia, benzol, tar, and "artificial anthracite," a non-cellular carbonized product more easily controlled and more satisfactory all around than coke for house fuel.

"It is not beyond the bounds of reason," say the authors, "to foresee a condition whereby a householder, in place of his ton of anthracite which he now welcomes for $11 ($14 now), will receive a ton of smokeless coal without slate, a month's supply of cooking gas, forty miles of motor fuel, enough fertilizer to start a small garden and tar sufficient to allay the dust in front of his house—all for less money than he now pays for inferior coal."

When the 500,000,000 tons of coal now improperly utilized each year are made to yield up their all, when vast quantities of coal are converted at the mines into electrical energy, when the railroads are relieved of a congesting volume of raw fuel freight, when national sentimentalism and high interest rates on hydro-electric investments cease to hamper water-power development and when the government sweetens its "spirit of blind antagonism" toward co-ordination in industry, then, the authors believe, the nation will make full and happy use of its unparalleled fuel resources.

F. R. Wadleigh's Coal Manual

FOR a mixture of elementary and advanced coal lore the beginner can do no better in the present state of our literature than turn to Wadleigh's "Coal Manual" (National Coal Mining News, Cincinnati). From a preliminary dissertation on coal and civilization the author (who, by the way, writes from a personal knowledge of many years in many lands in nearly every contact with coal, from firing a locomotive to directing the foreign sales policy of a coal exporting house) takes us through the intricacies of coal sampling, analysis, and purchase on specification, to the practical theme of efficient use.

To those who seek the elemental facts about coal as coal this booklet is recommended; some of the older hands in the business can learn from Mr. Wadleigh's chapters on use of coal. To those who may acquire this book we hasten to add that the contents are even more promising than the book in which they are found.

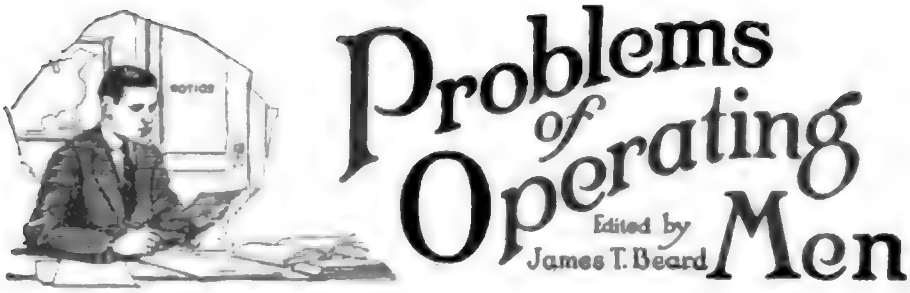
Lifting the Mystery of Briquetting

MUCH of the "mystery" of coal briquetting is torn away by the authors of the Mashek Engineering Co.'s Catalog No. 5, which covers the subject of coal briquetting, machinery and plants in a straightforward, clear manner. The first 56 pages of this handsome book are of a character to warrant designation as an engineering report or a text book on the theory, history and practice of briquetting, besides containing data on the size and cost of plants and of the manufacture of fuel briquets.

Particularly interesting is the chapter on binders, in which the merits of each known substance suitable for binding coal particles into solid fuel are fully set forth.

Significant at this time—because of the work now being done by the Bureau of Mines—is the comment on briquetting of lignite. It is stated that the "problem of converting practically any low-ash lignite into a fuel equal to Pennsylvania anthracite in heating value has been solved."

AT THE PITTSBURGH STATION of the U. S. Bureau of Mines a series of tests has been made to determine the relative steaming values of coke as compared to anthracite and bituminous coal when fired by hand into a large low-pressure boiler suitable for heating a large building. The results are now being compiled. Many special temperatures were read and samples of gases analyzed to explain the variation in efficiency in burning these fuels.



Problems of Operating Men

Edited by James T. Beard

Mixing Salt With the Stemming, in Blasting

Salt Used With Good Effect in Arkansas Mine—Two Methods of Distribution Employed—Dummy of Salt Placed in Hole Next to Charge—Tests Show Dust So Damp as to Be Plastic

HAVING had some five years experience in the use of salt as a medium for collecting moisture from the mine air and thus dampening the dust that collects on the gob and in the roadways, in mines, I was deeply interested when reading the inquiry of "Engineer," *Coal Age*, Jan. 26, p. 172.

The mine in which we have been using salt for this purpose is located in Sebastian County, Arkansas, where we are mining what is known as the "Hartshorne seam." This coal approximates very closely, in analysis, to the Pocahontas coal of West Virginia.

The mine is considered a very dry and dusty mine. All the coal mined is shot off the solid, with black powder, except in a few instances only, where permissible powder is used.

In the early part of 1917, two explosions occurred in this mine, both of which were caused by windy shots. In each case, the explosion was propagated very widely, throughout the mine workings, by the coal dust that filled the roads and waste places in the mine.

At the present time, we occasionally have windy shots occur, in blasting the coal; but no propagation of the explosion now results. We feel that this fact is due, in a very large measure, to the practice we have adopted of using salt to dampen the dust, in the manner that I will describe.

HOW SALT IS USED AND DISTRIBUTED

The grade of salt used is that known as "No. 4." It is bought in carload lots and shipped to the mine where it is sacked in most any kind of sacks. For convenience of handling, however, it has been found that the sacks should contain about 100 or 150 lb. of the salt.

At one time, we adopted the method of loading the salt directly into a mine car and scattering it along the entries and in old rooms, by means of shovels. Particular attention was given to scattering the salt around the partings, where coal falling from the cars produced an excessive amount of dust.

While we found that the salt scattered in this way would collect the moisture from the air and keep the dust damp, the method proved ineffective to some extent, because there were often wide spaces where there was no salt, and the dust that collected in such places was a menace to safety.

Later, the plan was suggested of using the salt as a part of the stemming when tamping holes, in blasting, as mentioned in the inquiry to which I referred. This method has since proved so effective for scattering the salt, in old abandoned rooms where it is impossible to sprinkle with water without laying pipe lines, the plan is still in use.

So effective has the method of distribution proved, not only in scattering the salt in the gobs, but on the ribs and timbers on the roadways, that it is now the regular custom to supply each miner with a bag of salt, which he keeps at his tool box where he makes up his dummies and powder cartridges.

SALT DUMMY NEXT TO POWDER

The regulations in this mine, now require each miner to make one dummy of salt, which is about 12 in. long and 2½ to 2¾ in. in diameter, that being the size of the augers used there. This salt dummy will contain from three to four pounds of powdered salt and, as each miner shoots from three to four holes a day, there is scattered in his working place from nine to sixteen pounds of salt each shift.

The salt dummy is placed next to the powder cartridge where it is found to have a maximum effect in preventing the projection of flame from the hole when the blast was fired. We believe that the salt does have this effect on the flame that would otherwise be produced, but are unable to state this as a fact. I want to endorse the suggestion already made, in the reply to this inquiry, that the Bureau of Mines make an investigation to determine if the salt has an extinctive effect on the flame of a shot, in blasting coal.

TESTS MADE TO PROVE SUCCESS

Several tests have been made, at our mines, to prove the efficiency of this use of salt. For example, in making such a test, a room was selected that had been driven in from 50 to 100 ft. from the entry, without the use of salt. At this point, salt was introduced and made part of the stemming of each shot fired in the place, after the manner I have described.

The result was watched with interest and it was found that, within three or four days, a slight dampness on the gob and ribs was noticed. Again, in from ten to fifteen days, the dust became so damp that it could be wadded up in the hand and would retain its shape. This dampness was noticed everywhere in the gob and on the ribs and timbers of the place. It was also observed to extend, to some extent, into adjacent rooms where no salt had been used.

By the use of salt, in this manner, we have been able to dispense with sprinkling in some parts of the mine where is was formerly necessary to wet down the ribs and gob with water. We believe that these results warrant a much wider use of salt than now prevails in dry and dusty mines.

Huntington, Ark. SUPERINTENDENT

Another Letter

FROM the reading of the inquiry presented by "Engineer," *Coal Age*, Jan. 26, p. 172, it would seem that he is seeking for a method of reducing the flame of blasting to a minimum and wants to find out if salt is effective for that purpose.

Such a use of salt is new to me, as I have never seen it used when tamping a shot. We are all familiar with the use of calcium chloride, or salt, for the purpose of dampening the dust on the haulage roads, in dry and dusty mines. This practice was in use at the Gallatin mine of the Pittsburgh Coal Co., at Monongahela City, Pa., where I worked. In that mine it was found that either salt or calcium chloride gave better results than came from the use of water, for sprinkling the roads The dust was kept in a moist or damp condition, by reason of the water absorbed from the air by these chemical salts.

DOES MINE LAW FORBID USE OF SALT?

In regard to the use of salt in stemming when blasting coal, it occurs to me that the mine law would not permit of such practice I am not familiar with the law in Illinois; but the bituminous law of Pennsylvania states plainly that the hole must be tamped with clay or other incombustible material

In my judgment, where nothing but permissible explosive is used and all shots are examined, charged and fired by shotfirers, there is little need of using other material for tamping a hole than the clay I have mentioned.

My experience is that where shots are fired, in compliance with the law in Pennsylvania, little flame is produced by the blast and what is follows the cracks or crevices in the coal where it is broken loose by the force of the shot and its heat thus dissipated.

If coal dust is used in tamping a shot I can readily believe that, either calcium chloride or salt mixed with the dust, would have a beneficial effect in quenching the flame that would follow the firing of the shot. On the other hand, when stemming a hole with clay it does not seem to me that the salt would have any effect, unless the shot blew the tamping from the hole.

In answer to this inquiry, my advice is to use the salt for dampening the dust accumulated in a working place where shots are fired. Then, tamp every hole with incombustible material and use only permissible powder.

Mayport, Pa. JAMES THOMPSON.

Spiral-Separator Plant

Spiral separators now in use in many coal-producing states and in Canada —Tests made of samples of the coal before installation — Occasionally a coal is found requiring other treatment.

MY attention has but recently been called to the article of Benedict Shubart, of Denver, Colo., which was originally read at the June meeting of the Rocky Mountain Coal Mining Institute and reproduced in *Coal Age*, Oct. 20, 1921, p. 631, treating incidentally on the separation of coal from its impurities.

While Mr. Shubart has not expressed his opinion regarding spiral separation fully or specifically, he says he questions the commercial success of such an installation. We naturally desire to refute this statement with a brief reference to our experience in the bituminous coal field.

On page 633 of his article, Mr. Shubart says, "A number of devices are in use for automatically cleaning the mine product, but so far none has been found practical under existing conditions. One mine is now preparing to spiralize its coal. Spiralizing demands the separation of the material treated into a large number of even-sized fractions. Furthermore, the coal must be even texture and substantially dry. I question the commercial success of this installation."

Spiral Separators in Use

In the first place, allow me to state, for the benefit of many who are interested in the economical separation of coal in its preparation for market, that we have supplied Spiral Separators to companies in Alberta, Canada, New Mexico, Alabama, Illinois and many other places.

As is the case with all coal separators, we occasionally find a coal that we cannot handle. For this reason we request samples to be sent us, so that we can inform the companies of the results that can be obtained with spirals.

In the last few months, we have tested over a dozen samples of bituminous coal from England; and in nearly every case have obtained a good separation. We have since received over two dozen samples sent by companies from all over the bituminous coal fields of England. At each of these collieries, there are several different veins of coal.

Regarding the commercial success of spiral separators, we take pleasure in quoting the following letter, which proves more than anything we could say:

OLD BEN COAL CORPORATION
McCormick Building
CHICAGO, ILL., May 2, 1919.

Mr. F. H. Blatch, Supt.,
Anthracite Separator Co.,
Hazleton, Pa.

DEAR SIR:

We are very glad to give you the following data concerning our experience with your separators, citing the instance of our No. 9 Plant at West Frankfort, Franklin County, Illinois.

Our No. 9 Mine Spiral Preparation Plant, which is equipped with sixty Anthracite Separator Co.'s spiral separators, handles sixty per cent of 5,000 tons, normal capacity of the mine, or 3,000 tons in eight hours. This is at the rate of 6.25 tons per hour, per spiral, which could be considerably increased without detriment to quality of preparation.

The plant is operated by one foreman and ten men, not including the men loading out coal on the tracks. Of these men two are easily able to attend the spirals, the others taking care of the screens, conveyors, motors, etc.

The results are entirely satisfactory as impurities are removed more thoroughly than by washing, without the drawbacks incident to the latter process. Our preparation is made entirely over dry spirals.

Five sizes are prepared, ranging from 6x3 furnace down to ¾x½ pea coal.

We can positively state that we know of no method of preparation of coal that we would consider as even approaching spiral separation, for our purposes.

OLD BEN COAL CORPORATION,
D. W. BUCHANAN, President.

We would also like to add that the spiral separator can be run either wet or dry. F. PARDEE, JR.,

Manager, Anthracite Separator Co.
Hazleton, Pa.

Theory of Coal Formation

In situ theory of coal formation disputed—Facts cited in support of coal being formed under sea water.

MY ATTENTION has but only now been directed to an article that appeared in the issue of *Coal Age* for January 5 (page 8), on the deposition of coal beds in sea waters. The article is written by H. W. Hixon and interested me particularly, being written in support of a theory I have always regarded as more probable than either the *in situ* or the "drift" theory of coal formation.

It was about twenty-five years ago that the *Engineering and Mining Journal*, then edited by R. P. Rothwell, published an article of mine, presenting the same hypothesis as that set forth in this article to which I have just referred. In the previous article, I pointed out the absurdity of assuming that our coal beds were the only exception to the general rule of Paleozoic strata being invariably ocean deposits.

Permit me to cite a few instances in support of the theory that the coal formations are, in reality, ocean deposits resulting from the action of immense deltas, in former ages. The facts I am about to mention are the results of my own observation.

In the No.-2 gas bed, at Powellton, W. Va., I found a petrified lepidodendron, about 18 in. in diameter, standing nearly vertical. This specimen was unflattened and rooted in a 50-ft. conglomerated sandstone. It passed upward through 3 ft. of slate forming the floor of the coal bed; then, through 6 ft. of coal, including a 4-in. slate parting near the middle of the seam. Continuing upward, the specimen I am describing passed through 2 ft. of slate roof, into a 40-ft. overlying ledge of sandstone.

The tree had evidently been anchored by a heavy root and the strata, in the order named, deposited around the trunk, by the ocean water acting as a jigger. More than 6 ft. of this lepidodendron was taken out and stood in front of my office, where I left it in 1890.

Evidence Disproves Other Theories

To my mind, this is alone sufficient to refute the accepted inland-lake theory of the formation of coal. However, to further substantiate the idea that our coal beds are ocean deposits, about 1917 I found a piece of tide-worn crystalline quartz, about the size and shape of an ostrich egg. This specimen was found in the center of a small bed of coal in Fayette County, West Virginia. The smooth rounded form of this specimen could only have resulted from wave action. There was no disturbance in the sedimentation of the coal roof or floor, and the rounded pebble must have been carried, by the rushing torrents of the delta, out to the deeper waters beyond, where it was deposited.

Dr. White of the Geological Survey, informs me that he has placed this specimen in the Smithsonian Museum under my name. Another specimen collected in my rambles is a coral, about 1¼-in. in length, taken from a local thickening of a sandstone parting, in the No.-2 gas bed, at Ansted, W. Va.

In my previous article, published in *Engineering and Mining Journal*, I assumed that, in Paleozoic times when the North American continent was submerged, there existed a large tropical continent, which is now submerged and of which Central America and the West Indies are remnants.

Humid Climate of Early Ages

The climate, in those ages, was more humid than our present climate; and it is probable that rivers much larger than the Mississippi or the Amazon discharged enormous quantities of tropical vegetation northward into the ocean, where it remained afloat until its specific gravity exceeded that of the water. In that condition, it would be jiggered into position, by river or ocean currents, and deposited in the same manner as the shales and sandstones.

Again, Dana refers to a species of spider found, in the coal beds, at the 85th parallel. He states positively that the spider could not live in any temperature below 66 deg. F., making it probable that this spider was transported there, from the tropics, by ocean currents.

Discounting this idea of transportation of the spider, we must assume that the axis of the earth has changed since Azoic times, or near the end of Paleozoic times. There is no other alternative if we accept Dana's statement that the spider could not live at a lower temperature than that named. We assume, of course, that the sun was the source of heat, then, as now. That being true, a minimum temperature of 66 deg., on the 85th parallel, would require more than 212 deg. F. at the equator. **W. N. Page.**

Washington, D. C.

What Constitutes a Solid Shot?

Solid shot determined by line of least resistance approaching axis of hole—Loose-end shot may be solid when charge is too far away from that end.

THERE seems to be considerable doubt, in the minds of some writers, as to what constitutes a "solid shot." In his letter, *Coal Age*, Dec. 22, p. 1016, Edward H. Coxe appears to hold the opinion that a shot properly mined, or a loose-end shot cannot be called a "solid shot."

On the other hand, according to his statement, some mine inspectors and insurance inspectors, in Pennsylvania, hold to the opinion that a loose-end shot is a shot off the solid. Now, in my humble opinion, a shot on a loose end, or one that has been mined or sidecut, may still be a solid shot.

SOLID SHOOTING DEPENDS ON THE POSITION OF CHARGE

To make my meaning clear, let me say that the question of a shot being "solid" depends wholly on the position of the charge and the line of least resistance. If the line of least resistance corresponds more or less closely to the axis of the hole I consider such a shot a solid shot.

For example, when shooting a loose end a greedy miner may drill a 6-ft. hole, at a distance of, say from 7 to 12 ft. away from the loose end. Or, where the shot is mined or sidecut, the same miner may locate his charge too far from the mining or shearing.

In either case, the distance from the charge to the face of the coal is shorter than the distance to the loose end, or to the back of the cutting. The result is, as every practical miner will agree, the shot will blow its tamping; or, perhaps, it will blow out a funnel-shaped hole in that direction.

To my mind, the Bituminous Mine Law of Pennsylvania, defining blasting should prescribe that *the line of least resistance shall not be in the direction of the drillhole; but make a substantial angle with the axis of that hole*, in order to insure the coal being broken down without danger of the shot blowing its tamping.

In other words, the reading of the law should make it plain that the distance from the charge to the loose end or back of the mining or cutting must always be a considerable less than the depth of the hole.

My idea is that a drillhole should never be farther from the shearing than the depth of that cut; and the hole should never be pointed away from the cutting but inclined toward it. In shooting a loose end, the distance from the back of the hole to the end of the coal should be considerably less than the depth of the hole.

It has always been my practice to never grip a shot when shooting a loose end, but drill the hole to a depth greater than its distance from the end of the coal and in a direction about at right angles to the face of the coal.

Fredrickstown, Pa. **James F. Gamille.**

Inquiries Of General Interest

Power to Drive Fan at Constant Speed When Mine Resistance Is Increased

Fan Driven by Electric Motor at Constant Speed—Less Power Consumed as Mine Resistance is Increased—Power Remaining Constant, Fan Will Run Faster, Under the Same Conditions

KINDLY answer, in the columns of *Coal Age*, the following questions regarding which different opinions have been expressed by two prominent mine foremen, each of whom are equally well versed on mining matters. The question can be stated as follows:

Assume the air-courses in a mine are 1,000 ft. in length, from the intake to the discharge opening. The mine is operated by a fan driven by an electric motor, and it is desired to maintain a constant speed of the motor and the fan.

Now, assuming that the length of the air-courses has increased, in the development of the mine, from 1,000 ft. to 5,000 in length, the question is, Will more or less power be required, in that case, to operate the fan at the same speed as before? As far as the question of power is concerned, the quantity of air circulated in the mine is immaterial. The point in dispute is, Will the increased development of the mine require more or less power, in order to operate the fan at the same speed as before?

In debating this question, we will say, a Pennsylvania mine foreman claims that to maintain the same speed of the fan under the increased development of the mine will require a greater power. On the other hand, let us say a West Virginia mine foreman maintains that the power required to operate the fan at the same speed will be less and less as the development of the mine is increased. Which of these gentlemen has the right understanding; for I must confess it is beyond my knowledge. **Referee.**

————————, Pa.

This question has been a frequent subject of debate, in mining circles, and one in which the opponents often require that a practical test be made, before either of them will be convinced. It is similar to the question of whether the setting open of a mine door dividing the main intake and return airways, at the bottom of a shaft, will cause the fan to run faster or slower, under the same power; or, maintaining the speed of the fan constant, will more or less power be consumed?

The answer to this question is that the setting open of a main door, at the shaft bottom, short circuits the air at that point and cuts off the mine resistance, which has the effect to cause an increased flow of air through the fan. The result is that a larger amount of work is absorbed and lost within the fan, and less power is therefore available for turning the fan, which will run slower, under the decreased resistance of the mine.

The reverse of this is also true; namely, the fan will run faster as the mine resistance is increased, assuming that the power remains constant.

On the other hand, to maintain a constant speed of the fan when the door is set open at the bottom of the shaft will require an increase of power. In other words, more power is required to operate a fan at the same speed, under a decreased mine resistance; and less power will be required to produce that speed under an increased resistance to the flow of air through the mine.

Now, applying these facts to the solution of the question under debate, as has been stated the quantity of air in circulation is immaterial, as far as the question of power consumed is concerned. The development of a mine increases the mine potential, which is its resisting power, and, here also, for a constant speed of the fan, the power consumed will be less as the development of the mine is increased. Therefore, we give our verdict in favor of the West Virginia foreman.

Examination Questions Answered

Alabama First-Class Examination Birmingham, Jan. 23-26, 1922

(Selected Questions)

Question — *What qualifications are necessary to make a successful mine foreman, other than those required by law?*

Answer—The successful mine foreman must be a good judge of human nature and be able to handle men in a manner that will secure their good will and hold their respect for his authority in the mine. His practical experience must be such that will enable him to judge correctly what constitutes a day's work and to know when work is well performed. He must give his entire attention to the supervision of the mine and maintain a constant daily output of coal, at a minimum cost.

Question—*What is the object to be attained by requiring the mine foreman to visit the working places every day when the men are at work?*

Answer — By visiting each working place every day when the men are at work, the foreman will keep himself informed regarding the safe condition of the mine and the manner in which the men perform their work. He will be better able to judge of the future requirements of the mine and know what supplies are needed, and whether these are being wasted or used to best advantage. Better discipline is maintained in a mine where the foreman is continually in touch with his men.

Question — *What is the principal object of ventilation in coal mines? Should there be as much air, per man, in a non-gaseous mine, as is generally required in a gaseous mine?*

Answer—The chief object of ventilation is to keep the mine in a safe and sanitary condition, by sweeping away the gases that would otherwise accumulate in the workings, and furnishing pure air for the men. A mine generating gas in appreciable quantity will generally require more air, per man, than a mine that is free from gas. Most mining laws require from 50 to 100 per cent more air, in the ventilation of a gaseous mine, than what is required in other mines.

The matter of chief importance, however, is the velocity of the air current at the working faces, which must be such as to sweep away the gas generated. To produce this velocity, a somewhat less quantity of air must be circulated in a thin seam than where the coal is thicker. On this account, the quantity of air, per man, is not the determining factor in every case. Also, the number of men employed being greater in some mines than in others, that must be taken into account when deciding on the volume of air required to make a mine healthy and safe.

Question—*Is it proof of good ventilation, in a gaseous mine, when a very rapid current of air is passing through a small airway? Give reasons.*

Answer—A rapid air current, in a contracted airway, is no sign that the mine is well ventilated. The quantity of air in circulation is determined by the product of the velocity of the air current and the sectional area of the airway. Good ventilation requires that a sufficient air volume is entering the mine and that this air is conducted in sufficient quantity to the working faces. The entire volume of air must be divided between the several districts of the mine, so that the desired quantity, per man, will be furnished in each district at a moderate velocity.

Question—*State why, in your opinion, the pressure or water gage increases as the workings are extended, other conditions remaining the same?*

Answer—As the workings of a mine are extended, the rubbing surface is increased, which increases the frictional resistance of the mine and the pressure or water gage required to circulate the air. Both the pressure and the water gage are determined by the velocity of the air current and the amount of rubbing surface, per square foot of sectional area.

Question—*If it becomes necessary to stop a fan for repairs, how will you keep the mine clear of gas in the meantime? What precautions should be taken before stopping the fan?*

Answer — A mine ventilating fan should never be stopped and the men permitted to continue at work in their places. In case of a sudden breakdown of the fan, all the men should be promptly withdrawn from the mine and not permitted to return to work, until after the repairs have been made and the mine has been examined and reported to be safe for work.

In a small drift mine ventilated by an air shaft on the hill, it may happen that there will be a considerable natural ventilation provided by the air column in the shaft, after the ventilating fan has ceased to operate. Even in that case, however, it will not be safe to permit the men to remain in the mine when the fan is not in operation. The fact that a fan is required to properly ventilate the mine shows the need of withdrawing the men if the fan, for any reason, is stopped.

Question—*In a mine working 312 miners, 49 daymen and 22 mules, how many cubic feet of air, per minute, does the Alabama mining law require in circulation?*

Answer—There are, in this case, 312 + 49 = 361 men and 22 mules, at work in the mine. The mining law of Alabama requires a circulation of 100 cu.ft. per min., per man, and 500 cu.ft. per min., for each mule in the mine, making the required air volume, in this case, 361 × 100 + 22 × 500 = 47,100 cu.ft. per min.

Question—*What are the dangers attending the presence of an excessive amount of fine coal dust in a mine and what remedies should be employed to lessen the danger of its presence?*

Answer — Danger arises from the fine coal dust being blown into the air, in blasting; or raised and carried in suspension in the air current, by the various operations performed in the mine. The presence of the dust renders the air explosive when ignited by a flame of sufficient volume and intensity.

In order to lessen this danger, no accumulations of dust must be permitted at the working faces and on the roadways or traveling ways. To prevent the dust from being thrown into the air an efficient sprinkling system has been installed in many mines. Also, the use of salt, on the roads and other passageways, has been found of advantage in keeping the dust in a damp condition. In some mines where the coal is blasted, salt has been mixed with the stemming, in tamping the holes, and this has been found an effective means of distributing the salt at the working face when the shots are fired. A good method is to make a dummy of salt and place this next to the charge of powder when charging the hole. The hole is then tamped with clay or other incombustible material. It is claimed, also, that the salt has an extinctive effect on the flame of the shot.

Question—*What precaution should be taken in entering an abandoned mine?*

Answer—When entering such a mine extraordinary care should be used to detect any gas that may be present. An open light should not be used; either an electric cap lamp or an approved safety lamp should be employed. One should proceed slowly and watch carefully for any possible effect that may be produced on the system, by breathing the air in the mine. On first observing any weakness or difficulty in breathing, one should always withdraw promptly to fresh air. It is always wise to carry, on such occasions, caged mice or birds that will give warning of the presence of carbon monoxide in the air. If this is not done, frequent tests should be made with a proper gas detector designed for that purpose.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

ON the whole, the figures received by the Department of Commerce in its "Survey of Current Business" during the two weeks ended March 3 further emphasize the progress which business has made, compared with six months or a year ago. Nearly every industry shows slow and steady improvement and returning confidence.

The increase in the price of farm products is having a far-reaching effect upon industry in general. Current reports reaching the Department of Commerce indicate that the trade of mail-order houses and of other distributors, largely dependent upon rural patronage, is already feeling this improvement.

In the textile industry figures previously reported showed that both cotton and silk consumption increased in January, compared to the preceding month. Wool consumption, however, the figures for which have just become available, shows a decrease from 64,200,000 to 61,973,000 lb. in January; nevertheless, this figure is still more than double the consumption in January last year.

Exports of iron and steel in January amounted to 157,000 tons, the largest since April of last year. Exports of copper totaled 53,130,000 lb., which was a decrease of over 8,000,000 lb. from December. Imports of tin increased to 8,103,000 lb., larger than for any month of 1921.

Exports of both bituminous and anthracite coal declined. Bituminous exports, at 644,000 tons, were only a little more than one-fourth as large as a year ago.

Petroleum production in January reached a new high level of 43,326,000 barrels, which, accompanied by heavy imports and decreased consumption, brought the amount in storage to 195,444,000 barrels, the largest so far recorded for any month.

Newsprint-paper production declined slightly in January, but, with the exception of December, is the largest for any month since April, 1921. Exports of newsprint increased nearly 60 per cent, reaching a total of 5,073,000 lb., and exceeding any month in 1921.

Contracts awarded for business and industrial buildings increased over December, both in floor space and in value. All other classes of building showed a slight seasonal decline. Residential buildings contracted for in January total 18,083,000 sq.ft., valued at $75,728,000. This is by far the largest amount of residential building ever recorded for January. Indications point to a big increase in building operations this spring.

Practically every lumber association reports an increase in production over December. A portion of this increase is seasonal, but, compared with January last year, there is a very marked increase.

Exports of wheat, including flour as grain, amounted to 14,985,000 bushels in January, which is a further decline from preceding months. Exports of corn and corn meal, on the other hand, increased 9,000,000 bushels over December, reaching a total of 19,437,000 bushels.

With the exception of farm products, price index numbers showed a tendency toward lower values in January. In most groups this was limited to one or two points. The Department of Labor's wholesale index for all commodities dropped from 149 to 148 in January.

Due to the heavy drop in retail food prices the cost of living index, compiled by the National Industrial Conference Board, declined to 158, compared with 161 in December and the high point of 205 reached in July, 1920.

Freight Loadings Recede Slightly

Cars loaded with revenue freight during the week ended Feb. 18 totaled 780,924, compared with 788,412 during the previous week, or a reduction of 7,488 cars, according to the American Railway Association. Observance of Lincoln's birthday was no doubt a contributing cause to the decreased loading. The total for the week was, however, an increase of 88,917 cars compared with the corresponding week last year and 8,822 cars above that for the corresponding week in 1920. Coal loadings totaled 190,700 cars, 1,467 less than the previous week. This was, however, 43,296 in excess of the same week in 1921 and 19,292 greater than the total for the corresponding week in 1920.

Unemployment Falls in Cleveland

Industrial employment in Cleveland continues to improve. The Cleveland Chamber of Commerce Committee on Labor Relations in its latest monthly survey shows that men are going back to work in nearly all of the city's largest industries. The numbers employed are the greatest they have been since last May and very little smaller than they were during February, March and April. One hundred of the city's leading factories which normally employ 500 or more, reported 73,158 persons on their payrolls Feb. 28, as compared with 69,352 on Jan. 31.

Cadillac Plant Speeds Up

Orders from all parts of the country for Cadillac cars are being received in such volume that it has been necessary to increase the working force at the company's factory to a total of 7,000, very near the high water mark for this division of General Motors. Officers of the company announce that the organization is now on the largest production schedule in its history, greater by 20 per cent than is usual at this time of the year.

Steel Workers Return to Work

Several hundreds of idle steel workers returned to work last week with increased operations in the steel mills of the Youngstown district. The Trumbull Steel Co., of Warren, resumed operations on a 100 per cent basis, the first mill in the district to reach capacity since the depression began. Open-hearth steel products have reached more than two-thirds of capacity, with the Carnegie Steel Co., a Corporation plant, operating fourteen of its fifteen furnaces.

D. L. & W. Places Repair Order

The Delaware, Lackawanna & Western R.R. has placed an order for the repair of 500 cars with the Berwick Car Works, Berwick, Pa.

German Mines Now Produce Nearly as Much Coal as Before the War

GERMANY'S coal year 1921 was a strained one. Bituminous production during the first ten months surpassed that of 1920 by 5,000,000 tons and brown coal output during the same period exceeded that of the previous year by 10,000,000 tons, thus putting the country back practically on a pre-war basis, but production is not the country's big problem. The impending division of the Upper Silesion fields worries Germany because she fears she may lose a valuable fuel source. That is one difficulty. Another is the question whether German coal rates are to be raised to stop "giving" France and Belgium vast sums each month in low coal charges. Last is the question: How soon is the Entente coal tribute to be lowered? All these harassments worry the German coal industry as it moves into 1922, a year of uncertainty.

Total output during 1921 was: Bituminous coal, 136,209,000 metric tons and lignite, 123,000,000. The Ruhr district produced 94,115,000 tons of bituminous coal; Upper Silesia, 29,644,000 and all other districts, 12,450,000 tons.

The changes in output since 1913 may be seen in the following figures, from which the production of Alsace-Lorraine and the Saar mines is deducted.

COAL PRODUCED IN GERMANY, 1913-1921

1913	174,090,000 tons	1918	158,630,000 tons
1914	149,250,000 tons	1919	107,529,000 tons
1915	137,157,000 tons	1920	131,340,000 tons
1916	146,865,000 tons	1921	136,210,000 tons
1917	155,160,000 tons		

Production in 1921 was still below that of the war years, with the exception, perhaps, of 1915. The increase since 1920, although in itself not very important, shows decided progress, as the extra shifts which were run in 1920 during ten months came to an end in the middle of March, 1921. On the other hand, the early parts of 1920 were marked by several large strikes and riots, which caused a loss estimated at 4,000,000 tons.

Improved conditions are most pronounced in the Ruhr district. The total production of this district in 1921 was only 20,000,000 tons behind that of the record production of 1913, while the total of the whole of Germany fell short of the latter by 40,000,000 tons, after making allowance for the loss of the Saar district and Alsace-Lorraine.

Output Augmented by Increase in Workmen

The gain in output is largely due to the increased number of workmen. In the Ruhr district 560,000 workmen were employed at the end of 1921, compared with 533,000 at the end of 1920, showing an increase of 27,000, the larger number of which were employed on the surface. The reduction of the working time from 8½ to 7 hours is chiefly responsible for the fact that the increase of unproductive labor is higher than that of the men working below.

Production in Upper Silesia in 1921 fell short of the preceding year by 2,000,000 tons. In the main this was due to the riots which took place in connection with the plebiscite. Despite the large increase of men employed, production was nearly by 26 per cent below that of 1913. Progress, however, is noticeable compared with 1919, when the total production of Upper Silesia was 26,000,000 tons.

Lignite output in 1921 totaled 123,000,000 tons, or 11,000,000 tons more than during the preceding year. Since 1913 production has increased 36,000,000 tons.

The production of coke in 1921 was 28,000,000 tons, compared with 25,000,000 in 1920 and 32,600,000 in 1913. Of briquets of bituminous coal 5,900,000 tons, and of lignite 28,000,000 tons were produced.

In the supply of fuel a certain stringency is again noticeable, due to increased industrial activity. This is most pronounced in the case of the higher grades, caused by the sharp differentiation now exercised by industry as well as by the reparations coal. The mines are not making sufficient provision for changed conditions although urged to do so by the government as well as the market.

Attempts to raise the coal production by opening new shafts were peculiarly absent during 1921, as in previous years. A start in this respect was only lately made by the Thyssen combine, which has commenced operations for the sinking of several new pits, three of them with double shafts and two with single shafts. As a whole, opinion as to whether new shafts are profitable is strongly divided, the majority of mining concerns maintaining that productiveness is quite out of the question, as the cost of a double shaft plant, including the necessary workmen's dwellings, is over 200,000,000 M.

The countries drawing on the Upper Silesian coal production are Austria, Poland, Czecho-Slovakia, Italy and Hungary. By the division of Upper Silesia, of the 61 mines in existence, 49½ mines fall to the share of Poland, while 11½ remain German. The Polish mines yield 77.5 per cent of the total production, while only 7,000,000 tons per year, or 22.5 per cent are produced by the German section. If Germany is unable to come to an agreement with Poland with regard to the production of the lost Upper Silesian mines, she will sustain a loss of 6,000,000 tons per year.

While during the last six months the usual hue and cry directed against the coal tribute under the Spa treaty was nearly silenced, owing to eased conditions, it is again becoming a topic of the day. Monthly shipments of coal under the Spa treaty averaged 1,500,000 tons of bituminous coal and 100,000 tons of brown coal briquets. The increased activity of the industry having produced a certain stringency in the coal situation, the government is again urged to take steps to have the coal tribute reduced.

The loss of the greater part of the Upper Silesian mines is providing a further argument for this movement. Men like Stinnes believe the only remedy is to raise the domestic coal price to the level of foreign prices. He figured out that from 200,000,000 to 240,000,000 gold marks are simply given away to France and Belgium by keeping the domestic price so far below the world market standard. The damage sustained by Germany, he says, is much larger, however, as the cheap German coal puts the iron industry in France and Belgium in a position to outrival the German iron industry in foreign countries.

Government Reluctant to Raise Prices

The government, however, is by no means willing to raise prices in view of the enormous effects a rapid increase would have on the price of all other commodities. Prices have recently been raised 40 per cent to 50 per cent in the case of bituminous coal, and 30 per cent for brown coal, and the tendency is not to go further without pressing reasons. This is evidenced by the abandonment of the contemplated increase of the coal tax to 40 per cent.

In the course of this year exports of coal have increased from month to month, reaching in September 650,000 tons, or 25 per cent of the pre-war average. The imports in September were 120,000 tons, or 15 per cent of the pre-war average. These imports are chiefly bunker coal for harbor towns, and hardly penetrate into the interior of the country.

The general opinion with regard to the coal situation in Germany after the part detachment of Upper Silesia, is that in times of slack business the home production is just sufficient for the requirements of the country, while during times of increased industrial activity even under normal business conditions, it falls short. If production cannot be increased, exports of coal, even reduced as they now are, cannot be maintained. An increase of imports, however, is becoming more and more probable.

Coal-Mining Corporations to the number of 1,581 which reported a net income for the calendar year of 1919 had an invested capital of $1,175,891,538. Their net income was $98,912,336, or 8.41 per cent. They paid income tax amounting to $8,390,535 and war profits and excess profits tax to the extent of $9,255,479, making their total tax $17,646,014. These figures are contained in an official statement issued Feb. 20 by the Bureau of Internal Revenue of the Treasury Department. The 1919 tax returns have been compiled with unusual care, owing to insistent demand by Congress for more definite information about taxes being paid by industrial corporations. The total number of coal-mining companies making returns for 1919 was 3,228. Of this number, 1,581 had net incomes and 1,647 had no net income. The latter had deficits aggregating $23,748,807.

Rail Officials Oppose Cut in Coal Freights; Say It Would Have Little Effect on Prices in General

WELL-DEFINED opposition to a rate reduction on coal was manifested by railroad officials in their closing statements to the Interstate Commerce Commission in the freight-rate investigation. They took the position that a coal freight-rate cut would not be reflected in a corresponding reduction in the cost of articles into the manufacture of which coal entered. They gave comparisons of a 10 or 15 per cent rate cut on coal itself and on the articles manufactured in which coal played a part, showing that the coal-rate cut would yield less benefit to the consumer than a direct cut on the manufactured article itself.

T. C. Powell, of the Erie R.R., said the relationship of freight rates to the mine price of anthracite was less in 1921 than in 1913, 1914 or 1916. He declared that if the coal rates were reduced 10 per cent the railroads would have to haul 20 per cent more coal in order to earn a satisfactory revenue.

After the commission concludes consideration of statements of interested parties it will proceed to study the evidence with a view to formulating a decision. In the consideration of rate reductions it is said that the commission will first consider the coal rates.

The Colorado Metal Mining Association and other mining interests of that state asked that the coal and coke rates from producing centers to the metal mines and smelters be materially reduced.

The main argument against coal-rate reductions was made by H. A. Cochran, coal traffic manager of the Baltimore & Ohio R.R.

Replying to various witnesses representing shippers who have contended that a reduction in freight rates on coal is essential to the stimulation of business, Mr. Cochran told the commission that almost any reasonable reduction that could be made would hardly be reflected in selling prices. Estimating the average consumption of coal at 5.35 tons per household, Mr. Cochran estimated that a 10 per cent reduction in freight rates would mean an average saving to each householder of only $1.21 a year. He continued:

Exhibits filed by shippers with the commission show that the freight charges on a ton of coal from Athens, Ohio, to Detroit, Mich., is $2.47 per net ton. In constructing an automobile whose factory price is approximately $1,000, these exhibits show that about two tons of coal is used. The freight charges on this would be $4.94. The exhibits show that the freight charges on an automobile from Detroit to Athens would be $24.83. A reduction of 10 per cent in the freight rate on coal used in constructing the automobile would result in a reduction in the cost of 49⅜c. A 10 per cent reduction in the rate on the automobile would reduce the cost to the consumer by $2.48.

In like manner we find that a 10 per cent reduction in the rates on coal from Fairmont, W. Va., to Allentown, Pa., would reduce the cost of producing a barrel of cement slightly over 3c. while a reduction of 10 per cent in the rate on cement from Allentown to Fairmont would reduce the cost to the consumer by 7½c. a barrel A reduction of 10 per cent in the coal rates from Somerset, Pa., to Pinesburg, Md., would result in a saving in the production cost of lime of 7⅜c. per ton, while a reduction of 10 per cent in the freight charges on lime from Pinesburg to Somerset would result in a reduction in the cost to the consumer of 26⅜c. per ton of lime.

A 10 per cent reduction in coal rates would reduce the cost of producing a ton of copper 38⅜c., while a reduction of 10 per cent in the rate on copper would reduce the cost to the consumer by 76c.

Reports of the U. S. Bureau of Census for 1914 shows the value of manufactured products to have been a little over $24,000,000,000. In that year the bituminous coal production (422,000,000 tons) was but slightly greater than in 1921. Exhibits already filed show that the coal transported by railroads and used in steel plants, byproduct coke ovens and other industrials amounted to 40.2 per cent of the total production. The bituminous coal produced in 1921 was about 407,000,000 tons; 40.2 per cent of this would be 163,614,000 tons. Freight charges on this at an average rate of $2.27 per ton would be $371,403,780. The present index number of the Bureau of Labor Statistics is about 150. If the same amount of products was manufactured in 1921 as in 1914, the value would be over $36,000,000,000. The freight charges on coal used for industrial purposes would therefore be but slightly over 1 per cent of the total value. A 10 per cent reduction in bituminous coal rates would be equivalent to but 1/10 of 1 per cent of value of products.

Exhibits filed by the shippers show that the increase in bituminous coal rates on coal shipments to pulp mills averaged $1.96 per ton, or less than 1/20 the average increase in the price of paper.

So far as we can find from the record, not one shipper producing manufactured articles through the use of coal has gone on record as agreeing to translate a rate reduction on coal into a reduction in the selling price of his manufactured articles.

A 10 per cent reduction in coal rates on steel products would reduce the production cost only 64/100 of 1 per cent and a 15 per cent reduction would reduce the cost by less than 1 per cent. It is not believed that so slight a reduction would be reflected in the selling prices to the railroads.

A reduction of even 15 per cent on coal rates would mean a saving on pig iron of only from 23½c. per ton in the Pittsburgh district to 76½c. per ton in the Chicago district.

Congress at Loggerheads with Navy Over Expenditures for Fuel

CONGRESS seems to be at war with the navy over its expenditures for coal and other fuel. For several years since the war the House Appropriations Committee has tried to get the navy outlay for fuel reduced to the pre-war figure of something around $5,000,000 a year. During the war its fuel bill ran up to thirty odd millions a year. Last session the House cut the navy fuel allotment down to $17,500,000 and a deficiency item of $12,500,000 was requested by the navy at the special session last autumn. During hearings then the navy officials in charge of fuel were severely criticised for exceeding the appropriation made and the navy withdrew the deficiency estimate.

This session the navy sent in a modified estimate for a $12,000,000 deficiency to tide the navy over until June 30, when the fiscal year expires. The House Appropriations Committee, under the guidance of Chairman Madden, of Illinois, who is seeking a record as a saver, cut the navy estimate practically in two and in reporting the deficiency bill to provide for funds for the balance of the year gave the navy $6,282,685.

Considerable local publicity was given to the cut by navy officials, who pointed out that it would practically require its vessels to anchor at sea, as the present fund was exhausted. Mr. Madden, however, defended the action or the committee, saying that the country looked to Congress to cut appropriations and that government departments should keep within appropriations. He said the deficiency funds allotted would allow the navy $1,225,000 for fuel for the balance of the year and that it would be sufficient for all proper functions of the navy. The House voted the funds as reported by the committee with but little debate, Representative Hicks, of New York, a member of the Naval Committee, being the only member to inquire as to whether it would enable the navy to conduct the usual maneuvers. Mr. Madden said they had been cancelled by the navy and that naval vessels could be docked as well as cruise needlessly around.

J. E. McCoy Resigns Coal Secretaryship After 12-Year Tenure of Office

J. E. McCoy tendered his resignation as secretary-treasurer of the Southern Appalachian Coal Operators' Association Feb. 24 at a meeting of the executive committee at the offices of the association in the Holston National Bank Building, Knoxville, Tenn. The resignation was accepted and became effective March 1.

Mr. McCoy completed 12 years' service in that office Feb. 9 and was one of the best known and most popular of the bituminous coal association secretaries of the country, among whom he has a host of friends. When he accepted the secretaryship the association included twenty-two coal companies producing 2,000,000 tons of bituminous coal annually. Its membership now numbers approximately 100 companies producing normally from 6,500,000 to 8,500,000 tons of coal a year.

Mr. McCoy has not announced his plans. He left for New York City Wednesday, March 1, expecting also to spend a few days at Atlantic City.

Hultman Warns Massachusetts Mayors of Liklihood of Coal Strike

IN a memorandum relative to the coal situation, addressed to Mayors and other city officials of Massachusetts, Eugene C. Hultman, Fuel Administrator of that state, calls attention to the likelihood of a strike. Both the bituminous and anthracite coal miners, he says, threaten to strike on April 1, and the mine owners state that a strike is inevitable. "In reply to my request for information, Herbert Hoover, Secretary of Commerce, also advises, 'The stage is well set for a strike on April 1.' In my opinion this most aptly describes the present situation.

"The wage scale of the unionized bituminous coal miners expires April 1 and strike rumors have been emanating from both miners and operators. However, the bituminous fields are only partly unionized and there has been much part-time work or unemployment during the past year. Bituminous coal prices at the mine mouth have dropped from $10 in 1920 to $2.50 per ton at the present time.

"Bituminous coal from non-union fields can be produced in sufficient variety to satisfy all industrial and domestic requirements. Many operators and trade organizations claim that the production from these mines will be equal to the demands of the country under 1922 conditions of industrial and railroad activity. If there should be a strike, the region supplying New England will be called upon to supply some coal to consumers located in the Middle and Western states. Foreign export demand, however, which played such an important part in 1920 "profiteers' orgy," is now a negligible factor; in fact, large quantities of foreign coal are now available for import.

THREE MONTHS' SUPPLY OF BITUMINOUS COAL ON HAND

"According to the latest report of the U. S. Geological Survey, January, 1922, users of bituminous coal in New England had on hand about a three months' supply. New England receipt figures for January and February show an increase over any previous months since June, 1921.

"Labor in anthracite mines is highly unionized; the mine owners also are strongly organized. The miners have had steady employment at war-time wages during several years. In addition, the laws of Pennsylvania provide that anthracite can be mined only under the supervision of a 'boss miner,' who is licensed by the state and who must have served at least a two-years' apprenticeship in a Pennsylvania anthracite mine to be eligible for examination. The price of anthracite coal (stove size) at the mine has increased from $4 in 1914 to $8.10 per gross ton at the present time.

"The anthracite producers have informed me that they believe there will be a suspension of production in the anthracite fields due to a strike, vacation or walk-out, for an indefinite period after April 1.

"The economic movement for lower prices will compel producers of anthracite to reduce the present price. Anthracite is at present prices a 'luxury' fuel, and the difference existing between bituminous selling today in Boston at $8.25 per ton delivered and anthracite, with lower heat value, at $15 must be reduced, or bituminous coal will displace anthracite in this section of the country. Most of the domestic fuel requirements of the West and Middle West are now being supplied by bituminous coal.

"Domestic anthracite coal deliveries and stocks as of Feb. 1, 1922, in Massachusetts and metropolitan Boston are set forth in the following comparative tables compiled by this office:

DELIVERIES, STATE OF MASSACHUSETTS
(In Net Tons)

Coal year—April 1, 1920, to March 31, 1921	5,207,613
Ten months—April 1, 1921, to Feb. 1, 1922	4,322,379
Stocks on hand Feb. 1, 1922	691,923

DELIVERIES, METROPOLITAN BOSTON
(In Net Tons)

Coal year—April 1, 1920, to March 31, 1921	2,130,413
Ten months—April 1, 1921, to Feb. 1, 1922	1,766,837
Stocks on hand Feb. 1, 1922	235,831

"These figures indicate that there is no danger of a shortage for the present coal burning season. If the public act intelligently, the cost of domestic fuel for next winter should be lower than the cost of this season's supply. A prolonged restriction in the production during the spring and summer will tend to limit the price reduction at the mine, but the greater use of bituminous coal in conjunction with anthracite will stabilize the market for domestic fuel."

National Coal Association Convention Set For May 24 in Chicago

ASIDE from routine business, of which there was an accumulation, the Board of Directors of the National Coal Association at its quarterly meeting in Washington on March 2 found much to discuss in the latest developments with respect to the legal status of trade associations and their possible future activities.

President Bradley was directed to appoint a committee to call on the departments of Commerce and Justice for a more definite statement of the exact position of coal associations than is disclosed by the recent correspondence between Secretary Hoover and Attorney-General Daugherty. While Attorney-General Daugherty has made it plain that statistical matter may be compiled for dissemination to the public through the Department of Commerce, it has not been made entirely clear to the coal operators whether that same information can be first made public by associations themselves.

What the coal associations want is for the Attorney-General and the Secretary of Commerce to tell them precisely in what activities they can indulge and what are illegal, so that they can again proceed.

Of quite as much interest was the determination of May 24 as the date for the 1922 convention and the place as Chicago. The committee on arrangements consists of Harry N. Taylor, chairman; Dr. F. C. Honnold and Walter Cunningham.

The National Coal Association will be represented at the United States Chamber of Commerce convention in Washington on May 16, 17 and 18 by ten delegates and the foreign trade committee was appointed to represent the association at the convention of the Nation Foreign Trade Council at Philadelphia on May 10, 11, 12, 1922.

The railroad relations committee reported its main activities have recently been in connection with the Interstate Commerce rate inquiry. T. H. Watkins, chairman of the foreign trade committee, said that his committee had been unsuccessful in obtaining a reduction in freight rates at tidewater but are still at work on the matter.

George W. Reed, of Chicago, and Peter Kooi, of Wyoming, have resigned as directors of the National Coal Association. The Illinois associations were asked to name Mr. Reed's successor as a director. W. S. Megeath was elected to succeed Mr. Kooi. E. L. Douglas succeeds Mr. Reed as a member of the government coal contracts committee and Mr. J. C. Brydon becomes chairman.

Debtor Members of Old Tidewater Exchange Face Legal Action by Trustee

LITIGATION growing out of the insolvency of the old Tidewater Coal Exchange, New York City, developed an important legal decision handed down by the U. S. Circuit Court of Appeals in New York City, Feb. 20, by which debtor members of the old unincorporated exchange who have not settled with that organization for their tonnage overdrafts existing on April 30, 1920, when the activities of the exchange ceased, will be called to immediate account in suits instituted by William R. Coyle, trustee in bankruptcy of the exchange.

More than eighty concerns are in debt to the exchange for amounts aggregating more than $1,000,000, according to James F. Curtis and Emory R. Buckner, attorneys for the creditors' committee, petitioning creditors and the trustee in bankruptcy. As the assets are to be distributed among 100 or more creditors, interest in the results is widespread.

Actions against a number of the debtor shippers has already begun. These, as well as others soon to be started, will be pushed vigorously to an early trial.

IN SPITE OF all these expert predictions that business will get better, it will.—*Newspaper Enterprise Association.*

Illinois Operators Propose State Wage Conference; Lewis Says "No," but Farrington May Defy Union

By E. W. Davidson

DEVELOPMENTS in the Middle West during the past few days have advanced the momentous game of "coal chess" now being played by the operators of the land on one side and, on the other, the United Mine Workers of America in its various factions. But even now there is nobody wise enough to say just which way the game is headed.

On Wednesday, March 1, the operators of Illinois proposed to Frank Farrington, president of the Illinois miners, that he and his "associates in Illinois" meet them to "discuss the whole problem of producing coal" in that state. The operators notified John L. Lewis, president of the International union, that they had made the proposal. On Saturday it became known that Farrington had put the case before Lewis and that the International president had replied that "under the policy adopted by the convention it is not possible for District 12 to enter into separate negotiations for a new wage agreement" and that "in my judgment District 12 should refrain from any attempt" to make such a separate deal.

The final and most significant event of the week, however, was Farrington's announcement, Saturday, that "We shall give further consideration to the Illinois operators' invitation to meet them in district wage scale conference at a meeting of our district executive board to be held in St. Louis next Wednesday" [March 8]. This indicates an intention on Farrington's part to fly in the face of the International union, though he has not openly hopped off for such a flight yet.

The great question before the coal men of the land is: How far will Farrington go? Will his bitter feeling toward President Lewis lead him to a final and complete break with the International union in order to win a wage agreement for his men in Illinois? And if he does try to desert the rest of the national organization in its present battle, will he be able to hold his own ranks solid? His meeting in St. Louis may shed further light on these dark questions.

Farrington Professes Surprise at Operators' Offer

Mr. Farrington was in Chicago on Wednesday, March 1, when the operators' proposal was handed him. He was attending a routine business session of the joint conference at the time, and was in the city only for that purpose, he said. The sealed letter was laid before him during the afternoon, when a series of small matters were getting attention, and a studied effort was made to give the impression that he had no previous knowledge of the proposal.

After the meeting, when he read the operators' letter, signed by the presidents of the three Illinois associations, he repeated his well-worn declaration that he had never made any overtures to the operators for a separate agreement. He said that their action of that day was a surprise to him. "I don't see anything for Lewis to do now," said he, "except to let us go ahead with this thing, or else call his general strike. There doesn't seem to be any middle ground —no, not even the policy committee of the union can find any."

Illinois coal men were getting more confident every day that the policy committee could find a way to approve of separate district deals between miners and operators, but President Lewis' flat declaration to Farrington appeared to deflate some of this confidence.

Members of the Illinois Coal Operators Association point out that the proposal to Farrington may prevent government intervention, at least. Some of them frankly say the move will have been worth while if it results in nothing but that.

Even if Farrington should meet the operators, a lot of "discussing" could be enjoyed by all present, without any wage agreement resulting. The operators are as firm as ever in declaring that miners' wages must take a long drop. They might agree to let the check-off live, provided they could control the expenditure of money checked off, at least to the extent of preventing its use to combat other operators, but they give no indication of having up their sleeve any wage scale which would please Illinois miners.

The operators of Indiana have made no move to follow in the footsteps of Illinois producers and have no immediate intention of it, according to Phil Penna, of Terra Haute, secretary of the Indiana Bituminous Coal Operators Association.

The four communications of last week in the Illinois case follow, first of which is the letter of the three Illinois operators' associations to President Lewis on March 1:

> Replying to your telegram of Feb. 27, 1922, in view of the fact that each of your efforts to secure a meeting to consider agreement on joint wage conference have been abortive, we are, as per the attached copy of today's letter to Mr. Frank Farrington, requesting an immediate conference between the operators and miners of the State of Illinois.
>
> You will note therefrom the basis and reasons for our action herein.

The letter is signed by Rice Miller, W. K. Kavanaugh and H. C. Adams, the three association presidents.

The proposal to Frank Farrington, also dated March 1 and bearing the same signatures, was as follows:

> The Illinois coal operators have on two occasions, and in accord and compliance with the resolution adopted with the joint interstate agreement, March 31, 1920, accepted invitations extended by John L. Lewis, president of the United Mine Workers of America, to meet for the purpose of discussing the propriety of holding an interstate joint conference.
>
> In each instance, after appointing a time and place, and being urged by us to have such committee meeting, Mr. Lewis has advised us that the meeting would not be held. Under date of Feb 27 we are in receipt of the following telegram from him:
>
> "Reference invitation extended by mine workers for joint meeting Cleveland, March 3, operators of all districts except Illinois have indicated that they will not be present at such meeting. You are therefore advised that in view of these circumstances meeting will not convene at that date.
>
> In justice to the public, to the miner and to the operator we can see no reason why, because of the failure to confer in other states, a definite attempt to reach an agreement in the State of Illinois should not be made. We have carefully studied and discussed among ourselves terms, conditions and rates on which we are willing to make a contract, and we think an opportunity should be given to the operators in the State of Illinois to discuss with you and your associates in Illinois the whole problem of producing coal in the State of Illinois.
>
> In this connection we call to your attention the 32d Section of our Illinois contract, which reads as follows:
>
> "The joint executive boards are authorized and instructed to arrange for negotiations for the formation of a new contract to begin at a date not later than the expiration of this contract."
>
> We also call your attention to the fact that the Illinois contract, including this paragraph, comes under that guarantee both of yourself and the International union which was given to the President's Bituminous Coal Commission. Please note text:
>
> "Tenth: That the fulfillment of this agreement is guaranteed by the International union, and the fulfillment of joint agreements entered into in any district shall also be guaranteed by the officers of the international organization, as well as by the officers of the district, and it shall be their duty to see that all such agreements are carried out both in the letter and in the spirit."
>
> We realize, as the coal miners in this state must realize, that a large reduction in the cost of producing coal must be made before any general improvement in business conditions can be brought about.
>
> We believe also that by an earnest effort on the part of the operator and miner the serious problems involved in the production of coal in the State of Illinois can be settled and settled fairly to the public as well as to those interested directly in the industry.
>
> For these reasons we feel that it is incumbent upon us both to meet these conditions and carry out these agreements, and therefore suggest that we are prepared to meet with you for this purpose. It is our judgment that this meeting should be held at the earliest consistent date. If entirely agreeable to you we would like to suggest Chicago, Ill., Wednesday, March 8, as a place and time.

Mr. Farrington laid the matter before President Lewis in this telegram:

> Under date of March 1 the presidents of the three operators' associations in Illinois directed a letter to me requesting that we meet them in district wage-scale conference for the purpose of

negotiating a wage agreement to replace the one now in effect and as required by the 32d section of our agreement, which requires that negotiations for a new agreement must begin previous to the termination of our existing agreement. Considering that the operators sent you a copy of their letter to me, you are no doubt familiar with its contents, therefore there is no reason for my quoting it therein.

Our district executive board was convened for the purpose of giving consideration to said letter, and that body has directed me to communicate with you for the purpose of securing advice as to how we shall proceed. If we are permitted to go into negotiations with the Illinois operators for the purpose of negotiating a district agreement, our district convention must be convened to formulate a district wage scale policy before the negotiations can begin.

President Lewis' reply to Farrington was:

Your wire. Under policy adopted by reconvened international convention held in Indianapolis Feb. 14 to 18 inclusive it is not possible for representatives of District 12 to enter into separate negotiations with Illinois operators for the purpose of effecting a new wage agreement.

This policy contemplates the negotiation of a wage agreement with the Central Competitive Field as a base, and in the event that no such agreement is negotiated by April 1 declares in favor of a general suspension of mining operation, this action being subject to a referendum vote of the United Mine Workers of America, which is now being taken. This arrangement in its operation is manifestly in opposition to the policy of the district settlements and in my judgment District 12 should refrain from any attempt to consummate a district settlement under these circumstances.

The problems now confronting the mining industry are national in scope and cannot be solved by the operators and miners of any particular district. The fact that the operators of the Central Competitive Field who are obligated to meet us under the provisions of the basic interstate agreement have as yet failed to do so does not alter the situation. The thirty-second clause of your district agreement, to which you allude, is subordinate to the sixteenth clause of the international agreement, which provides for a joint meeting of miners and operators of the Central Competitive Field and which has been ignored and flaunted by the operators. The offer of the Illinois operators is obviously intended to destroy the effectiveness and strength of the national policy which has been enunciated and contemplates the breaking up of our forces into many separate units. Their policy is inherently selfish, economically unsound and contains no elements of consideration for public welfare. I therefore advise that the representatives of District 12 decline the offer of the Illinois coal operators.

What's Going to Happen Between Miners and Operators?

Chicago Coal Men Hazard Guess That After a Strike Wage Agreements Will Be Made by Districts Except in Pennsylvania and West Virginia

WHAT'S going to happen between miners and operators? In Chicago, coal men with trained ears always to the ground are hearing all sorts of rumblings. There is no doubt about the confusion in what they hear. The confusion is so great, in fact, that the wisest men among them are making no prophesies—publicly. But they have charted out the probable course of events in their own minds. A composite of the private opinions of a president, a vice-president, and two sales managers of four big coal companies operating in the Western fields can be set forth thus:

A strike still seems inevitable. That has been a foregone conclusion ever since the United Mine Workers took their stand at the Indianapolis convention and upset the conservative program which the International officers hoped to have adopted. The union's policy committee, with its almost unlimited power, continues to put an element of great uncertainty in the miners' position, but these four expert observers are convinced that the policy committee can do nothing to prevent a stoppage of work, at least in most fields. What that committee can and will do immediately after the strike goes into effect is what the four are wondering about.

The move of the Illinois Coal Operators' Association in proposing on March 1 to Frank Farrington, president of the Illinois district of the union, that he meet the operators to talk over a separate wage contract for Illinois, is, of course, an important factor.

In case Farrington obeys the orders of the International and declines to sign a wage agreement for his men with the Illinois operators, then the strike can be general and Farrington will have done nothing up to that moment to split the union. That question of whether Farrington, in his hatred of President Lewis, actually would cause a schism in union ranks if he could, causes a wide division of opinion among the four observers quoted here.

"He wouldn't do it," says one. "Frank does a lot of loud talking, but he wouldn't wreck the union."

"You bet he would," contributes one of the sales managers. "He no longer has any ambitions to be president of the United Mine Workers. If he gets a chance to make a good deal for his Illinois men—just watch him make it; yes, and without a strike, possibly, though I doubt this."

"Well," replied another of the four, answering the same question, "it would be worth a good deal to Illinois operators, maybe, if Farrington would do something with his men between now and April 1 that would keep the mines out here working. I'm not saying he would. But then —"

From that point the four opinions draw together again.

If there is a general strike the probability is that shortly thereafter Illinois will make a separate agreement with a flexible wage scale to enable union mines to meet open-shop competition, with Indiana and southern Ohio, or possibly the whole of Ohio, following suit with separate deals. In this the union's policy committee would have a hand, perceiving the futility of trying to keep up a losing country-wide battle when union finances are so low, and finding ways of convincing the district organizations that a compromise is necessary.

The four private prognosticators, however, are not guessing that district agreements will be signed with the union organization in either Pennsylvania—other than in the strongly organized anthracite district—or in West Virginia. There they believe the battle against the union, so determinedly started with the backing of the United States Steel Corporation, will be fought to a finish, and that the union cannot win. But with the union organization pulverized, the Eastern operators will soon find that the manifold difficulties of running mines with totally unorganized labor will compel a return to some sort of labor organization.

Whatever may be the final result of the Illinois operators' move toward a state agreement with Farrington, it may at least stave off government intervention for the time being, thus thwarting a fond union hope.

On one final point of prophecy the four observers diverge again. One man believes the separate state wage agreements will result in a spasm of price cutting that will reduce the whole coal industry to a serious state, and the others feel that the country's coal demands will be large enough within the year to lessen the bitterness of competition and thus help keep prices on a more even keel.

Anthracite Mine Workers Said to Oppose Referendum Vote on Strike

THE executive committees of the three districts of the United mine Workers covering the anthracite region will meet in New York on March 13, 1922, for a two days' session, prior to meeting the operators on the 15th. It is reported that the miners will then announce officially their objection to the referendum vote on a strike, ballots on which are now in the field, having been mailed out from International headquarters in Indianapolis, Ind.

Nova Scotia Pact Made but Not Ratified

AT a conference held in Montreal on March 1 between representatives of the United Mine Workers and the British Empire Steel Corporation an agreement was reached for a new wage contract involving 12,000 Nova Scotia coal miners. An official statement said that the terms of the agreement would not be published until it had been ratified by the members of the unions affected, to whom their delegates will report. The hope was expressed that the agreement would establish peace for a year.

Will Strike in Western Canada on April 1

NINE thousand coal-mine workers in the Western Canadian fields will strike, according to Robert Livett, chairman of the scale committee of the United Mine Workers of America, if the wage reductions now announced are put into effect.

Secretaries Davis and Hoover Disclaim Formal Effort to Bring About Wage Conference

NOT having authority to make a mandatory call for a conference between the operators and the men of the Central Competitive Field, Secretary of Labor Davis is proceeding informally in the hope that the good auspices of his department may be exercised in bringing about a joint wage conference of the four states. Up to March 6 no formal communication from the Department of Labor had gone out requesting this conference, but it is intimated that informal assurances have been had such as to sustain hope for success in the minds of the officials who seek the interstate negotiations. These officials recognize, however, the difficulty involved in the situation, because of the expressed intention of certain operators not to enter again into an interstate agreement.

One explanation offered as to why the government seeks a conference looking to such agreement is expressed by a prominent official as follows: "Without regard to what they may think of the violations charged against labor, the operators should make every effort to avoid the appearance of violating the terms of the wage contract now in force, which provides for an interstate conference before the end of the contract period. For this reason it is to be hoped that the operators will find it possible to meet the men in conference, even though the result be only to announce their determined intention not to renew an agreement affecting the several states."

During the week Representative Coughlin, of Pennsylvania conferred with Secretary of Labor Davis in connection with the coal situation, but both the Congressman and the Labor Secretary declined to disclose what transpired at the conference. Officials of the Department of Labor are cautious in answering queries covering developments in the situation. While the department has gathered a mass of data bearing on wages and conditions of employment about coal mines, whatever opinions officials in touch with the situation may have reached have not been disclosed nor has access been given to any of the data or conclusions which officials may have reached in a preliminary way.

Secretary of Commerce Hoover, who some time since was delegated by the President to use his good offices to effect a settlement of coal-mining labor problems, has refrained recently from discussion of the situation because every informal statement he has made has been given an official status and has led to many erroneous conclusions in various quarters. Mr. Hoover apparently has taken the position that the wiser policy for him is to remain silent and proceed with quiet informal negotiations looking to settlement of the wage question. Mr. Hoover told the House Appropriations Committee a few days ago when the committee was considering appropriations for the Department of Commerce that among other additional duties which had been imposed upon him was the possibility of settlement of coal-mining labor problems.

Lady Rhondda, First Woman in House of Lords, Known as Coal Queen

VISCOUNTESS RHONDDA, granted the privilege of taking a seat in the British House of Lords, March 2 is, like her late father, better known in British industrial circles than in fashionable society. Her father, who, as David H. Thomas of Wales, built up vast coal interests, owning ships, steel plants and other factories, died in 1918.

LADY RHONDDA

Lady Rhondda is director in twenty-seven companies and takes an active part in the management of several of them. The immense coal fields which she inherited from her father have given her the title of "the coal queen."

She is 39 years old and is the chairman of the board of directors of the Cambrian coal combine, which controls the greater part of the output of the southern Welsh fields, and is chairman of the British Fire Assurance Co.

Grange Urges Million Farmers to Rouse Public Sentiment Against Coal Strike

A MILLION farmers, members of the National Grange, are about to come out in opposition to a coal strike. In a special communication to its various local branches the national office is urging the farmers to create public sentiment against a strike. They take the position that the operators and miners should settle their economic differences without imposing a burden on the public through recourse to a strike. In a public statement the grange organization quotes many U. S. Senators in expressions against a coal strike.

In a letter to members of the Grange, dated Feb. 27. S. J. Lowell says: "The time has now arrived when it seems pertinent that the Grange should express itself in no uncertain terms in protest of a possible strike of mine workers and railroad employees. If a coal strike takes place, as seems possible, in April, the production of the fuel, upon which the prosperity and well-being of millions depend, will cease.

"If coal production stops people will suffer, and the spectacle of a comparatively small group of men and interests seizing the weapon of human misery and human suffering in order to impose their will, and their refusal to deal fairly with one another, and make others pay the penalty, is preposterous in this nation and time.

"The decision of every member of the Grange to do his part in building up an overwhelming public opinion for a fair and just settlement and the enforcement of such settlement to the utmost, will prevent any strike. Owners, workers and the government must feel the power of this public opinion. No man or set of men in this country can succeed against a united public sentiment.

Production and the Market

Weekly Review

PRODUCTION of bituminous coal has definitely outstripped the demand, for the time being at least. The general tone of the market is one of indifference. Here and there buyers have taken heart at the indication of government intercession by way of a plan to bring operators and miners together for a conference on the wage question. Much coal has been flowing to storage recently and the consumer is not excited over the impending struggle, as he feels that strike needs over present reserves can be filled by non-union coals in the event of prolonged interruption to union production.

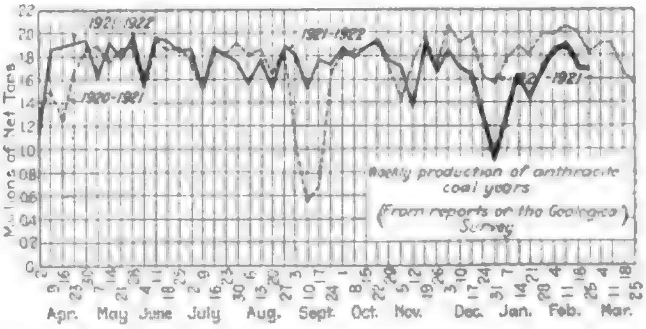
Large consumers—railroads and public utility plants—are still taking reserve tonnage, but in a more leisurely manner and are now inclined to shop around before buying. The entire coal fraternity is in a state of uncertainty. Strike views are so widely different that many producers and sellers refuse to predict, and the market reflects this uncertain situation. The more conservative miners are said to recognize that the trend of the times makes a wage reduction inevitable and would favor settlement after some preliminary skirmishes have taken place.

Heavy Tonnage Offerings Weaken Spot Prices

Too heavy offerings of tonnage have weakened prices. As was the case last fall, there has been too much use of the strike threat as a sales argument and it has been so effective that reserves are in some cases adequate for a long term. A mining suspension now appears really necessary before any appreciable market recovery can be expected. *Coal Age* Index of spot prices was 179 on March 6, compared with 180 on Feb. 27 and 192, Jan. 2.

Indications are not lacking that there will be an increased consumption of coal after April 1. Iron and steel operations are more than double those of last December. Automobile and parts industries are more active. The upward price trend of farm products also encourages the belief that the coal market should be in a more healthy state after the wage controversy is settled. Considerable optimism prevails as to business, in the not-distant future, when downward adjustments in mine and transportation costs of coal become a reality.

Domestic producers have experienced a rush of orders in the Midwest regions, where a blizzard brought out the need for current supplies. This demand is only temporary, however, as neither householder nor retailer figures on taking more than actual needs for the balance of the coal year.

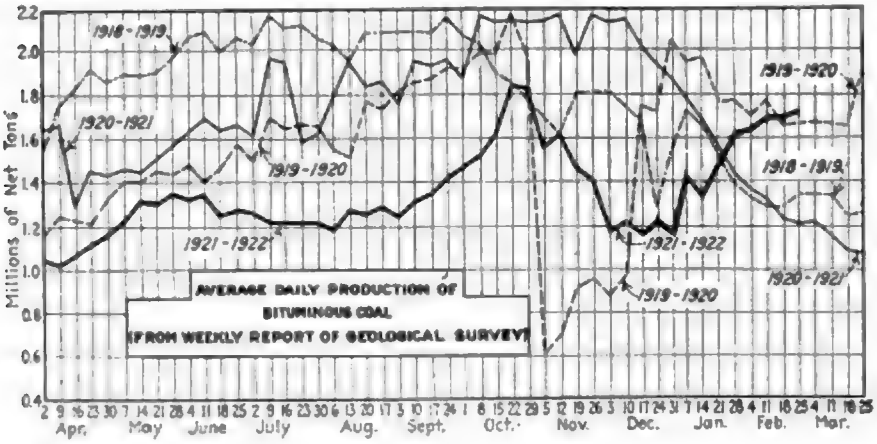


Anthracite domestic business is largely confined to tonnage needed to eke out the winter. The industry is confronted with the imperative need for lower prices if bituminous competition is not to become insuperable. The shortage of steam sizes has been lessened with the recent heavier offerings.

BITUMINOUS

Production resumed its upward swing during the week ended Feb. 25, when 10,348,000 net tons were mined, according to the Geological Survey. The output for the preceding week was 10,276,000 tons. Reports of loadings for the early part of last week indicate that the present production rate is being maintained.

Since the first of the year the tonnage mined has exceeded consumption and stocks have increased perceptibly. It is estimated that about 11,000,000 tons of additional



Estimates of Production

(Net Tons)

BITUMINOUS		
Week Ended	1921—1922	1920—1921
Feb. 11 (b)	10,309,000	7,859,000
Feb. 18 (b)	10,276,000	7,489,000
Feb. 25 (a)	10,348,000	7,432,000
Daily average	1,725,000	1,239,000
Coal year	381,375,000	489,361,000
Daily av. coal yr.	1,374,000	1,756,000
ANTHRACITE		
Feb. 18	1,703,000	2,010,000
Feb. 25 (a)	1,701,000	1,816,000
Coal year	77,674,000	81,774,000
COKE		
	1922	1921
Feb. 18	135,000	219,000
Feb. 25 (a)	144,000	193,000
Calendar year	984,000	1,917,000

( ) Subject to revision. (b) Revised from last report.

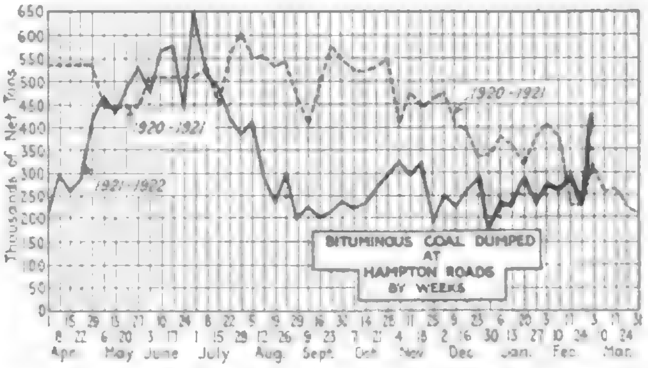
coal would have to be stored to raise reserves to the level reached at the end of the war.

All-rail shipments to New England increased considerably during the week ended Feb. 25, when a total of 4,151 cars passed the five gateways, as compared with 3,368 in the preceding week. Shippers have been pushing their sales in that territory, but heavy price cuts are necessary to meet the competitive tonnage from Hampton Roads.

Dumpings at the Roads for all accounts were 371,753 net tons during the week ended March 2, a sharp increase as compared with the preceding week. The bulk of the tonnage went to New England, although bunker trading is more active. Off-shore exports have gained considerably in the past few weeks and shippers are centering their interest in South American business. Increasing prices of British coals lead to the hope that American exporters can soon get into a better position, especially as the prospects are good for lower delivered prices. February dumpings at Hampton Roads exceeded the January figure by more than 100,000 tons.

The Federal Reserve Board in its report on business conditions for February says that anticipation of a coal strike brought an improved demand, particularly from the railroads. The roads have been able to move all the coal they want and to handle the increased industrial fuel shipments with very little delay. Because of this movement, however, the number of idle coal cars has steadily declined.

Quotations are only firm at best and there are increasing lots of demurrage coal to be picked up. Non-union coals are still active but their price rise has been checked by the lack of demand. The recent market activity, however, was not up to that of last October, when the rail strike threatened.



Non-union coal evidently is being considered by consumers as available in sufficient quanties to fill such a

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Feb. 6 1922	Feb 20 1922	Feb. 27 1922	March 6 1922†
Pocahontas lump	Columbus	$3.25	$3.25	$3.25	*$3.15@$3.25*
Pocahontas mine run	Columbus	2.15	2.10	2.15	*1.75@ 2.00*
Pocahontas screenings	Columbus	1.30	1.55	1.40	*1.25@ 1.50*
Pocahontas lump	Chicago	3.00	3.15	3.15	2.75@ 3.50
Pocahontas mine run	Chicago	2.00	2.15	2.15	*1.75@ 2.25*
Pocahontas lump	Cincinnati	3.15	3.15	3.15	3.00@ 3.25
Pocahontas mine run	Cincinnati	1.85	1.75	1.75	1.75
Pocahontas screenings	Cincinnati	1.20	1.15	1.15	1.00@ 1.25
*Smokeless mine run	Boston	4.70	4.55	4.60	**4.60@ 4.75**
Clearfield mine run	Boston	1.95	1.95	1.95	1.65@ 2.25
Cambria mine run	Boston	2.45	2.45	2.45	2.25@ 2.60
Somerset mine run	Boston	1.90	1.90	1.90	1.75@ 2.00
Pool 1 (Navy Standard)	New York	2.85	3.00	3.00	2.75@ 3.25
Pool 1 (Navy Standard)	Philadelphia	3.05	3.05	3.05	2.85@ 3.25
Pool 1 (Navy Standard)	Baltimore	2.55	2.55	2.70	2.70
Pool 9 (Super. Low Vol.)	New York	2.35	2.50	2.40	**2.25@ 2.75**
Pool 9 (Super. Low Vol.)	Philadelphia	2.40	2.45	2.45	2.20@ 2.65
Pool 9 (Super. Low Vol.)	Baltimore	2.20	2.25	2.40	*2.25@ 2.35*
Pool 10 (H. Gr. Low Vol.)	New York	2.05	2.10	2.00	**1.90@ 2.25**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.10	2.10	2.10	1.95@ 2.20
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.00	2.05	2.10	**2.10@ 2.15**
Pool 11 (Low Vol.)	New York	1.75	1.75	1.75	1.65@ 1.90
Pool 11 (Low Vol.)	Philadelphia	1.75	1.75	1.75	1.65@ 1.85
Pool 11 (Low Vol.)	Baltimore	1.85	1.75	1.85	**1.85@ 2.00**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.50	1.50	1.50	**1.50@ 1.65**
Pool 54-64 (Gas and St.)	Philadelphia	1.50	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)	Baltimore	1.45	1.40	1.40	**1.50@ 1.60**
Pittsburgh sc'd. gas	Pittsburgh	2.65	2.65	2.65	**2.60@ 2.75**
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@ 2.20
Pittsburgh slack (Gas)	Pittsburgh	1.65	1.65	1.65	1.60@ 1.70
Kanawha lump	Columbus	2.65	2.65	2.55	*2.25@ 2.75*
Kanawha mine run	Columbus	1.65	1.65	1.60	1.50@ 1.75
Kanawha screenings	Columbus	1.30	1.30	1.40	*1.25@ 1.50*
W. Va. Splint lump	Cincinnati	2.65	2.35	2.25	2.00@ 2.50
W. Va. Gas lump	Cincinnati	2.25	2.05	1.85	**1.75@ 2.25**
W. Va. mine run	Cincinnati	1.45	1.50	1.40	*1.25@ 1.50*
W. Va. screenings	Cincinnati	1.10	1.20	1.30	1.25@ 1.35
Hocking lump	Columbus	2.65	2.65	2.55	**2.50@ 2.75**
Hocking mine run	Columbus	1.75	1.90	1.90	1.75@ 2.00

	Market Quoted	Feb. 6 1922	Feb. 29 1922	Feb. 27 1922	March 6 1922†
Hocking screenings	Columbus	1.35	1.30	1.50	*$1.40@$1.50*
Pitts. No. 8 lump	Cleveland	3.00	3.10	3.10	3.00@ 3.25
Pitts. No. 8 mine run	Cleveland	2.00	1.95	2.00	1.95@ 2.00
Pitts. No. 8 screenings	Cleveland	1.70	1.65	1.80	1.75@ 1.85
Midwest					
Franklin, Ill. lump	Chicago	3.65	3.30	3.25	2.85@ 3.65
Franklin, Ill. mine run	Chicago	2.35	2.50	2.50	2.25@ 2.75
Franklin, Ill. screenings	Chicago	2.00	2.00	2.00	1.75@ 2.25
Central, Ill. lump	Chicago	3.00	3.00	3.00	2.75@ 3.25
Central, Ill. mine run	Chicago	2.35	2.35	2.35	2.25@ 2.50
Central, Ill. screenings	Chicago	1.65	1.80	1.80	*1.65@ 1.85*
Ind. 4th Vein lump	Chicago	3.25	3.25	3.25	3.00@ 3.50
Ind. 4th Vein mine run	Chicago	2.50	2.50	2.50	2.35@ 2.65
Ind. 4th Vein screenings	Chicago	1.85	2.00	2.00	**2.00@ 2.25**
Ind. 5th Vein lump	Chicago	2.95	3.20	2.90	*2.65@ 3.00*
Ind. 5th Vein mine run	Chicago	2.25	2.25	2.25	**2.15@ 2.50**
Ind. 5th Vein screenings	Chicago	1.55	1.75	1.75	*1.50@ 1.55*
Standard lump	St. Louis	2.90	2.75	2.60	2.50@ 2.75
Standard mine run	St. Louis	1.90	1.95	1.95	1.85@ 2.00
Standard screenings	St. Louis	1.00	1.20	1.10	1.00@ 1.25
West. Ky. lump	Louisville	2.60	2.50	2.65	*2.35@ 2.60*
West. Ky. mine run	Louisville	1.90	1.85	1.85	1.70@ 2.00
West Ky. screenings	Louisville	1.15	1.40	1.80	1.65@ 2.00
South and Southwest					
Big Seam lump	Birmingham	2.90	2.90	2.80	2.50@ 2.75
Big Seam mine run	Birmingham	1.85	1.85	1.85	1.70@ 2.00
Big Seam (washed)	Birmingham	2.10	2.10	1.85	1.75@ 2.00
S. E. Ky. lump	Louisville	2.90	2.60	2.55	*2.40@ 2.50*
S. E. Ky. mine run	Louisville	1.45	1.55	1.55	1.50@ 1.65
S. E. Ky. screenings	Louisville	1.15	1.20	1.35	*1.25@ 1.35*
S. E. Ky. lump	Cincinnati	2.90	2.50	2.35	*2.00@ 2.50*
S. E. Ky. mine run	Cincinnati	1.45	1.50	1.75	*1.25@ 1.60*
S. E. Ky. screenings	Cincinnati	0.85	1.10	1.15	**1.15@ 1.25**
Kansas lump	Kansas City	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads

†Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Feb. 20, 1922		Feb. 27, 1922		March 6, 1922†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.00@ 7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.85
Egg	New York	2.61	7.25@ 7.75	7.60@ 7.75	7.25@ 7.75	7.60@ 7.75	*7.25@ 7.60*	7.60@ 7.75
Egg	Philadelphia	2.66	7.15@ 7.75	7.75	7.15@ 7.75	7.75	7.15@ 7.75	7.75
Egg	Chicago	5.63	7.50*	7.40*	7.50*	7.40*	7.50*	*6.95@ 7.40**
Stove	New York	2.61	7.75@ 8.10	7.90@ 8.10	7.75@ 8.10	7.90@ 8.10	7.75@ 8.10	7.90@ 8.10
Stove	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25
Stove	Chicago	5.63	7.75*	7.60*	7.75*	7.60*	7.75*	*7.20@ 7.60**
Chestnut	New York	2.61	7.85@ 8.10	7.90@ 8.10	7.85@ 8.10	7.90@ 8.10	7.85@ 8.10	7.90@ 8.10
Chestnut	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25
Chestnut	Chicago	5.63	7.75*	7.60*	7.75*	7.60*	7.75*	*7.20@ 7.60**
Pea	New York	2.47	5.00@ 5.50	5.75@ 6.50	5.00@ 5.25	5.75@ 6.45	*5.50@ 5.60*	5.75@ 6.45
Pea	Philadelphia	2.38	4.75@ 5.00	6.15@ 6.25	4.75@ 5.00	6.15@ 6.25	4.75@ 5.00	6.15@ 6.25
Pea	Chicago	5.63	6.10*	6.10*	6.10*	6.10*	*6.00**	*5.60@ 6.10**
Buckwheat No. 1	New York	2.47	3.00@ 3.50	3.50	3.00@ 3.50	3.50	3.00@ 3.50	3.50
Buckwheat No. 1	Philadelphia	2.38	2.75@ 3.50	3.50	2.75@ 3.50	3.50	2.75@ 3.50	3.50
Rice	New York	2.47	2.00@ 2.50	2.50	2.00@ 2.50	2.50	**2.00@ 2.60**	2.50
Rice	Philadelphia	2.38	2.00@ 2.25	2.50	2.00@ 2.50	2.50	2.00@ 2.50	2.50
Barley	New York	2.47	1.50@ 1.75	1.50	1.50@ 1.75	1.50	*1.40@ 1.60*	1.50
Barley	Philadelphia	2.38	1.25@ 1.75	1.50	1.50@ 1.75	1.50	1.50@ 1.75	1.50
Birdseye	New York	2.47	....	2.00@ 2.50	1.60@ 1.90	2.00@ 2.50	*1.65@ 1.75*	2.00@ 2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type, declines in italics.

gap in supply as may be occasioned by a strike. From all sections the reports are much the same—a growing indifference to sellers' offerings. The inference also gained from this is that in many cases considerable coal stocks have been built up and that consumers hesitate to take on further safeguards when there is lower-priced fuel in sight later this year.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report

Fields	Six Months July to Dec. 1921	1922 to Date	Week Ended Feb. 18
Illinois	44.8	50.6	55.5
Indiana	41.4	65.1	58.0
Ohio, southern	22.9	23.3	21.7
Ohio, north and central	52.6	43.4	47.6
Pittsburgh*	30.4	26.6	34.5
Pittsburgh†	41.2	56.1	41.0
Westmoreland	54.9	54.9	54.3
Central Pennsylvania	39.1	46.5	55.2
Somerset County	55.5	72.9	78.2
Cumberland-Piedmont	46.6	49.7	47.7
Panhandle, W. Va	55.3	45.8	52.9
Fairmont	35.3	30.9	37.2
Winding Gulf	45.7	60.4	63.7
New River	24.3	27.8	32.7
Pocahontas	49.8	57.5	59.3
Tug River	48.1	58.6	74.3
Kanawha	26.0	12.9	14.3
Logan	47.6	57.0	65.8
Kenova-Thacker	38.2	49.6	60.6
Harlan	53.3	51.7	59.3
Virginia	54.8	53.7	57.8
Alabama	63.5	60.3	64.1
N. E. Kentucky	32.9	41.8	49.7
Western Kentucky	32.5	33.8	35.4
Hazard	51.7	60.8	69.1
Iowa	57.4	74.8	72.7
Missouri	50.7	61.9	60.4
Kansas	42.0	48.1	61.7
Oklahoma	63.9	58.3	55.9

*Rail and river mines combined.
†Rail Mines.
Bold face—Non-union.

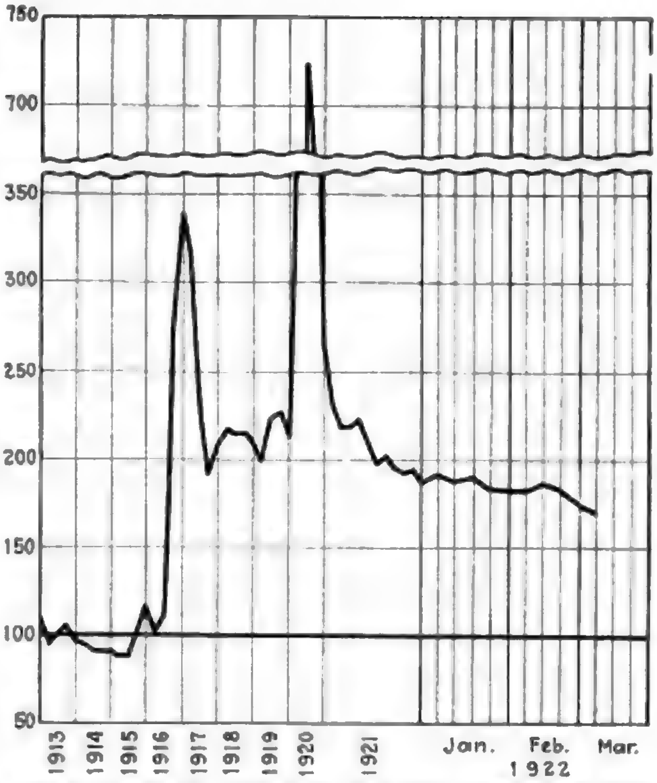
COKE

Beehive coke production increased to 144,000 net tons during the week ended Feb. 25, from 135,000 tons in the preceding week. This was the largest production attained in any week since last March.

In the last three weeks coke prices have advanced nearly 50c. all around. From present indications, however, the impetus has been removed. The increase was attributable mainly to the coming coal strike but as the coal market fails to gain further ground coke producers have no trouble in securing tonnage at softer prices.

ANTHRACITE

Production of hard coal was 1,701,000 net tons during the week ended Feb. 25, 1922, only 2,000 tons less than in the preceding week. A slight temporary improvement was caused by the recent storms, but domestic purchases are being made on a hand-to-mouth basis. Steam sizes are still in good call although the heavy movement has softened independent prices.



Coal Age Index 179, Week of March 6, 1922. Average spot price for same period, $2.17. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

Neither the retailer nor the householder considers it necessary to have more than a small supply on hand. It is quite likely that the new coal year will see these stocks reduced to a minimum, so that buyers will be able to take full advantage of the hoped-for lower prices. New England is an exception to this policy. All-rail shipments during the week ended Feb. 25 were 3,362 cars, as compared with 2,812 cars in the previous week. Better buying prevails in that section as retailers are extending their stocks to cover the month of May.

TEN DEPARTMENTS OF THE CITY OF NEW YORK are this week asking for bids on 87,000 tons of anthracite and bituminous coal, wagon and barge delivery. Bids will be opened March 16.

Coal Paragraphs from Foreign Lands

CZECHOSLOVAKIA—Deposits of coal have been discovered in sub-Carpathian Russia, near Lupca, in the province of Marmaros. Exploitation is to be commenced during the spring. The Government has authorized the Zivnostenska Banka to form a company for trade in coal with headquarters at Prague.

GERMANY — Ruhr production during the week ended Feb. 18 was 1,950,000 metric tons, according to a cable to *Coal Age*. The preceding week's output was 1,821,000 tons.

Railroad freight rates for the transport of coal up the Rhine have been increased by 120 marks to 1,656 marks per 10 tons.

ITALY—Latest quotations of Cardiff best steam on the Genoa market range around 42s., according to a cable to *Coal Age*. This is an increase of 3s. from last week's market.

AUSTRIA —The Austrian coal reserve has been greatly diminished, owing to the German railway strike and the Czecho-Slovak mine strike. No coal has been received from Czecho-Slovakia recently and the Vienna city gas and electric works are running short.

INDIA. — The coal market is firm. Foreign consignments are arriving. Mills are purchasing small quantities. There is a stock of about 30,000 tons of Bengal coal in Bombay.

BELGIUM — Industrials are slack, buyers being reserved owing to the insignificant amount of the decline in home prices and on account of English offers. There have been big transactions in English coal at 92.50 fr., delivered, or 15 fr. below Belgian prices.

BRAZIL—A measure has been approved by the Chamber of Deputies providing for a 10 per cent clearance tax on imported coal. Although coal is on the free list, like all other articles on this list, it paid a small clearance tax, in this case 2 per cent. The increase to 10 per cent is equivalent to subjecting it to a tariff duty. Another bill approved by the finance committee but not yet through the Chamber of Deputies, authorizes the government to enter into agreements with the coal producing states and the Brazilian railways and steamship lines for preferential treatment of local coal.

CHINA—Among other commodities, the export of coal from the colony of Hong Kong has been prohibited.

POLAND—The restrictions touching the purchase and sale of coal within the Polish State have been abolished as from March 1. As for the free export of coal abroad, that will depend on how the Upper Silesian problem is finally resolved.

SWEDEN—During January, 1922, imports of coal at Stockholm were 13,000 tons.

Foreign Market And Export News

British Production Registers Another Increase; Export Markets Are Stronger; Prices Up

STEADILY increasing production in Great Britain has followed the better export market. Production during the week ended Feb. 18, as cabled to *Coal Age* was 5,001,000 gross tons, as compared with 4,903,000 tons in the preceding week, and 4,803,000 during the week ended Feb. 4.

Forward business includes 170,000 tons for Bombay and Baroda railways, April to December deliveries on Durham bunkers, and April to August orders for best Blyth steam coals. Prices are stronger on practically all grades.

The Crown Agents for the Colonies, acting for the Government of Mauritius, has invited tenders for the supply of 12,000 tons of Welsh steam coal or South African coal.

In view of the complaints that whereas wages have fallen but prices have not to any appreciable extent, the owners have issued a statement to the effect that at the end of December, 1920, when the coal industry was under Government control, the total cost per ton other than wages amounted to 9s. 9½d., of which 6s. 5.33d. represented the costs of timber and stores, and 3s. 4.28d. other costs. Since the industry was decontrolled, the cost per ton for timber and stores has steadily declined, and is now about 3s. per ton. Other costs, excluding timber and stores, consist of a variety of items, such as the salaries of the clerical and administrative staff, depreciation and repairs, local rates, royalties—which generally speaking are on the pre-war basis—and welfare levy which it is not in the power of collieries to control.

As the result of an agreement recently concluded between the owners and the men, costs now bear an apparent increase in respect to wagon charges, but this increase is set off by a figure on the other side of the account in respect of wagon revenue.

In the northeastern fields there is a great loss in output and rise in costs at the beginning of every quarter in the collieries, due to men going into seams which are new to them, and leave the flats to go hewing elsewhere.

The owners have again approached the railway companies to reduce further the rates for transporting coal. The owners pointed out that the output of coal has steadily increased, and that such reductions in price as have been made are largely at the expense of owners' profits and miners' wages.

United States January Exports of Bituminous Coal, by Customs Districts

Customs Districts	Gross Tons
Vermont	519
St. Lawrence	113,509
Rochester	22,317
Buffalo	233,458
New York	3,883
Philadelphia	12,876
Maryland	11,030
Virginia	69,406
South Carolina	14,007
Florida	1,629
Mobile	131
New Orleans	360
Galveston	6
San Antonio	101
El Paso	5,489
San Diego	6
Arizona	904
San Francisco	717
Washington	685
Dakota	2,564
Duluth & Superior	7,820
Michigan	97,576
Ohio	44,920
Total	643,913

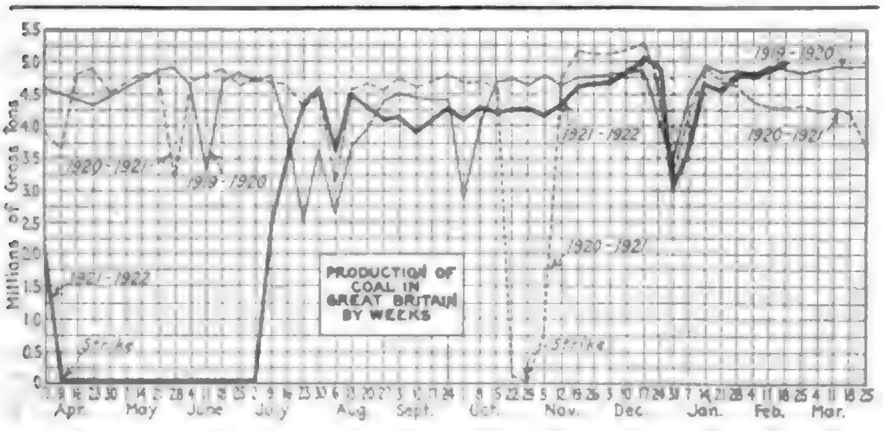
Hampton Roads Activity Increases

February showed a decided revival in the coal trade, with total dumpings of 1,089,378 tons, against 937,664 tons for January. Dealers are highly optimistic over the situation.

Coastwise business was responsible largely for the increased dumpings, although both bunker and export business had their share in bringing up the total. South American markets are improving.

The N. & W. Piers dumped 503,551 tons in February, the Virginian, 330,783 tons, and the C. & O. 255,044 tons. At all piers the end of the month found considerable tonnage awaiting cargo, with prospect of continued good business.

Faith in the local situation has been indicated by the recent advent of new coal concerns and the expansion of facilities of concerns already in business. Interest among coal men seems to be centered on South America, and they are preparing to develop trade in that direction.



Hampton Roads Pier Situation

	Week Ended Feb. 23	Week Ended March 2
N. & W. Piers, Lamberts Point:		
Cars on hand	1,889	2,156
Tons on hand	109,520	126,651
Tons dumped	101,143	160,268
Tonnage waiting		12,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,859	1,585
Tons on hand	93,450	79,250
Tons dumped	56,206	128,643
Tonnage waiting	37,654	28,200
C. & O. Piers, Newport News:		
Cars on hand	1,655	1,273
Tons on hand	87,750	63,730
Tons dumped	52,108	83,442
Tonnage waiting	9,600	455

Export Clearances, Week Ended March 2, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Nor. S.S. John Blumer, for Castries	2,472
Am. S.S. Levisa, for Jamaica	2,409
Brazil:	
Nor. S.S. Fragner, for Rio de Janeiro	7,015
For Canada:	
Br. S.S. Bethlehem, for St. Johns, N. B.	3,019
Du. S.S. Parkhaven, for St. Johns, N. B.	6,577
For Chile:	
Br. S.S. Vestalia, for Valparaiso	995
For Colombia:	
Nor. S.S. Lom, for Cartagena	995
For Cuba:	
Nor. S.S. Bratland, for Santiago	2,126
Ger. S.S. Franziska, for Havana	2,624

FROM PHILADELPHIA:

For Cuba:	
Br. S.S. Berwindale, for Havana	

Pier and Bunker Prices, Gross Tons

PIERS

	Feb. 25	March 4†
Pool 9, New York	$5.45@$5.75	[illegible]
Pool 10, New York	5.25@ 5.40	[illegible]
Pool 9, Philadelphia	5.60@ 5.90	[illegible]
Pool 10, Philadelphia	5.25@ 5.60	[illegible] 5.60
Pool 71, Philadelphia	5.70@ 6.00	5.70@ 6.00
Pool 1, Hamp. Rds.	4.65	*4.60*
Pools 5-6-7 Hamp. Rds.	4.25	4.25
Pool 2, Hamp. Rds.	4.50	*4.45*

BUNKERS

	Feb. 25	March 4†
Pool 9, New York	$5.70@$6.05	*$5.70@$5.90*
Pool 10, New York	5.55@ 5.75	*5.40@ 5.50*
Pool 9, Philadelphia	5.90@ 6.15	*5.90@ 6.10*
Pool 10, Philadelphia	5.70@ 5.85	*5.60@ 5.85*
Pool 1, Hamp. Rds.	4.80	*4.75*
Pool 2, Hamp. Rds.	4.60	*4.55*
Welsh, Gibraltar	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	39s. t.i.b.	39s. t.i.b.
Welsh, Messina	36s. 6d. t.i.b.	36s. t.i.b.
Welsh, Algiers	34s. f.o.b.	34s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	40s. f.a.s.	40s. f.a.s.
Welsh, Teneriffe	40s. f.a.s.	40s. f.a.s.
Welsh, Malta	40s. f.o.b.	40s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Welsh, Naples	39s. f.o.b.	39s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Belgian, Antwerp	30s.	30s.
Alexandria	47s.	47s.
Bombay	38 rupees	38 rupees
Capetown	42s.	42s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	Feb. 25	March 4†
Admiralty, Large	27s. 9d.	27s.@ 27s. 6d.
Steam, Smalls	19s. 9d.	19s. 6d.@ 20s.
Newcastle:		
Best Steams	25s.	25s.
Best Gas	23s. 6d.	23s.@ 24s.
Best Bunkers	22s. 9d.	**23s. 6d.@ 24s.**

†Advances over previous week, shown in **heavy type**; declines in *italics*.

North Atlantic

Better Coals Move Well; Unsold Tonnage Hurts Prices

Industrial Consumers Indifferent to Strike, Having Confidence in Non-Union Capacity—Contract Negotiations in Abeyance Pending Wage Settlement — Inquiries Are Only Feelers.

LINE demand exceeds that at Tidewater, but a distinct attitude of indifference is noted among industrial fuel buyers, despite the certainty of a strike. The feeling prevails that non-union producers can fill any gaps in reserve stocks that may exist when the strike comes. There is an increasing unsold tonnage en route which has a softening tendency on prices.

Contract negotiations are absolutely in abeyance until the strike is settled. Many inquiries are heard but most of these are simply "feelers," as the future is too uncertain for either side to tie up tonnage at this time.

NEW YORK

Demand is not brisk and there is no rush to stock up. It is evident that those who need coal have it, while those who do not need it are not buying.

There is a well-founded feeling that if the union miners quit work the non-union mines will be able to take care of the demand throughout the summer. Consumers are not showing any signs of worry. Some manufacturers are said to have from 30 to 90 days' supply on hand.

There is no trouble to move the better grades whether they be on contract or in the spot market. Some of the railroads are said to be preparing to load for their own use on and after March 14, using their own cars and not unloading them until necessary.

There is no tendency on the part of either buyers or producers to enter into contract relations. What might happen after the new wage scale is signed is conjectural.

BALTIMORE

During February a total of only 12,584 tons was exported from Baltimore, not a single ship clearing from Feb. 10 to the end of the month. The collapse of the European business is shown by the fact that not a single vessel has cleared from Baltimore since Jan. 1 for European delivery.

For some time past British ships have been carrying Welsh coals as ballast and selling the fuel for whatever figure they could get at the port of destination This practice has reached even to the west coast of the United States. With the certainty of a strike in the coal fields there has been an utter failure on buying stimulation here.

There is a keen competition that is undercutting even the recognized low market. It is a remarkable fact that some recent sales have been noted here from producer to consumer direct at prices which Baltimore middlemen could not get even from their long-established mine connections.

UPPER POTOMAC

A few mines are resuming operation, following the acceptance by miners of an adjustment in wages but such resumption is on a small scale, so that taking the region as a whole the output is extremely limited. A drop in prices has tended to further restrict output.

PHILADELPHIA

Trade is quiet, although there are many rumors afloat of certain big interests being in the market for heavy tonnages. Railroads continue in the plan of moderate buying and it is believed that much of the coal they do take is non-union.

Prices remain fairly firm, and at times there is an upward tendency, but never sustained long enough to justify a change in the average quotations. Increased buying of the high-quality coals has an upward tendency on these quotations, and sales are occasionally reported at a trifle better than the market. It looks as if there would have to be an extraordinary demand on all grades before any permanently higher prices are achieved.

The iron industry has been considerably set back recently by some of the largest plants closing down again for an indefinite period, one within the city usually employing 10,000 men, having less than 1,000 on their rolls.

CENTRAL PENNSYLVANIA

The miners' demand for five days and six hours precludes any settlement until the demand is repudiated. The statement that the miners are not asking for a raise in view of the demand for a week of thirty hours at existing rates is a fallacy.

It really amounts to a demand for an increase of about 24 per cent on the total cost of producing coal in the way of wages. The action of the administration at Washington in trying to convene a joint conference is looked upon with much disfavor by the operators, who are of the opinion that if the government tries to force arbitration, there will be but one alternative, which is to insist that the wage rates in the non-union fields shall be made the same as in the union sections.

Production was largely increased during February in anticipation of a strike.

FAIRMONT

Production during the last week of February was on a larger scale than during the corresponding period of January. Railroad fuel shipments during the early part of the week were heavy but declined somewhat during the latter part of that period.

New England

Consumers Defer Buying; Steam Users' Reserves Ample

Marine Rates Soften—No Indication of Runaway Market — Low Delivery Costs of Southern Coals Severely Handicap Central Pennsylvania Product

THE majority of steam users have ample fuel reserves for the present. The recent softening of marine freights and prices f.o.b. Hampton Roads is enough to induce would-be purchasers to postpone action until a little later date, as there is no indication in sight of a runaway market. Small orders show the extent of the intensive selling campaigns which are being conducted.

All-rail shippers are striving hard to obtain business but the lowered delivered costs of Southern coals are discouraging. This element imposes an almost impossible handicap on central Pennsylvania coals at the present time.

In the face of probable labor troubles in the union districts, there is apparently very little interest here among buyers. The majority of steam-users feel their reserves are ample for the present.

By water especially there has been a falling off in receipts and there is a disposition among factors here to clean up what coal is coming forward before trying to do much advance selling.

Prices on Navy acceptable grades at Norfolk and Newport News are on a basis of $4.60@$4.75 per gross ton f.o.b. vessel, with Pool 2 selling for 15c.@25c. less. On cars Boston, quotations are reasonably firm at $6.35@$6.50 per gross ton, although there are beginning to be lower prices for deliveries two or three weeks hence, based on modified vessel freights.

Steamers that were commanding $1.25, Hampton Roads to Boston, a fortnight ago are now to be had for a succession of trips at $1.10, while charters for one trip at a time are likely soon to be on the same basis. Barges, 2,500 tons upward, are being held at $1.25, but trade opinion inclines to a somewhat lower figure soon.

Occasionally there are low prices made on coals from central Pennsylvania, but to all points accessible to the smokeless grades the latter continue to dominate the market. Even at $1 from Philadelphia by water the advantage is still with the Pocahontas and New River agencies, except in a very restricted area not too far east of the Hudson River.

Anthracite

Domestic Demand Follows Weather; Steam Coals Active

Householders and Retailers Keep Stocks at Minimum, Expecting Price Drop—Independent Steam Prices on Level with Company — Output Declines Slightly.

DOMESTIC demand for anthracite is purely a weather proposition. Neither householder nor retailer wants much coal on hand for the new coal year, as the probable price drop in the future is no incentive to stocking over the dull season. The exception to this is in New England, where retailers are now extending their reserves to cover the month of May.

Steam coals are still active and independent quotations parallel the range of company schedules, despite the fact that recent offerings have eased the demand. Production shows only a slight decline in the last week of February.

NEW YORK

Strike warnings seem to have little effect on the majority of coal users. Consumers are showing little interest in the possible scarcity of domestic sizes this summer.

With the exception of pea coal, the producer is not having much trouble in keeping his supply on the move, although the independent miner is not getting more than company schedule for the better grades.

Steam coals show the best movement but are growing in volume because of the reopening of many mines and washeries. Weather conditions have also aided in diminishing the demand. Barley was practically out of the market early in the week but later the supply increased and quotations became easier.

Retail prices in Manhattan and Brooklyn follow:

	Manhattan	Brooklyn
Broken	$12.85	$12.90
Egg	12.85	12.90
Stove	13.10	13.15
Chestnut	13.10	13.15
Pea	10.75	10.90
Buckwheat	7.65	7.80
Rice	6.75	6.80
Barley	5.75	5.80

Prices for domestic coals in Manhattan do not include labor while it is included in the Brooklyn prices.

BALTIMORE

The hard coal business at Baltimore is at a standstill. While the weather has been typically March-like, with some little sleet, the temperatures have not been at all low for the season and the demand for coal is almost nil.

Most of the dealers now figure on merely drifting between now and April 1, or until it is seen whether there is to be a strike in the hard coal fields and how effective it is likely to be if it does come. The comparatively few dealers here who have any considerable stocks on hand in yards and who have figured a loss thereon through a spring cut in price, are now looking forward to being classed as the fortunate ones if the strike comes on and movement is interrupted.

The experience of the past season, in which Baltimore entered the fall period with a shortage of 120,000 tons and yet went through without trouble, although the season was unusually mild, has convinced the dealers that they will be able to get along pretty well even if the strike holds out for two or three months.

BOSTON

Buying has improved notably the past fortnight, due partly to seasonable weather but more largely to the expected suspension. Retail dealers who were saying a month ago they would plan to have enough on hand March 31 to meet ordinary April requirements are now extending that to cover the whole of May.

Certain of the producing companies have already such an accumulation of boats at New York loading piers that they will hardly be able to clear them until the latter part of the month. As yet this is not general, but there is reason to expect enough business for the balance of the month to keep collieries running on full time.

On all-rail much the same conditions prevail. The accent is on chestnut, but egg and stove are now also in active demand, as well as most of the steam sizes.

ANTHRACITE FIELDS

Severe storms during the past week stimulated demand and the market has been further aided by the approach of the strike period. Owing to the lateness of the date set for a conference between producers and miners it seems hardly possible that any agreement can be reached by April 1.

A reduction in price must be effected unless operators are to lose much of their trade. No one, outside of the union, professes to believe that the outcome of the strike could result in higher wages.

PHILADELPHIA

Ordinary March weather has been sufficient to keep up a fair ordering on the part of the consumer. Dealers continue to order more or less freely of the large sizes, particularly stove and nut. Despite all efforts to move pea, it remains positively flat, and the independents with the lowest prices get such business as is offering.

Retailers are much puzzled as to the outlook for April 1. As they believe the operators are in earnest in making a fight for lower prices, they hesitate to carry a heavy stock. A group of retailers discussing the possible reduction in case of a settlement by April 1, agreed that it might be $1, being made up of 50c. for the usual spring cut, and 50c. because of wage reductions. The public's idea of a reduction is from $2 to $3.

The consumer is in a few instances beginning to take in some coal with the strike in mind, but this is far from being noticeable.

Steam coals are still active, although there has been a slight falling off in the demand for buckwheat. This is quickly shown in the demand for this size from the independent shippers, some of whom were quoting $3@$3.25 last week. Rice is in moderate demand, and barley is active.

Coke

CONNELLSVILLE

The spot furnace coke market, which recently advanced sharply, has failed to stiffen further, if indeed it has entirely held its position. There is no difficulty in picking up at least a few carloads at a time at $3.25, in fairly good grades, while there is no doubt that several operators would blow in ovens at somewhat less than $3.50 if they were assured of business for any length of time.

Foundry coke, however, has experienced an additional advance. Several particularly well-known brands have been selling in the past week at $4.75, while the $4 price on ordinary standard coke has entirely disappeared. Coke that a few weeks ago sold freely at $3.75 is now $4.25.

The Connellsville coal market has lost ground, in sales and inquiry, in the past week, and as to prices, it had not experienced much of an advance. While it was said recently that coke was too cheap in relation to coal, the condition now is that except for a few special grades of coal the coke market is the higher of the two. The market is quotable at $3.25@$3.50 for spot furnace and $4.25@$4.75 for spot foundry.

The *Courier* reports production during the week ended Feb. 25 at 63,460 tons by the furnace ovens, and 42,270 tons by the merchant ovens, a total of 105,730 tons, an increase of 3,140 tons.

UNIONTOWN

Again the coal market has fallen into a dull state following several days of activity caused principally by orders in anticipation of the union strike. While conditions generally in the Connellsville region are showing an improvement daily there is not the spurt in buying that producers expected but they are nevertheless prepared for capacity production if market conditions warrant.

The market took a decided spurt last week but it is now almost back to normal again, as "normalcy" has been termed in the coal business for the last year. Demand is spotty, inquiries few, and orders fewer. There is however, considerable tonnage moving from the region. The market is quotable as follows: Sewickley steam, $1.35@$1.50; Pittsburgh steam, $1.50@$1.70 and by-product $1.70@$1.85.

The spotty condition also has affected the coke trade, there being but a limited demand for prompt delivery tonnage with not more than enough available to fill requirements. The market therefore is comparatively steady although sales are few.

Chicago and Midwest

Steam Market Barely Firm; Storm Aids Domestic Call

Demand Lacks Snap—Industries Probably Will Average 45-Day Supply April 1—Market Reflects Uncertainty of Strike Situation—Separate Settlements Likely.

MIDDLE WESTERN steam markets are at best only firm, even in the face of the approaching strike. Large buyers are leisurely taking coal and there is no snap to the demand. The average industrial bin will not show more than forty-five days' supply on hand April 1. The recent blizzard produced a rush of domestic orders, as low supplies have been the prevailing policy throughout this section.

The market reflects the uncertain strike situation. Separate settlements with the men now seem likely, and the more conservative miners' element apparently recognizes the necessity for wage reductions. The men seem to have made up their minds that after some preliminary operating disturbances a cut is inevitable.

Very inclement weather has led to some demand for coal, but while well defined in some localities, it is nowhere near what was anticipated. Recent blizzards have brought about a certain demand, but car numbers were demanded in practically nine cases out of ten. The dealers are only buying for their immediate needs and do not wish to place orders unless they can receive a car number by return mail, or better.

The market on steam coals is not showing any improvement over last week or the week before that, and in the face of a threatened strike this situation is very hard indeed to realize. Some steam coals are being purchased, but as has been the case all spring, no great rush has been noticed as yet.

The market on domestic coals is very erratic. In some instances operators and distributors having car numbers available, are obtaining a premium for them. Franklin County operators are booked up between now and April 1 on their 6-in. lump and 6 x 3-in. furnace. Small egg is, for the time being, difficult to move and some operators are making concessions to wholesalers. Out in Iowa and in portions of Illinois the demand for high-grade Eastern coals continues strong with prices on block in the vicinity of $2.75 and egg around $2.25. Other prices are quoted in the Weekly Review.

Ideas on the strike subject are very different. No matter how well informed one happens to be, one can always hear reasonable arguments, defending each of the positions set forth above. Some Illinois and Indiana operators, however, have advised their trade to stock up at least thirty to sixty days, but we know of no operator who has cautioned his trade to stock up more than sixty days.

CHICAGO

The entire Chicago coal fraternity is in a state of uncertainty over the coming strike. Sales agents have refused to express themselves in regard to developments after April 1. In the meantime, the market reflects very strongly this uncertain feeling. The demand for domestic is excellent on some days, while on others there is absolutely no demand at all. This is true more or less of the steam situation.

Southern Illinois prepared coals in the larger sizes are holding firm at $3.65. Indiana domestic of the best grade is to be had ranging $3@$3.50, with the demand only fair. A great deal of West Virginia and Kentucky coal is finding a market through, rather than in Chicago, and prices are holding fairly firm on block in the vicinity of $2.50@$2.75. Smokeless coals are to be had in large quantities, with mine run very close to $1.65@$1.75. Every now and then some smokeless coal goes on demurrage and can be picked up at less. Anthracite showed some slight improvement last week, no doubt being brought about by the desire on the part of a small number of retailers to stock up a little before the first of April.

The feeling appears to be that wage settlements will be made by states and districts rather than through any interstate agreement, as has heretofore been the case with the United Mine Workers. It is expected that perhaps Indiana and Illinois will make the same agreement.

The opposition to the check-off in some circles is not as strong as it was some time back. Old-time operators have not forgotten the terrible state of affairs that existed in the Central Competitive Field fifteen or sixteen years ago, when there was no United Mine Workers organization to hold the operators in check and keep them from price-cutting wars which ruined a great many of them. Operators feel that if certain working conditions, wages, etc., were paid to all mine laborers in certain competitive fields, that conditions would be better for all concerned.

Another angle to be taken into consideration is that a great many of the more conservative among the miners realize the trend of times and have already made up their minds to the effect that after some preliminary skirmishes they will have to take a reduction.

SOUTHERN ILLINOIS

Colder weather helped move a little of everything out of the Carterville field last week. Screenings have been going fairly good and all steam coals have shown up better.

Domestic tonnage was figured the early part of the present week to be at its lowest ebb since any time last spring.

Movement is mostly toward Chicago. Railroad tonnage developed rather good the past week.

The Duquoin and Jackson fields are traveling along somewhat on the same lines as the Carterville district, excepting perhaps they are not getting as much work. Prices are a trifle lower here and there. General conditions are far from satisfactory.

The Mt. Olive district has shown up better, with a movement of domestic tonnage to the Northwest and Kansas City. Steam sizes go on contracts. The domestic market seems to be about $3 for all sizes, with screenings at $1.75. Railroad tonnage is heavy.

The Standard situation does not seem to improve. Screenings are in a trifle better demand than any other size. Some mine run is being loaded for railroad. Domestic lump is unusually slow, while some steam lump is being loaded for storage. Considerable dissatisfaction is expressed in this field by miners over the unsatisfactory working time.

ST. LOUIS

Domestic business spurted some last week on account of the cold weather. Demand is mostly for small loads and cheaper grades.

Very little anthracite or smokeless is moving, while coke has shown up well, principally on account of talk of enforcement of the smoke ordinance.

General conditions are not satisfactory. No dealers anticipate putting in any great supply of domestic coal but the larger dealers are protecting contracts by storing a sixty-day supply of steam sizes.

Movement to Chicago is fairly good on Standard steam sizes. Retail prices are unchanged.

WESTERN KENTUCKY

There has been a slump in demand for all grades during the past week. Many of the large industrial concerns have stocked up, and other buyers lack confidence that there will be a strike or that prices will be any higher. The weakness alleged to be shown by the miners' unions is resulting in many buyers deciding that they will take a chance on short supplies.

Lump coal is very slow, and movement of mine run not heavy. While prices of screenings are being well maintained, it is largely due to the small production, rather than heavy demand. Mines are operating two to three days a week in most instances, and there is a continued shortage of screenings, resulting in their commanding a mine run price at the present time. Both mine run and screenings are selling $1.65@$2.

LOUISVILLE

Lump coal is a shade weaker than it has been, especially the grades that are not quite up to standard quality. Mine run is firm and screenings are holding even, there having been a slight reduction in western Kentucky screenings over the week. Car supply is ample and there is plenty of labor. The principal difficulty is securing orders for lump in order to make screenings.

It is believed that there may be a lull in the heavy demand that has been experienced for steam coal. Reserves are growing and the present increased demand is not for current consumption.

Retaliers are reporting a little call for immediate use, but no early stocking demand is in prospect. However, they are not buying lump coal, as they are very anxious to reduce stocks in hand.

Northwest

Rush Orders and Threat of Shortage Follow Blizzard

Paralysis of Transportation Scares Dealers Carrying Meager Stocks—Docks Behind on Orders—Screenings Scarce, Price Advances — Industrial Situation Improves Slightly.

A SEVERE blizzard paralyzed Northwestern transportation systems last week and brought dock companies a flood of rush orders. Some country dealers are in a precarious situation as a result of carrying very meager stocks. Docks are behind in their orders. The growing scarcity of screenings has caused a price advance.

The industrial situation is showing only slight signs of improvement. There is not much reserve buying against the strike, although consumer interest is growing. However, the philosophy of letting tomorrow care for itself still prevails with most buyers.

MINNEAPOLIS

The worst storm in a number of years prostrated traffic in much of the entire Northwest during the past week. This stopped freight movement, and it took the docks several days to get back into operation. A portion of the district adjacent to the Great Lakes in northern Wisconsin was so badly tied up as to be threatened with a suspension of industry through inability to get coal moved.

The Head-of-the-Lakes and the Iron Range country probably had the worst of the storm, but the Twin Cities were practically without train service for twenty-four hours. Many passenger trains were annulled. Such trains as attempted to make their regular runs were hours late.

Following the storm came severe weather. All this must of necessity, mean a decided increase in consumption. Wholesalers have been unable to see much increase in their own sales, and have felt that the severe weather would merely reduce the amount held in consumers' bins at the close of the winter. But the prolonged severe weather is certain to compel additional buying, and a reduction of the stocks on hand at all points.

Consumers assuredly will not carry over as they did a year ago. But the present indications are that they must buy more coal, regardless of how they attempt to confine their purchases.

So far as the probable strike is concerned, it has no particular effect upon buying in this district. Buyers probably do not deny the certainty of a suspension, but they are more interested in deferring purchases as long as possible than they are in what may happen when the shut-down occurs.

As a result, there is no particular strength to the market. The prices of a month ago, when a cut of $1 on dock coals was made, are usually prevailing. One or two concerns advanced their costs 50c. shortly after the cut, but they were not followed by others. There seems to be no ground for expecting any immediate bracing to the market, despite the outlook.

And the outlook is not regarded as certain to result in a suspension. The press has frequent articles to the effect that the administration will seek to bring about an adjustment of the difficulties. So in this section few coal buyers seem to be worrying much as to the effect of a strike. If it does not endure for more than six weeks, there will be ample coal carried over to fill all needs that could possibly develop.

MILWAUKEE

The market is almost at a standstill because of a series of cold waves and storms, which wrecked communications and isolated the greater part of the state. Little coal is moving out, and country dealers who may be short of supplies will have to wait until things clear up.

A drop of $2 in the price of both Solvay and gas coke last week was caused by a desire to get rid of a heavy stock before navigation opens. Egg and nut Solvay now retails for $13, and pea coke at $10. Gas coke can be had at $11.50 for egg and nut, and $9.50 for small nut.

Coal prices are firmly held. There is still a scarcity of soft coal screenings, and it is evident that consumers of this grade of coal may have to resort to something else unless the situation changes soon.

DULUTH

An advance of 50c. a ton in soft coal has come about, together with the recent blizzard which thoroughly tied up the Northwest. This means a total advance of $1 within the last month and a half.

Storm conditions have been so bad that it has been impossible to ship much coal from the docks. Only enough has been sent through to keep public service corporations and municipal heating plants running.

Present prices on Youghiogheny, Hocking and Splint lump is $7, run of pile, $6.50; and screenings $4.50@$4.75.

Owing to a decrease in freight rates on screenings to Minneapolis and St. Paul dock stocks are virtually cleaned up. Barely enough remains to take care of local markets. Industrial demand from Twin Cities is better.

Retail trade orders in Duluth are booked from ten days to two weeks ahead, and it has been impossible even to get stocks around the city because of the deep snow.

Country dealers are calling in vain for anthracite with which to satisfy the demands of their customers who waited until the storm broke before ordering. Cars for country shipments cannot be brought into the Duluth docks except in one or two places, as snow drifts from ten to twenty feet high impede. Prices on hard coal remain firm. Egg is $12.50; stove, $12.80; nut, $12.75; pea, $10.80, and buckwheat, $6.

Canada

TORONTO

The coal situation here has not so far been noticenbly affected by the threatened strike. There appears to be little disposition to lay in bituminous stocks. It is evident, however, that when the supply now on the tracks is disposed of the market will be considerably firmer as coal cannot then be got at present prices. Demand for anthracite has lately been stimulated by severe cold weather, but the call for bituminous continues sluggish.

Quotations are as follows:

Retail—	
Anthracite, egg, stove and nut	$15.50
Pea	14.00
Bituminous steam	9.25@9.75
Domestic lump	11.25
Cannel	16.00
Wholesale, f.o.b. cars at destination—	
¾ in. lump	7.00@7.75
Slack	6.00@6.75

South

BIRMINGHAM

If anything, steam demand in the spot market has been somewhat softer the past week. Inquiry has been slack and very little new business was taken on by commercial mines. There is little activity in the bunker coal market, requirements being lighter than before for some weeks.

The same situation obtains in the domestic market. Unfavorable weather conditions continue to prevail. Winter has been so long delayed that retailers will, as a rule, not have to get into the market again this year, having ample stocks to run them, and orders for a few cars here and there constitute the only outlet for current production.

The railroads have again slightly increased the tonnage being taken on contracts and this is proving a boon to operations which are lucky enough to hold such agreements, and is the backbone of the movement from the commercial field. Furnace company mines are also producing a slightly increased tonnage as new stacks are being lighted, requiring a heavy output of coke and coal for company use.

Mine prices on steam and domestic coals have shown no change over a week ago, the range of prices then given being representative of the present market.

VIRGINIA

Mines are producing about 57 per cent of potential capacity. The output is heaviest on the line of the C. C. & O. where it is almost 80 per cent of capacity. In general the smaller mines are not operating, owing to low prices. The bulk of the output is on contract, but there is a little demand for steam coal, the call for prepared having undergone a slight decrease. Prices are undergoing no change.

Not more than 6,000 tons of coal per week are being converted into coke.

Eastern Inland

Strike Impetus Is Fading; Non-Union Fields Relied on

Unorganized Producers Still Active, but Prices Cease Upward Course—Stocks Probably Large—Domestic Business Fluctuates with Weather—Pre-Season Lake Shipments Meager.

THE temporary impetus given to the market by the approach of the strike date has lost much of its insistence. Non-union producers are still active, but there has been a check to the upward trend of their prices. The inference is that stocks are considerable. With the exception of railroads and public utilities, who are shopping around, the consumer shows an indifferent attitude to strike talk, secure in the belief that his requirements over present reserves will be amply protected after April 1 by the non-union operations.

Domestic coal is finding a weather market only, orders fluctuating with the severity of the temperature. The present year so far registers the smallest volume of pre-season shipment of Lake coal on record.

CLEVELAND

With less than a month remaining before the strike, the market continues a puzzle to sellers and operators. More coal is moving, inquiries are more numerous, but no keen desire to stock supplies is manifest outside of railroads and public utilities. The last two weeks of grace may serve to spur consumers into action, but many operators doubt if the buying movement looked for a few months ago will develop.

The average industrial user has a feeling that the strike, if it comes, will be neither long nor disastrous. He has a hunch he will be able to get non-union coal if a prolonged shutdown comes. That the subject is on his mind, however, is evident from the growing number of inquiries.

These inquiries and the larger number of sales are logical developments as a result of the better industrial activity in this district. They would have come to some extent at least had no hint of a strike appeared. The most important industries in Cleveland and other nearby points include metals, automobiles and parts. Iron and steel mill operations are at the highest rate of activity since December, 1920. Automobile output is growing as is that of parts. Present indications point to general industrial improvement in the spring. The one factor which may check the rate of improvement will be a shortage of coal.

Retailers report that householders are buying in small lots to piece out the season. Receipts of bituminous coal during the week ended Feb. 18 were the largest for any week during the past twelve months, save one. Total number of cars received were 2,062. The week ended Feb. 25 shows a decrease of some 300 cars; divided, 1,404 to industries and 355 to retailers.

EASTERN OHIO

Output amounted to 322,000 tons during the week ended Feb. 25, or approximately 64 per cent of potential capacity for the five work days, Feb. 22 being a holiday. Production showed a daily average of 64,400 tons as against 62,000 tons during the previous week.

Association mines worked about 50 per cent of full time and produced about the same rate of capacity as that shown for the district. During the same week last year, this field produced 224,000 tons or at the rate of 44 per cent capacity, notwithstanding that pre-season shipping of Lake coal was well under way. The present year so far registers the smallest volume of pre-season shipment of Lake coal on record.

It is freely predicted that as soon as the Lake season gets under way this year, a shortage will develop rapidly in open-top cars, as this class of equipment is used most heavily in this region during the Lake season for hauling coal to the docks, and iron ore from the docks to furnaces. This assertion is upon the premise that the railroads have more "bad-order" cars on track at this time than ever before, and that they cannot get them repaired because of no funds or other adverse circumstances, therefore, with any appreciable upturn in general business, combined with the requirements for empty cars in Lake coal shipping, will inevitably evolve car shortages perhaps more serious than those usually experienced.

A summary of industrial conditions throughout this section during the past week reveals an upward movement in the iron and steel business of a more permanent character. Another outstanding feature is the gradual but steady increase in railroad traffic. Considerable optimism also prevails as to the impetus which will be given to business in the not far distant future when downward adjustments in both wages and railroad rates on basic commodities become a reality, principal among which is coal.

While the demand for coal has not assumed the proportions expected a few weeks ago, spot prices are holding firm with practically no change in the figures quoted last week.

PITTSBURGH

Inquiry for coal in this general district has fallen off rather sharply in the past week. The turnover in union-mined coal remains light as for a long time past, while Connellsville and other non-union coals are moving a trifle less freely. Prices have not definitely declined but have quite failed to score the advances that were expected. Connellsville steam coal is quotable at $1.50 @$1.60 for mine run, or substantially as low as the open market has been, the main difference being that the distress sales of a month and more ago have disappeared.

As the price is well below anything the unionized mines can do, there is not much concrete evidence of a shortage of coal after April 1 being expected. With the materially increased production of the past few weeks there has already been a considerable volume of stocking.

There are no fresh developments of consequence in labor matters. The position of the Pittsburgh district operators is simply that they have formulated a wage scale which they will discuss if desired with the local organization of the U. M. W., while they will not rejoin the Central Competitive Field for negotiations.

The market, made up largely of asking prices, remains unchanged.

DETROIT

Consumers are not coming into the market as actively as jobbers feel they should to make adequate provision for continuance of their fuel supply. There is no urgent demand for shipments.

Non-union have practically forced out of the market the coal from union mines, except for small shipments that apply on long-time contracts. The situation seems to support a theory that the steam coal buyers are depending on continuance of shipments from the unorganized territory, instead of building up reserves.

While the amount of bituminous sent to Detroit is not large, it is usually not difficult to find a few cars of free coal somewhere about town. Spot prices are firm at former levels.

NORTHERN PANHANDLE

Railroads continue to secure the bulk of the output, although inquiries are becoming more numerous owing to the probability of a strike. As a result of the additional demand shipments of steam coal are on a little larger scale, but as a rule most mines producing commercial fuel are marking time. Improvement is more noticeable at mines where there has been an adjustment of wages than at others.

COLUMBUS

Large users are taking advantage of the advanced knowledge of the mining situation and are buying gradually for stocking purposes. This is causing a better tone to the market.

Mine run is probably the strongest feature. Screenings are growing weaker with the exception of Hocking, where the production of lump is being reduced. The mild weather has not helped the domestic situation and retailers are gradually cleaning up for the spring season.

Hocking lump sells around $5.75@ $6.25 and West Virginia splints, $6.50 @$7.25. Pocahontas is $8.75@$9.25 with demand fairly good.

Public utilities are the most active buyers in the market at present. Railroads are also more liberal in their orders. A large part of the stocks being bought, however, come from West Virginia and Kentucky mines, because of the cheaper quotations. Ohio districts are not benefitting to any great extent.

The Hocking Valley is showing an output of between 22 and 25 per cent and the same figures are reported from Cambridge, Pomeroy Bend and Crooksville.

Cincinnati Gateway

Offerings Exceed Demand; Weakening of Prices Results

Topheaviness Has Usual Sequel—High Volatile Fines a Possible Exception——Domestic Buyers Grow More Cautious—Output in Southeastern Kentucky Gets Stimulus.

WEAKER prices have followed a topheavy market, as offerings are in excess of current demand. High-volatile fines are a possible exception to this. The end of the domestic season shows an increasingly cautious buying policy, as no one wants much of a carry-over on April 1.

Production in southeastern Kentucky has been greatly stimulated by heavier shipments from industrial-owned operations. In the Kanawha field more mine resumptions on lowered wage scales have been observed.

CINCINNATI

Utilities and heavy steam users are in the market but they are disposed to shop around rather than buy without question. Other consumers are now buying sparingly. During the fore part of last week some of the West Virginia and southeastern Kentucky producers attempted to shove the price of nut and slack to the high figure of mine run. However, the buyers were disposed to go up to $1.25 for top-grade nut and slack, but no more. Most of the sales were made a dime lower. Kentucky mine run was weak and West Virginia lower than for some weeks past.

The bottom has dropped out of the domestic demand and splints are reduced 25c@50c. Good gas block is under $2.

Smokeless operators still claim to be behind in their orders, but there are cars standing at the scales awaiting shipping directions. Mine run holds to the set price but is weak underneath. Screenings are hard to move and while quotations are still at the old figures there has been a quantity of this sold under $1.

Retail business perked up a little, due to colder weather, although deliveries were of small tonnage. Prices quoted were: Smokeless lump, $8; nut, $7.50; mine run, $6.50@$6.75; slack, $5. Bituminous lump, $6.50@$6.75; mine run, $5.75; slack, $4.75@$5.

HIGH-VOLATILE FIELDS

KANAWHA

What little increase there was in production during the closing days of February was due to an adjustment of wages at a few mines, with a prospect that some of the larger concerns would also resume operation on a like basis. Producers have virtually served notice that the present wage scale will not be continued after April 1. Steam coal has nosed out domestic in point of demand. Slack is growing scarce owing to the limited amount of coal prepared.

LOGAN AND THACKER

Although there has been a marked increase in the Logan production, with shipments amounting to about 80 per cent of capacity, yet there has been little or no change in price. Steam is the source of more inquiry than any other grade.

In the Williamson field production is twice as large as it was during the corresponding period of 1921, the output now approximating 125,000 tons. Much of the coal is flowing to Western markets in response to a somewhat heavier steam demand. Railroads are gradually increasing their requirements.

NORTHEASTERN KENTUCKY

Fear of a strike is undoubtedly contributing much to the increased shipment, which now amounts to about 52 per cent of capacity—a larger tonnage produced than at any time in the last year. There is a little better demand for steam fuel aside from the possibility of a strike. Domestic grades are not in so strong a position, owing to warmer weather.

SOUTHEASTERN KENTUCKY

Harlan County produced the largest tonnage in its history in January, and estimates for February show slight increases over this. The major portion of this increase is in contract takings and a larger output of industrial-owned concerns who are stocking up for the strike. There is better demand for screenings and mine run. The former is rapidly growing scarce and prices are up.

Call for domestic is at a minimum, but there is a slight increase from public utilities for 2-in. lump and egg.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

New River mines are only working two or three days a week. More mine run is being handled, some of it for storage purposes, but at no advance in price. Although Tidewater shipments are fairly large in volume, the textile strike in New England has affected shipments.

Winding-Gulf is maintaining four days per week in its loading average and at some operations labor shortage is commencing to develop. Demand has stiffened to some extent but there has been no appreciable strengthening of prices.

POCAHONTAS AND TUG RIVER

Pocahontas production is still climbing upward, the average weekly output being about 325,000 tons. There is a fairly active demand principally for steam coal for storage purposes, but there is also a somewhat better demand due to increased industrial activity. Prepared is not quite so strong, owing to moderate weather conditions.

Tug River production is heavier as the result of an increased steam demand. The output averages more than 100,000 tons a week, with a car shortage retarding the output to some extent. The Norfolk & Western has succeeded in borrowing open-tops from another road, however, and is relieving the shortage to some extent.

West

SALT LAKE CITY

Despite the fact that the weather is quite mild dealers report that business is still "good." Some difficulty is being experienced in getting the larger sizes.

Opinions differ regarding the possibility of a general strike in this field. In some quarters it is declared that a strike is bound to come and in others that as Utah is not tied up with the miners' national organization we shall have very little trouble, especially as the Utah mines are working so far below their capacity as a result of market conditions.

DENVER

Five hundred Weld County miners are on strike and eight lignite mines are closed as the result of some of the miners' refusal to accept a 30 per cent wage cut similar to that in the bituminous fields. The reduction brings wages back to the 1917 scale.

There has been no violence and no request for help has been made to the state authorities. Notice of the wage cut, which was authorized by the industrial commission, was posted at the Puritan mine. Company officials said that owing to light demand for coal it might be several weeks before an attempt would be made to resume operations.

Except for the disturbance in the northern lignite fields, Colorado's output is gradually getting back to normal. Slack is still weak, but cold weather is gradually straightening out the undercutting of prices. Lignite steam is $3.20, while lignite lump is $4.

Bituminous lump is $5 at the mine against $6 a year ago. Slack is $2.50 at the mine, while Walsenburg and Routt steam bring $2 and retail for $5.45.

KANSAS CITY

The only big snow storm of the winter visited this section last week. The temperature hovered around zero all week and dealers were rushed to care for the orders that poured in. The railroads were hampered by the snow and train service was impaired. There was no material change in prices and as coal for storage has generally been put in the demand for steam has not kept pace with the domestic grades.

The Southwest is in a peculiar position; if Howat regains his power—and some doubt if he has lost it—it will mean the same old strife, and if a mining scale is made with the regular organization there is some doubt if it would enable the Southwest to compete with the thicker coal seams east of the Mississippi and the Colorado fields.

News Items From Field and Trade

ALABAMA

J. J. Forbes, coal-mining engineer of the Bureau of Mines, is collecting data for the preparation of a bulletin on sampling and analyses of Alabama coals. This bulletin will give information regarding the coals of the Birmingham district. One hundred and forty-nine face samples of coal have been taken in thirty-four mines in Alabama, representing fourteen different coal beds.

ILLINOIS

The Perry County Coal Corporation, Coulterville, has filed notice of change of name to the **Perry Coal Co.**, at the same time increasing its capital from $255,000 to $1,250,000 for proposed expansion.

The mine at Ward has been unsealed by Robert M. Medill, Director of Department of Mines of Illinois. It is also understood that the property has been transferred from W. A. Perrin of Herrin, who had it on lease, to the **Aladdin Coal Co.**, of St. Louis, which operates mines at Tamaroa, Pickneyville and Cutler. The fire at the Ward Mine has been extinguished.

James Walker, formerly county mine inspector, is sinking a new mine for local capital on the Turner farm at Crab Orchard in Williamson County. New homes on the property are planned for the miners.

Peabody Mine No. 3 broke the Williamson County record for one month, in December, with 75,850 tons of coal. The mine is twenty-two years old, which is a record for a mine of that age and size in these particular times.

In one day in January Mine No. 1 of the **Bell & Zoller Coal Co.** broke its previous record of coal hoisted. It had a 45-minute interruption that day and came within 34 tons of the world record made by the Orient Mine, a few miles away. The first record was made with an interruption of only 4 minutes. Could the Zeigler Mine No. 1 have the 41 minutes which the Orient Mine had they would not only have broken the world record but would have set a mark that it would have been a difficult matter for any mine to pass. The total hoist on this day was 6,716 tons in 7 hours and 15 minutes, while the world record is 6,750 tons in 7 hours and 56 minutes. Franklin County now has the two largest producing mines in the world.

Fire which raged in the Union Mine of the **LaSalle County Carbon Coal Co.**, caused the loss of twenty-four mules, as well as destroying a greater part of the interior structure of the mine before it was put under control.

The American Coke & Chemical Co., of Chicago, has purchased 5,600 acres of undeveloped coal land in South Twigg township near McCleansboro. This move is taken to be the opening wedge of much development work in that district.

Fred Harwood, traffic manager of the Illinois Coal Traffic Bureau, has gone to California for his health.

Leo Romanski of the Atlas Coal & Coke Co., Chicago, is on an extended vacation in the South.

Work has been resumed at the mine of the **Illinois Sixth Vein Coal Co.**, at Pinckneyville, after having been closed down for some months. The affairs of the company are now in court and the mine is being operated by a receiver appointed by the Illinois District Court.

Destitution is rampant among the miners in southern Illinois. With almost one-half the mines in the Williamson and Franklin fields idle and others working only half time, thousands of families have next to nothing to eat, have little to wear, and have no credit at the company stores, and are even unable to arrange for fuel. Some relief has been offered by the cancelation of the miners' assessment through some locals where the working time is next to nothing. Committees of miners are soliciting aid from the public in the interest of sufferers.

E. J. Scott of St. Louis, president of the Scott, Smith & White Coal Co., was in Duquoin recently, on an inspection tour of the strip mine which that company has in operation at that place.

Following the course of many coal mining concerns in the state, the **United Electric Coal Co.** has sent a letter to each of its employees near Danville telling them that they would by necessity have to take a reduction in wages April 1. The letter explained that this was essential in the operation of their mines for with the present wages they could not compete with the mines in Alabama, Kentucky and Virginia. The Old Ben Coal Corporation and other large operating companies have recently sent similar letters to employees.

Major William R. Coyle, president of the American Wholesale Coal Association, was the guest of honor recently at a luncheon tendered by the Chicago Wholesale Coal Shippers' Association, in the Fraternity Room of the Great Northern Hotel.

The Price Mine near Rock Island, it is understood, will be closed and abandoned. The vein of coal has been practically exhausted in the last fourteen years.

INDIANA

The Wizard Coal Co. of Terre Haute, recently filed a final certificate of dissolution at the secretary of state's office.

Arrangements are being completed for the opening of the first commercial coal mine near Shoals. The mine will be about three miles east of Shoals and will be operated by electricity.

KANSAS

The Central Coal & Coke Co., has acquired leases on 10,000 acres and is reported to be figuring on a total of 50,000 acres of coal bordering on both sides of the Kansas-Oklahoma line. Other leases have been taken at $35 per acre. The center of the new field, as it is outlined now by prospectors, lies about 20 miles southeast of Edna, Kan.

KENTUCKY

Clerk Menzies of the United States District Court in Covington recently returned from a visit to Bell County, where he went to arrange the sale of the **Cumberland Railway** to satisfy a lien held by the Guaranty Trust o., of New York City. The railway is said to be worth about $50,000 and is the only outlet of several mines that have been opened on it.

Fred M. Sackett, of the Byrne & Speed Coal Co., a large operator of Kentucky, is one of the backers of a movement for the formation of a Kentucky Club of the Old Colony Club, Mr. Sackett being a member of the advisory board of the national body. Club rooms are to be installed in the Seelbach Hotel, Louisville.

George Vankirk, of the **American Coal & Feed Co.**, has filed notice with the Jefferson County Clerk, in which he affirms ownership of the concern.

Chief of Detectives William DeForester, Louisville, has sent out a warning relative to checks made out by a cold check artist, operating as the **Long Branch Coal Co.**, of Earlington. There is no such concern, but a number of such checks have been passed in the state.

The Service Fuel Co., Greenville, capital $100,000, has been chartered by A. D. and Carlisle Kirkpatrick and J. L. Rogers.

Passing on preliminary motions in a suit of the **Harlan Coal Co.** against the **Wheeler Coal Co.**, operating mines in Lee and other counties of eastern Kentucky, a Louisville judge recently sustained a demurrer to that part of the petition by which the Harlan company sought to recover $230,400 in commissions and allowed to remain in the petition that part by which the plaintiff seeks to recover $58,000 in commissions. The larger amount was a claim for commissions for selling coal not yet mined and which may be produced by others than the Wheeler company.

MINNESOTA

The Great Lakes Coal & Dock Co., of Minneapolis, has increased its capital stock from $800,000 to $900,000, in a recent amendment to its articles of incorporation.

Stanley B. Houck, counsel for the Twin City Coal Exchange, Minneapolis, has returned from a trip to Washington, where he conferred with national coal men, on the prospects for the spring.

The Minneapolis Atomized Fuel Co. has filed articles of incorporation with $100,000 capital stock. G. H. Reeves, a well-known coal man, Simon Kruse, proprietor of the Radisson Hotel, Will C. Brown and Frank Boutin are incorporators.

MISSOURI

The strike recently called by the Howatt board at the mine of the **United States Coal Co.**, Alston, proved a fizzle. Five men quit and others were on hand to take their places. Howatt claimed the mine had violated the contract by discharging several men.

G. E. Hildebrand, of Kansas City, is reported to have acquired the 1,421-acre tract known as the Swift Ranch near Paris, for $70,000. Coal was previously mined on the tract but operations are reported under way for a big mine production later.

NEW YORK

The Coal Trade Club of New York held a luncheon on March 1 at the Whitehall Club, New York City, about 75 coal men being present. The members were addressed by Douglas MacArthur, manager of the Seaboard By-Products Co., who described the manufacture of byproduct coke. Mr. MacArthur stressed the need of higher quality coal for this section and urged greater familiarity of salesmen with the product they handle. Mr. Hermann, chairman, recommended the formation of an exchange to draw up a "Code of Ethics" to be observed by members in their coal transactions. This idea met with the club's disapproval, the members feeling that their experiences in the past with associations and exchanges were not such as to recommend the idea of a new organization. The club holds a luncheon on the first and third Wednesday of each month.

Dr. Henry M. Payne left last week to look after some professional work in Idaho. He will also spend a few days in the California oilfields. En route he will fill his annual engagements as non-resident lecturer at several of the mining schools and universities, returning to New York about April 1.

The Buffalo Wholesale Coal Association held its annual banquet on Feb. 20, with about 65 present, including guests from Pittsburgh and Toronto.

OHIO

By an arrangement effected by the **Darby Coal Mining Co.** and the **United Fuel & Iron Co.**, a joint selling company has been established under the name of the **Darby-Old Virginia Coal Co.** A new office has been opened in Spartanburg, N. C., and other offices already established are in Pittsburgh, St. Charles, Va., and Cincinnati. The latter will continue under the style of the Darby Coal Sales Co.

Upon the application of Arthur N. Quillin, vice president and director of the company, Judge Scarlett has named Smith W. Comley receiver for the **Broad Run Coal Co.**, Columbus, under a bond of $10,000.

Governor Harry L. Davis and Percy Tetlow, state director of industrial relations recently went to Nelsonville to make an investigation of conditions among the miners of Athens County with a view of giving relief. A meeting of representatives of townships and various municipalities was called to hear reports from all sections.

The Griffing Co. has been incorporated with a capital of $200,000 to deal in coal stocks. William F. Griffing, the head of the company is selling the stock of the W. E. Deegans Coal Co., of Huntington, W. Va. Incorporators of the company are William F. Griffing, R. E. Greiss, M. K. McGaughy, and C. B. Wolfe.

The Young Ice & Coal Co., Cleveland has been chartered with a capital of $25,000 to retail coal by R. H. Riffe, James W. Iurk, Golden B. Boyd, James A. Clinton and L. P. Smith.

The Colonial Fuel Co., Columbus, chartered recently with a capital of $25,000 will operate a retail yard, taking over the business formerly conducted by the Colonial Coal & Supply Co., Walter H. Plant is president and general manager.

It is rumored that negotiations are under way for the purchase of the holdings of the **Lorain Coal & Dock Co.**, with headquarters at Columbus, by the **Consolidation Coal Co.**

P. O. McIntire, formerly president of the P. O. McIntire Coal Co., is now vice-president of the Astel Coal Co. Headquarters are in Cleveland.

Fred Saal has been appointed manager of the Lake shipping and fuel department of the Pittsburgh Coal Co., with offices in Cleveland.

The State Director of Industrial Relations, who is at the head of the Ohio Mining Department, reports an improvement in the mining situation in the State during the past few weeks. A part of this improvement is attributed to the appeal of Governor Harry L. Davis to Ohio people to use Ohio-mined coal in all cases.

Presenting claims aggregating $12,983.47, W. H. Warner & Co., the H. W. Jenkins Coal Co., the John M. Taylor Coal Co. and the Gibralter Coal & Coke Co., all Columbus concerns, filed suit in Federal Court recently, asking that the **Elks Coal & Coke Co.** be adjudged a bankrupt. Don Hamilton was appointed receiver for the company.

Abandoning its Kentucky charter because of taxation and other oppressive features the **Logan & Kanawha Coal Co.** has re-incorporated under the Ohio Laws with a capitalization of $100,000. F. E. Legg, S. E. Legg, W. I. Donnelley, S. E. Stewart and E. P. Measham are named as the incorporators.

Joseph Briscoe, last year's president of the Cincinnati Coal Exchange has resigned as the manager of the coal sales department of Eaton Rhodes & Co. **J. L. Crosgy, Jr.**, head of the domestic coal sales department and **L. Bersinger** also have resigned.

OKLAHOMA

The Peabody Coal Co., of Chicago, has opened an Oklahoma City office with T. L. Rooks, formerly with the Kansas City office, in charge, to handle semi-anthracite and bituminous coals.

A new mining town has been opened up 19 miles southeast of Nowata, known as Gunther. The owner, **A. C. Gunther**, is sinking a big mine and building up the town.

The Frisco R.R. is reported to be surveying a line from Vinita through a new coal field near Bluejacket, which may eventually end at Pittsburg, Kan.

The old strip mines near Oolagah, Rogers County, are to be opened again soon. It is said that the advancing costs of natural gas for fuel purposes in industrial plants is such that operation of the coal mines will be found profitable in furnishing coal for such uses.

The Messine Coal Co., of Haileyville, has increased its capital stock from $25,000 to $75,000 and an amendment has been filed with the secretary of state at Oklahoma City making this change in its articles of incorporation.

PENNSYLVANIA

The Upper Hillville Mine at West Monterey, has been sold to the **Jo Ann Coal Co.**, Pittsburgh, together with 400 acres of coal land. The property was formerly owned by Frank Williams & Co., Buffalo, and operated by that concern about eleven years. After the failure of the company, the receiver sold the property, the buyer being C. L. Stevens, of Pittsburgh.

The Auditor General's Department believes that within the next sixty days state coal tax payments will begin arriving at Harrisburg. The department is taking steps to secure settlements on amounts of taxes due by the anthracite producing companies, under the reports now on file. A few small payments of tax have been made by minor companies. The larger producers have filed reports and the department will ascertain from them what amounts of tax are due. The question of the constitutionality of the anthracite tax law will be argued in Philadelphia in April if the paper books are prepared in time for the State Supreme Court to fix a date for that month and if the case cannot be heard then it will be placed on the list for argument at Harrisburg in May.

A mine cave, resulting from robbing of pillars in the big vein of the Beaver Meadow colliery of the **Lehigh Valley Coal Co.**, recently dropped a considerable area of land between Leviston and Coleraine. It is estimated that the surface went down from 18 in. to 5 ft. by the subsidence.

The Pittsburgh Testing Laboratory announced, at its recent annual meeting, the retirement of its president, **George H. Clapp**, his reappointment as a member of the board of directors of the company, and the election of **Colonel James Milliken** to the presidency.

Notwithstanding the industrial depression, strikes and other impediments to the coal business, the annual report of the inspector of the **Thirteenth Bituminous Inspection District** shows that the gross production of the mines in the district fell off only about one-fourth during the past year. The district comprises 107 mines normally, but during the period covered by the report only 93 were in operation, 14 remaining idle throughout the year. Total production in 1920 was 4,500,000 tons, or approximately 1,000,000 tons more than in 1921. During 1921 five new mines were opened and two old tipples were abandoned.

The coroner's jury who investigated the death of 25 miners in the Gates Mine disaster of the **H. C. Frick Coke Co.** found that their deaths were accidental and resulted from a blown-out shot, exonerating the Frick company.

The American Coke Corporation has fired up 50 out of 240 ovens at the Martin plant, which has been entirely idle for several months. It has also fired 20 additional ovens at the Orient plant, making 171 of 450 ovens at that plant now in blast.

The Pennsylvania State Supreme Court has overruled the assignments of error and affirmed the judgment of the Common Pleas Court of Indiana County in the case of Carrie S. Kelly vs. **Watson Coal Co.** The opinion holds that the evidence shows that the husband of the claimant met his death through an accident while at work for the defendant company. The board allowed the compensation and the lower court affirmed its decision, the court rules and adds that "there is no merit in appellant's complaint concerning the alleged incompetency of the testimony."

The Workmen's Compensation Board has dismissed the petition for a review of the compensation agreement, filed by the claimant, Felix Kosnovich, Mt. Carmel, against the **Lehigh Valley Coal Co.** The opinion in the case states that A. E. Lewis, referee, awarded compensation for the loss of the use of the claimant's right leg. The defendant company appealed and the board sustained the referee. The defendant appealed to the court of common pleas of Luzerne County and the court referred the record back to the board, holding that the evidence did not support the finding that the claimant had lost the use of his right leg. The dismissal is made without prejudice to the claimant.

Among notices of increases in capital stock, filed at Harrisburg are the following companies: **Sterling Coal Co.**, $200,000 to $500,000, J. S. W. Holton, president, Philadelphia. **Madeira, Hill & Co.**, $1,500,000 to $1,812,500; P. C. Madeira, president, Philadelphia. **Mason-Adams Coal Co.**, $34,800 to $39,600; J. W. Mason, president, Philadelphia.

Central Pennsylvania loaded 58,508 cars of coal during January, as compared with 52,890 cars for December. The daily average was 2,340 as compared with 2,034. Increased production was particularly noticeable the last week of the month, when the average daily loading amounted to 2,900 cars. Reduced to tons, the output was 3,247,194.

The Hillman Coal & Coke Co. has started producing coal at the Griffin No. 1 plant at Grays Landing, near Masontown, which has been idle since last spring.

The Republic Iron & Steel Co., is operating the Republic mine three days a week, instead of two days as for several weeks past.

Judge **Wilhelm's decision permitting the** lease of the holdings of the estates of John **Gilbert** and **Silas H. Wentz, in the Moore and** Miller, strip and Conrad **Mertz** tracts **of** land near **Gilberton** and Shenandoah Boroughs will mean much to that section, **as** at least 10,000,000 tons will have to be mined within 15 years to comply with the terms of the lease and the extension of the present operation of **Gilberton Colliery** will be but a matter of little time as the workings, etc., can be utilized to work the new areas and take out the coal.

The Mason-Adams Coal Co., a Philadelphia retail house, will increase its capital from $34,800 to $39,600.

The Sterling Coal Co., operating in Cambria County and having headquarters in Philadelphia, will increase its capital stock from $200,000 to $500,000.

H. R. Reinhardt, engineer for Northumberland County, has reported to the county commissioners that anthracite lands in the county are worth $91,000,000. This is $67,000,000 more than the present valuation for tax purposes. The Monroe-Sekol report in 1919 set $117,000,000 as the value of coal lands for tax purposes, but this figure was set aside.

WEST VIRGINIA

Plans for the assessment of coal properties were formulated at Huntington recently at a conference for the **assessors** of the coal producing counties of southern West Virginia with officials of the state tax department at Charleston. Entering into the question are: Market value of coal acreage, stage of development, accessibility, quality and quantity of coal. It was determined that partly developed territory is worth about four-fifths as much as developed acreage, and that undeveloped territory is worth about two-fifths as much as developed areas.

Following the purchase of the bonds of the **Morgantown & Wheeling Ry.**, operating on Scott's Run in Monongalia county, by **Samuel Purseglove**, of Cleveland, identified with the Purseglove interests of that city, Mr. Purseglove has been appointed receiver of the road, succeeding **Raymond E. Kerr**, resigned, and under whose management the indebtedness of the company has been very much decreased. As of Jan. 31, 1922, the total liabilities of the company were $1,294,191.54. The Morgantown & Wheeling is soon to pass into the hands of the Monongahela Railway, that being the natural outlet for the M. & W.

Charles F. Ice, formerly with the Consolidation, but now president of the Penn Coal & Realty Co., with headquarters at Queen Shoals, was a visitor in the Fairmont regions a few days ago.

J. J. Lenhert has been appointed as sales manager of the Elk Coal & Coke Co. of Charleston. Mr. Lenhert was formerly identified with the Four States Coal Co.

The Stone Mountain Coal Co. has started work on the rebuilding of the tipple and conveyor destroyed early in 1921, by fire. This company was made the center of attack by sympathizers of the men on strike in the Mingo field and the tipple and conveyor set on fire last spring.

Further development of coal territory in the Monongalia field is presaged by the organization of the **Sutton Gas Coal Co.**, of Morgantown, which is capitalized at $75,000. Principals in this company are G. J. Cohen, Charles Neese, W. L. Barber, Arthur C. Lorant and H. G. Hartman, all of Morgantown.

The Puritan Coal Corporation will soon be in a position to begin shipping from the head of Pigeon Creek in the Williamson field. This land is owned by the Kountz interests of New York and has been leased to different concerns, the Norfolk & Western having built an extension up Pigeon Creek. The company now has its tipple well under way, with much of the equipment used in the preparation of coal also installed.

A visitor in Charleston a few days ago was **Fred Legg**, of Cincinnati, president of the Logan & Kanawha Coal Co.

W. E. Watson, president of the Fairmont & Cleveland Coal Co. has returned from a few days' business sojourn in New York and Pittsburgh.

Brooks Hutchinson, of Fairmont, an executive of the Rich Creek Coal Co. has returned to his headquarters after a business trip to New York.

J. Q. Arbogast, of Kingwood prominently identified with the Heather Run Coal Co., has returned from a business trip to Chicago.

ALBERTA

J. M. Mackie, president of the Hillcrest Collieries, operating a mine in the Crow's Nest Pass district, states that owing to the high cost of labor American coal is driving the Crow's Nest Pass product from the market. The mines in the district have been working scarcely half-time on account of the influx of coal from the American mines.

WASHINGTON, D. C.

The appropriation bill carrying funds for the Department of Commerce for next year carries the usual appropriation of $15,000 for the **Bureau of Standards** to investigate mine scales, including coal mine scales to determine their accuracy.

The Department of Commerce has decided to widen its study of coal storage to include spontaneous combustion in cargoes and bunkers. It is believed that the fire hazard in cargoes and bunkers can be reduced very materially but before making any suggestions the department will gather the best available thought on the subject. Use is being made of such data as is available of the study made by the Mercantile Marine Department of the British Board of Trade.

F. J. Katz, who has been in charge of mineral statistics for the Bureau of the Census during the time that the 1920 returns were coming in has completed that work and will resume his duties with the U. S. Geological Survey. He specializes in work on abrasives and on metallics generally.

T. W. Vaughan, who has been a member of the geologic staff of the U. S. Geological Survey for many years retired from most of his active duties on March 1. He was succeeded as chief of the coastal plains section by **L. W. Stephenson** and as chief of the West Indian geological surveys by **W. T. Woodring.**

In consideration of the Navy Department appropriation bill Secretary Denby has advised the House Appropriations Committee that further funds for the Navy in developing coal in Alaska be not provided for the Navy Department but that they be given to the Interior Department in the interest of economy. **The Alaskan Coal Commission** which has been investigating Alaskan coal under a million-dollar appropriation will probably make its report in April.

Colin H. Livingstone, vice-president of the American National Bank of the District of Columbia, who was formerly associated with the late Senator Elkins of West Virginia, before the latter's death in the development of coal lands and mining in West Virginia, was indicted for fraud against the Government as former president of the Virginia Shipbuilding Co., in connection with Charles W. Morse and others in the shipbuilding industry.

The Supreme Court directed a re-argument on April 10 of the appeal of the minority stockholders in the **Reading coal dissolution case.** The re-argument will be on the question whether the decree of the District Court of Pennsylvania is in conformity with the decision of the Supreme Court ordering dissolution of the alleged Reading coal combine.

Association Activities

Northern West Virginia Coal Operators' Association

Although desiring to relinquish the presidency of the association, A. Lisle White, of Clarksburg, was prevailed upon to accept another term and was re-elected at the annual meeting held in Fairmont during the latter part of February. Other officers were re-elected as follows: George S. Bracket, of Fairmont, secretary; John A. Clark, Jr., of Fairmont, treasurer, and E. E. McCullough, labor commissioner. Comparatively few changes were made in the board of directors, vice-presidents and members of the board for the respective districts in the association being chosen as follows:

Clarksburg District—C. J. Ryan, vice-president; J. M. Orr. Daniel Howard, A. Lisle White and J. H. Callahan.

Elkins District—Everett Drennen, vice-president; Lee J. Sandridge, A. Spates Brady and Benjamin Bissell and W. H. Greene.

Fairmont District—Brooks Fleming, Jr., vice-president; J. A. Clark, Jr., A. C. Beeson, C. H. Jenkins and G. E. Peddicord.

Grafton District—David Williamson, vice-president; F. J. Herman.

Kingwood District—T. W. Guthrie, vice-president; J. V. Gibson.

Morgantown District—S. D. Brady, vice-president; B. M. Chaplin. Directors at large: W. C. Dobbie, J. Edgar Long, C. D. Robinson, H. M. Crawford, J. W. Devison and J. P. McCune.

President White in his annual report laid special emphasis on the effort of the advisory board to secure an adjustment of wages and in the course of his report made one or two significant statements, one of which was as follows: "This policy pursued by our labor in northern West Virginia (refusal to adjust wages) has meant not only a loss of a large amount of business naturally tributary to this section, but now threatens, unless promptly remedied, almost complete loss of business to this territory for both operator and miner if contracts for the coming year cannot be made on the basis of a competitive wage scale."

Monongahela Coal Association

A meeting of the executive committee of the newly organized association was held in Morgantown in February to perfect details of the organization.

The purpose of the meeting was for a general discussion of conditions now existing in the territory covered by the members of the association, which includes all mines in the territory along and adjacent to the lines of the Monongahela Railway and its lines tributary thereto between the West Virginia-Pennsylvania state line and the southern terminus of the main railway line.

The purposes for which the association was formed are for the ascertainment and compilation of data directly or indirectly bearing on the conservation, protection, transportation and utilization of coal and its products, the promotion of the best interest of the coal industry in the territory embraced, the efficient enforcement of the State and Federal laws pertaining to mining labor and the property rights of mine operators, and encouraging all movements having in view the safety and welfare of the men employed in and about the mines.

Traffic News

The Southern Appalachian Coal Operators' Association, of Knoxville, has complained against unreasonable rates on bituminous coal from mines in eastern Tennessee and southeastern Kentucky to Louisville and adjacent points.

The Dewey Portland Cement Co., Kansas City, Mo., alleges unreasonable rates on slack coal from the Henryetta group of mines in Oklahoma and mines in the Tulsa group to Dewey, Okla.

The American Fuel Co., of Utah, alleges unreasonable rates on coal from Sego, Utah, to points in California, Nevada and Utah.

The I. C. C. has decided that the rates on mine run bituminous coal from certain mines in the Clinton and Brazil districts in Indiana to Clinton, Mt. Silica and Brazil, Ind., during Federal control were unreasonable, and awards reparation to the **Clinton Paving Brick Co.**, which complained of the rates.

In the complaint of the **Roundup Coal Mining Co.**, the commission holds that the rates on coal from Roundup and Geneva, Mont., to destinations on the Chicago & Northwestern; Chicago, St. Paul Minneapolis & Omaha and Minneapolis & St. Louis roads in the Dakotas are unreasonable. New rates of from $3.70 to $4.05 a ton are prescribed, effective May 18.

The Spring Valley Coal Co. has requested the I. C. C. to grant a re-hearing in this case in which the commission recently found that rates from the third vein Springfield and Belleville districts on coal to the Northwest were prejudicial, on the ground that the commission erred in fixing differentials between various mines and in denying jurisdiction over intrastate rates involved.

The Colorado Fuel & Iron Co., of Denver, has complained against unreasonable rates on coke breeze from El Moro Coke Ovens, Col., to Engleville, Col.

The I. C. C. has dismissed the complaint of **Theo. A. Leber**, involving rates on anthracite from St. Clair, Pa., to Port Reading, N. J., as the parties in interest have reached an agreement.

The Hazard Coal Operators' Exchange has withdrawn its complaint which alleged that the L. & N. had failed to furnish transportation for recently developed coal fields in eastern Kentucky.

The Supreme Court, in a unanimous opinion delivered by Chief Justice Taft, upholds the right of the I. C. C. to raise intra-state rates to the level of interstate rates in order to guarantee the railroads a fixed rate of return and in the general interest of an adequate transportation service. The cases decided were those of Wisconsin and New York, which contested the right of the commission to interfere with the State rates.

The Baltimore & Ohio Railroad Co. has announced a reduction of towing charges to and from the St. George and Arlington coal piers. The new charge will be 10c. per ton, minimum 200 tons, net or gross as rated, which service includes in-docking and out-docking when the towing service is performed by the St. George Towing Line.

The complaint of the **Northwestern Traffic & Service Bureau**, involving rates on soft coal from Alger, Wyo., to Grand Junction, Ia., has been dismissed, as the complainant has been satisfied.

In the complaint of the **West Kentucky Coal Bureau**, the I. C. C. on further hearing has modified its former findings in order to permit the establishment of a rate of not more than $1.985 per ton on coal from western Kentucky via Thebes, Ill., to Festus and Crystal City, Mo., provided such rate is not exceeded at intermediate points.

The Fairbanks Co., of New York, has complained to the I. C. C. against unreasonable rates on coke from Everett, Mass., to Binghamton, N. Y.

Recent Patents

Apparatus for Underground Pumping. Pierre Loubet, Paris, France, assignor to Société Hue Frères et Loubet, Paris, France, 1,401,620. Dec. 27, 1921. Filed July 20, 1920; serial No. 397,744.

Coal-Mining Skid. Thomas P. Santarelli, Coal Creek, Colo., 1,405, 337. Jan. 31, 1922. Filed Sept. 14, 1920; serial No. 410,307.

Front Head for Rock Drills. Carl P. Beaver, Lynch, Ky., assignor to Ingersoll-Rand Co., Jersey City, N. J., 1,403,284. Jan. 10, 1922. Filed July 23, 1920; serial No. 398,384.

Means for Cutting Kerfs in Mining. John M. Christine, Ford City, Pa., 1,404,835. Jan. 31, 1922. Filed Jan. 14, 1920; serial No. 351,314.

Coke-Oven Structure. Joseph Becker, Pittsburgh, Pa., assignor to The Koppers Co., Pittsburgh, Pa., 1,404,326. Jan. 24, 1922. Filed Jan. 26, 1920; serial No. 354,176.

Clamshell Bucket. Daniel Ferry, Pittsburgh, Pa., 1,404,515. Jan. 24, 1922. Filed Feb. 21, 1921; serial No. 446,668.

Mine Ventilator. Ezekiel C. Condit, Silverton, Colo., 1,404,742. Jan. 31, 1922. Filed April 4, 1921; serial No. 458,418.

Obituary

Fred Emery, 60 years old, wealthy resident of Scranton, died recently at his home. Mr. Emery was the inventor of a coal separator.

T. Percy Bryan died recently at his home in Kansas City. He was a member of the firm of Gray, Bryan & Sweeney, and was a vice-president of the National Retail Coal Merchant's Association. He was always active in retail circles in Kansas City.

Graham Wickham, vice-president of the Wickham Coal Co. of St. Louis who was well-known to the trade in Missouri, died at his home in Kinloch, Mo., near St. Louis, on Feb. 14.

Coming Meetings

New England Coal Dealers' Association will hold its annual meeting March 22 and 23 at Springfield, Mass. President, W. A. Clark, Milk St., Boston, Mass.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 18-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

Volume 21 NEW YORK, THURSDAY, MARCH 16, 1922 Number 11

The Trade Association's Future

UNDER the caption "The To-morrow of Trade Associations" the National Association of Manufacturers succinctly summarizes the situation in this field by saying: "Business looks upon associations as a luxury and supports them mainly when trade prospers. Associations have a quite different appraisal of themselves and are now striving to prove that worth to business. The war crop of associations was the largest of record—amazingly large. The weeding out process has begun. The stalwart and necessary are sharing the uncertainty and the danger of the superfluous. The associations' struggle to live matches the indifference of the business man to them when money is tight.

"Meanwhile as industry becomes more complex and as competition flourishes the business man feels a keen need to cuddle closer to his competitors for safety. The only vehicle for the necessary action appears to be the association, since more intimate forms of contact are taboo. This tendency of business to approach co-operation through the association arouses the government to discuss the trade association. The Department of Commerce, built to encourage business, wants to develop the best in the various associations. Mr. Hoover expressed it when he said that the more intense industrialization of the country resulted automatically in specialization, and specialization leads to associations of specialists. The Department of Justice cannot frown upon this movement, but must keep a watchful eye lest these centralizing movements end in restraint of trade.

"The business men, encouraged to co-operate but forbidden to combine, whirl around in a circle when asked to draw a line of association action which co-operates to the limit without combining. Because of this confusion, resulting from a disposition to lean toward associations, and from fear to take action through associations, the latter have entered a new era of uncertainty which threatens their existence. This raises the question as to what we are to do with these associations in future."

This states the case as respects the coal industry. Local trade associations and the national associations of producers, jobbers and retailers are largely a growth of the war and post-war periods. No one questioned and no one now questions their necessity and value from the early part of 1917 to the peak of 1920. But with the coming of deflation and the keen searching of the public mind into the propriety of the activities of trade groups in some lines of industry, together with the questioning of all by the Department of Justice, there has arisen in the coal industry a hesitancy barring progress and disconcerting loyal hearts.

Now is the time to take hold with a will. Give heed to the needs of the industry locally and nationally; inoculate the officers with a spirit of progress—if it doesn't "take," try someone else—and get busy on a program of developing your association to meet the problems of today, which are not the problems of yesterday.

Counteract Loose Thinking

IN SO FAR as public opinion is concerned—a matter of some importance—the bituminous coal operators are in a precarious tactical position in the present labor crisis. General unwillingness and even active opposition to the resumption of negotiations in the interstate conference on the part of the Central Competitive Field operators and the avowal of a majority of the outlying fields to settle their scales independent of whatever settlement may be reached in that historic basing district has given rise to popular feeling that the operators are opposing any wage negotiations with the union and that they are set upon its destruction. The miners' union has not been slow to seize the opportunity to strengthen its standing with the public by fostering this idea.

The direction some of this thinking is taking is indicated by an editorial in the *New York Evening Post* last week. It says in part: "If many operators really think that now is the time to smash the union, the public and the government can help disabuse them. We would welcome a vigorous direct statement from President Harding that the operators ought to go into a general interstate conference." The paper that says this is not a yellow journal. It is one of the most conservative. So far as we know, this paper has never said that the railroad executives were trying to wreck the railroad unions because they are making a drive for regional settlements with their men rather than national agreements. The case is not greatly different with coal.

It would seem to be a fair assumption that were the *Evening Post* and others as well informed with respect to the facts and arguments of the coal operators in the Central field for desiring local negotiations and settlements with their men, rather than a national contract, as they are with the circumstances governing the actions and intentions of the railroad managers, such loose opinion as that quoted above would not be found in such usually responsible quarters. It happens, however, that but one local field, Illinois, has as yet taken the pains to take the public into its confidence. In other words, we suspect that it is not so much that Pittsburgh and southern Ohio have declined to enter a Central Competitive Field meeting as the fact that they have until the last few days merely so stated and considered the mater closed that has fostered the lack of understanding of their position.

It is not that these operators have not proper motives, that they cannot maintain their position by facts, but that they have not as yet met the situation with adequate publicity. Doubtless it is this that is responsible for the concluding sentence of the *Evening Post* editorial to which we have referred, which is as follows: "The public would be equally glad to see Congress pursue Representative Newton's suggestion that it is high time we were provided with full and constant information regarding production, consumption, costs and prices in this colossally inefficient industry." Note the closing stricture. We resent it because it is unwarranted. It is, however, typical. What grieves us is the indifference of so many in the coal industry to statements such as this; refusal to recognize that if it be repeated often enough, the world will accept it as the truth and not the half truth it actually is.

Deflation the Real Issue

PLAINLY enough the real issue in the approaching crisis in the affairs of union coal-mine labor is being befogged. The real issue is whether union wage rates shall be deflated. Events of the past few weeks have been such as to make it appear that the issue is something else—namely, whether the United Mine Workers shall succeed in having a new wage contract negotiated first by a Central Competitive Field conference and subsequently by the outlying fields.

Lewis and Farrington know, as well as do the operators, that in a matter of reductions the miners' interests lie in the continuance of the basic field negotiations. The operators, determined to make a job of it and get costs down to a competitive basis approaching that in non-union fields, have adopted the opposite course; they are asking that the miners' union in each state or field meet the operators of that field, just as the anthracite miners and producers are already in conference.

It may be, as pointed out in our Washington dispatch this week, that the leaders of the union miners "know that the strike is a necessary step before the rank and file in the union develops a psychology sufficiently plastic to consider the question [of a reduction] rationally." What the Washington observers, whose opinion our Washington correspondent reflects, are overlooking is that the interstate method of negotiating is unsuitable as a vehicle for the deflation operation. Quite true it is that there must eventually be equilibrium in wages and costs between the various union fields else we have a highly unstable industry—but do not forget that now the greatest distortion is in the lack of comparability between union and non-union wage scales. To remedy that is the first step and the one we are facing now. The proper balance between union fields can and will be realized later.

To all of this abracadabra about the bituminous operators violating their solemn contract of 1920 to resume prior to April 1, 1922, Central field negotiations we can but reiterate that it is a technicality, for the miners tore the contract up within five months of its signing and themselves reverted to state settlements in August, 1920, to gain a larger advance in day wages than awarded them by the President's commission.

As Secretary of the Department of Labor, Mr. Davis is doing the customary thing when he calls on the operators to meet the miners—in the way the miners want to meet. Something more definite must be forthcoming before we will be convinced that the activities of Secretary Davis so far represent the attitude of the administration.

Improved Practices in 1922

LABOR IS conservative. Every man wants to be more than sure of his full wage and is opposed to any change in methods of operation unless he is convinced that it will greatly benefit him. Labor also is apt to be greedy. The miner would have the operator put in expensive machinery, experiment with it, furnish power for it, maintain it, repair it, yet give the workman all the benefit accruing from its use.

When the laborer is in the ascendant he opposes change. Now that all conditions are propitious it would be extremely foolish not to make a supreme effort to introduce at a somewhat reduced scale per ton machinery that will lighten labor and increase output. The arc-wall machine is a case in point. An arc-wall price should be established. The labor and the time of prying a machine into place is saved by using this form of coal cutter. When it is installed the cutter and scraper are greatly benefited, and they should be willing to make its entry into the field profitable to the operator as well as to themselves.

Where jackhammers and other air drills are supplied free and even where only the power and piping for their operation are furnished, consideration for these items should be made in the tonnage scale. One of the most gruelling parts of mining is the drilling of roof, floor or coal. The operator who supplies the wherewithal to make the drilling easy should share with the miner the profit that such machinery makes possible.

Labor will give no service to capital without reward. Why then should the capitalist expend money to help labor without appropriate return? What is true of the jackhammer also is true of the electric drill and of the electric current and wiring that are provided for the driving of such machinery.

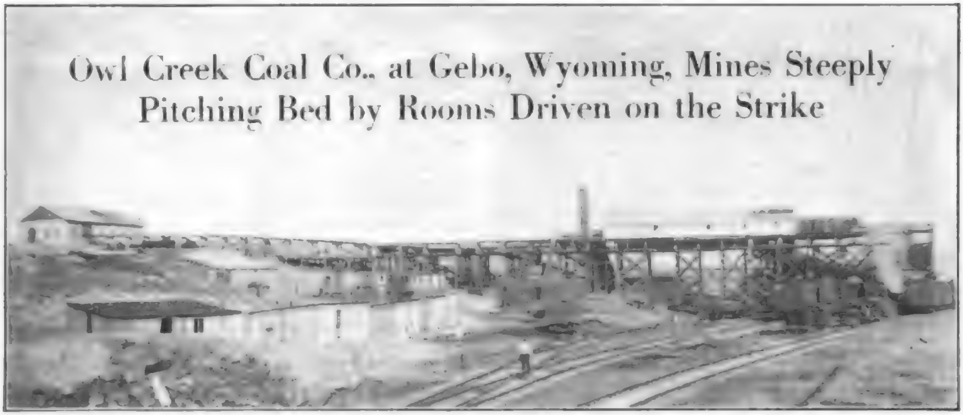
A differential should be given also for longwall cutting. No one should be deprived of a reward for enterprise or effort. To deny such a reward is no more nor less than Bolshevism. We have seen how deprivation of all returns to outlays of capital and expenditures of labor has strangled Russia.

Either the equal turn must be abolished altogether or an increased turn must be given to those who, by using electric drills, jackhammers or working by longwall methods, have their ability to produce increased and their rate of compensation per unit of production decreased.

The introduction of improved machinery should be accompanied by improved supervision of men, machines and power supply. To buy machinery and leave it to its own devices is an ill-advised expenditure. Labor is none too friendly to new equipment, and the power available is none too adequate for increased demand. In consequence when a new machine is introduced someone should be employed to make its operation successful and to see that its ability to produce is not limited by a shortage of power, cars, wiring or repairs.

Only the other day a manufacturer went to a mine to see why his machine was not being used. He induced the management to have it operated under his supervision. He found the man who was to run it had no wrench and as he needed one he sent him out to get it. After an hour the man returned. He had the wrench. The bolt was turned and the man left. The wrench was only borrowed. He must return it, and another hour was lost. No wonder the machine was not proving a profitable acquisition.

Owl Creek Coal Co., at Gebo, Wyoming, Mines Steeply Pitching Bed by Rooms Driven on the Strike



A Pitch Too Flat to Permit Sliding Yet Too Steep for Easy Car Movement and Coal That Ignites Readily by Spontaneous Combustion Are Among Obstacles Overcome at This Operation

By C. M. Schloss
Denver, Colo.

THE Gebo mine of the Owl Creek Coal Co., in the valley of the Big Horn River in that part of its course in which it travels through the State of Wyoming, is located on a north and south branch of the Chicago, Burlington & Quincy R.R. about 500 miles north of Denver and 200 miles south of Billings, Mont. Though of moderate size in comparison with some of the collieries in the Eastern coal fields of the United States, the plant is of interest because of the means employed in mining the seam, which lies on a heavy grade. Another detail of unusual interest is the provision made for loading box cars at the tipple.

Wyoming has a large area and a sparse population. No factories or other industrial plants of any appreciable size have been established within its boundaries other than a few oil refineries and beet-root sugar mills. The former burn natural gas as fuel, and the latter operate only from September to January. Thus the local demand for fuel is small, and the coal mined at Gebo has to be shipped long distances. In order to prevent the coal from deteriorating from exposure to the weather, as well as to avoid certain other losses incident to long railroad hauls, most of the lump and nut coal is shipped in box cars.

Shoveling coal from the side door of a box car to the end by hand would be so expensive as to be prohibitive. Four men would be needed to each car. Accordingly four Manierre box-car loaders have been installed. Two of these are of the steel-apron type and are used for handling lump coal. The other two are of similar construction but employ endless rubber belts and are used for handling nut coal.

The shaking screen installed in the tipple is provided with several gates, making it possible to load slack on track 1 either in open or in box cars; pea or nut in open cars on track 2; nut or lump in open cars or lump in box cars on track 3, and lump in open or box cars on track 4. The flexibility of operation thus obtained obviates the necessity of stopping the screen when shifting cars.

Slack is loaded into box cars on track 1 or pea into similar cars on track 2 through flexible spouts. Box-car loaders are not provided for these sizes. When it is necessary, pea can be loaded by means of box-car loaders with the aid of the pea conveyor. Nut can be loaded in box cars on track 2 or 3. A gate in the screen discharges this size onto a steel apron conveyor 30 in. wide extending between these two tracks. Pickers are stationed upon either side of this apron, which carries the nut to the two-way chute as shown in Fig. 2. This delivers the material to either track, as required.

Extra long arms are provided for one of the nut and one of the lump loaders. This provision, which is

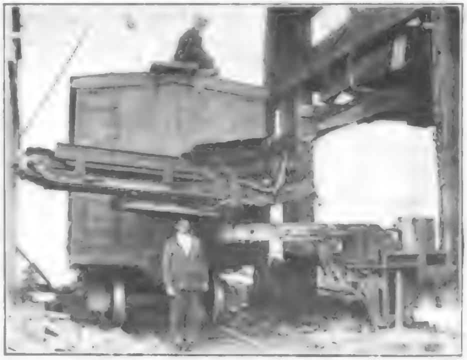


FIG. 1. FOUR BOX-CAR LOADERS USED AT TIPPLE

This is one of the two loaders of the steel-apron type which are used for loading lump coal. For nut coal endless rubber belts are used and when the belts wear they are "shingled" with short pieces of belt by the aid of flat-headed elevator bolts.

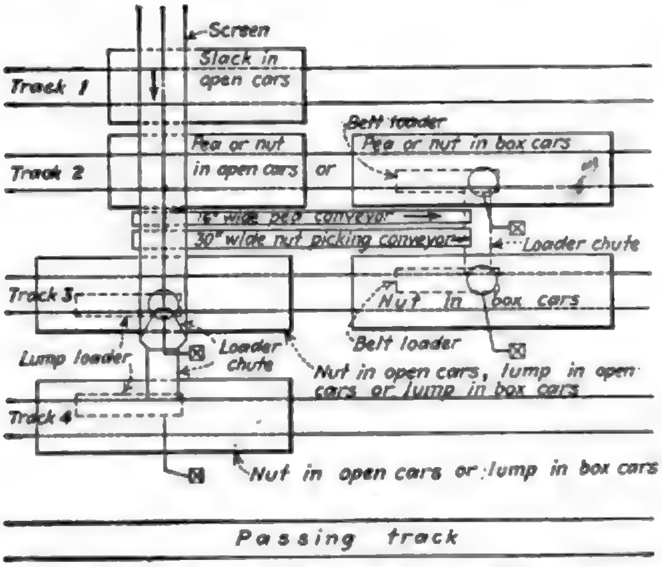

Screen
Slack in open cars
Track 1
Belt loader
Pea or nut in open cars
or
Pea or nut in box cars
Track 2
16" wide pea conveyor
30" wide nut picking conveyor
Loader chute
Track 3
Nut in box cars
Belt loader
Lump loader
Loader chute
Nut in open cars, lump in open cars or lump in box cars
Track 4
Nut in open cars or lump in box cars
Passing track

FIG. 2. SCHEMATIC PLAN OF TIPPLE PLANT

The product of the mine enters the tipple on the left, following the direction of the arrow. It then is screened and the smaller sizes loaded into open cars. If desired, however, pea and nut are taken to box car loaders by a conveyor and loader chute and placed in box cars, the nut being picked on the way. The lump continues on to a point over tracks 3 and 4, where it is separated and run to box-car loaders. Into open cars on these two tracks nut coal can be loaded if desired.

not unusual, is made necessary by the insufficiency of room between the tracks to accommodate two loaders which, if installed, would be placed opposite the chute and across the tracks.

The officials of the coal company have devised an interesting method whereby the life of the rubber belts used on the box-car loaders may be lengthened. When these belts begin to show wear they are "shingled" with short pieces of old belt. Each shingle is held by four flat-headed elevator bolts. These bolts are equally spaced across the width of the belt and set 1 in. from the edge of the shingle. The shingles, of course, overlap yet are separate and can be replaced easily. They relieve the belt of much of the wear and of practically all of the abrasion resulting from handling the coal.

The bed worked at Gebo pitches at an angle of 20 to 21 deg. Fig. 7 is an illustration made from a photograph taken in one of the rooms just after shots had been fired. It gives an excellent idea of the way in which the coal comes down. In the deepest part of the mine the overburden is 800 ft. thick. The cleavage planes of the coal extend at an angle of 45 deg. to the pitch, and the bed varies in thickness from 5 or 6 ft. at the outcrop to 10 ft. in the lowest level. The coal itself is clean and not difficult to cut. It ignites readily from spontaneous combustion, however, which circumstance makes an ever-present fire hazard which must be carefully watched and guarded against.

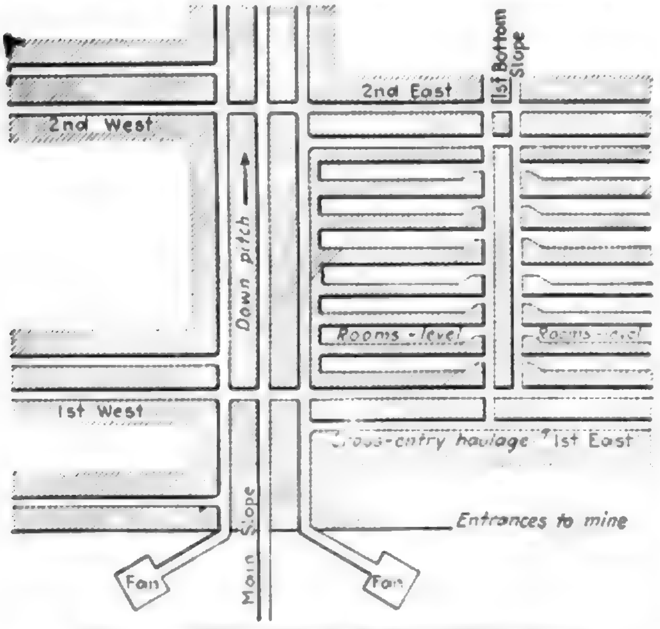

2nd East
1st Bottom Slope
2nd West
Down pitch
Rooms - level
Rooms - level
1st West
Cross-entry haulage
1st East
Entrances to mine
Main Slope
Fan
Fan

FIG. 3. METHOD OF MINING ON THE STRIKE

This has replaced the old method in which the rooms went up the pitch, which was heavy enough to occasion much trouble but not sufficiently steep so that coal would run in steel-plate chutes.

Fig. 3 is a partial projection of the workings. The mine was developed by driving three openings straight down the pitch. Some distance downward a pair of level entries were turned right and left, known as the First East and First West. From these rooms were driven up the pitch and chute mining attempted, with only indifferent success. The grade is not steep enough to permit the coal to slide freely, even when the chutes are lined with sheet iron.

When the present mine foreman entered the employ of this company, he had much difficulty in persuading the management to experiment with what has developed into the system of mining now followed. This method of operation proved a success from the start and has been extended throughout the entire operation.

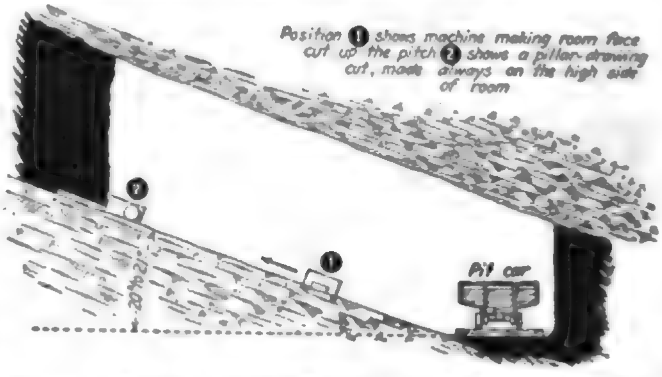

Position ① shows machine making room face cut up the pitch ② shows a pillar-drawing cut, made always on the high side of room
②
①
Pit car
20 to 21 deg.

FIG. 4. POSITION OF MACHINE MAKING FACE CUT AND PILLAR CUT

Despite the grade of 20 to 21 deg., or 36 to 38 per cent, the machines are without difficulty kept in place, especially when the bits are allowed to become a trifle dull.

Six pairs of cross entries have been turned to the right and left off the main slope. The distance between pairs varies from 225 ft. near the surface to 800 ft. in the deepest portion of the operation. Instead of turning chute rooms from these entries, as was formerly attempted, butt slopes are driven down the pitch at intervals of 650 ft., connecting the various levels.

Rooms 22 ft. wide and 300 ft. long are turned off the butt slopes on both sides. These rooms are driven practically level. Thus the rooms from adjacent butt slopes would eventually meet, but they are stopped before this occurs and a pillar 50 ft. thick is left between the faces of the two ranges of rooms. This will prevent the air from circulating from one range of rooms to another should a fire start. The coal in these pillars is left permanently and is, of course, lost when the section is finally sealed off. The upper panels contain seven to eight rooms, and the lower ones eight to eleven.

The coal is undercut to a depth of 6 ft. by standard Goodman shortwall machines, both alternating- and direct-current types being used. In advancing the room faces, cutting may be done either up or down the pitch.

Fig. 6 illustrates the machine being maneuvered into position to make its sumping cut on the high side of the room. Fig. 4 shows the position of the machine when slabbing pillars, cutting breakthroughs and when moving across the face up the pitch. The first two of these operations are made on the high sides of the rooms but the machines can perform any of the three without difficulty. In fact it is remarkable to see how easily they can be handled under conditions so trying.

In order to keep the cutter bars completely under the coal when working up the pitch it has been found necessary to place jack pipes close to the machine and to use dull cutter bits. The friction of the dull bits naturally exerts a reaction upon the machine. On the butt entries the machines are raised or lowered by means of hoists, the pitch being so steep that they cannot ascend or descend under their own power. For driving slopes a breast machine has been mounted on a mine truck about 18 in. above the rails. This device was made necessary by reason of the accumulation of water in the low places.

A 2,000-hp. cylindrical-drum steam hoist, equipped with a 1⅜-in. steel cable, hauls the cars on the slope. These cars weigh 2,500 lb. empty and 7,500 lb. loaded. Ten of them constitute a trip, and 80 to 90 trips are made per 8-hour day. The rope speed is quite fast, averaging about 2,000 ft. per minute.

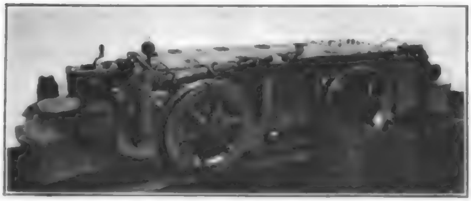


FIG. 5. INSIDE-FRAME TWO-MOTOR TROLLEY LOCOMOTIVE

This is used for haulage on the cross entries. It is a 6-ton machine, hauling to the main slopes 45 to 50 cars.

Four 6-ton Goodman two-motor inside-frame locomotives are used for haulage on the cross entries. One of these is shown in Fig. 5. They haul to the main slope trips of from 45 to 50 cars, taking them from the various partings on the cross entries, which in places are as much as 3,000 ft. in length. The inside-frame type was preferred because the brakes are easy of access and the machines can readily be replaced when they leave the track. As may be seen in Fig. 5, they are equipped with spring bumpers and draft gear. This provision saves the cars from much violence, reduces the spillage of coal, decreases crystallization in the car hitchings and spares the motorman from many shocks and jars.

FIG. 7. FACE OF A ROOM DRIVEN ALONG THE STRIKE

A shot has just been fired and has not been cleaned up. The coal has a dip of from 20 to 21 deg. and measures from 5 to 10 ft. It is a sub-bituminous coal.

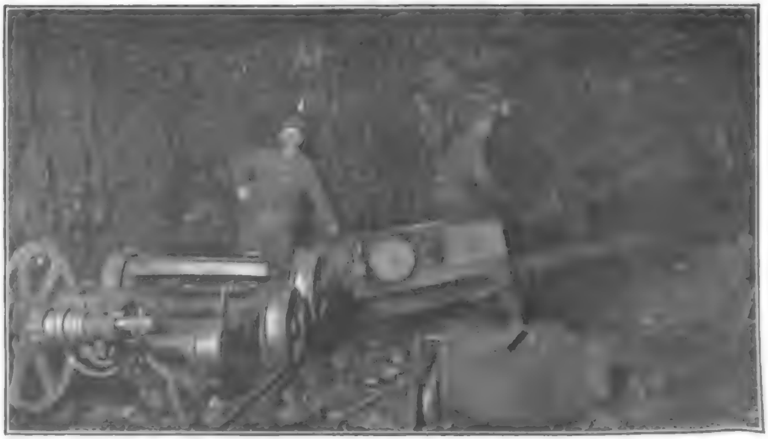
Direct current for operation of the locomotives and mining machines is supplied by one Ridgway synchronous and one General Electric induction motor-generator set. The former is of 200-kw. and the latter of 100-kw. capacity. These machines are located at different points underground. At the heads of the stub slopes 50-hp. hoists are placed. These gather the loads from the room necks, replacing them later by empties. The miners move the cars by hand from the necks to the room faces and when they are loaded push them back to the slope.

The slack which collects on the tipple and the refuse from the picking table are disposed of in an unusual manner. The tipple stands immediately over the main slope and to the latter two round holes have been sunk.

FIG. 6

Preparing to Sump

Rooms are 22 ft. wide as a rule and the track is on the low side of the room. This, however, does not prevent "sumping in," especially with the device of using blunt bits for cutting.



These have been lined with concrete and supplied with gates on the bottom and hoppers at the top. The slack is swept into one opening, and the refuse is thrown into the other. After working hours, if the holes have filled up, cars are lowered underneath them, the gates opened and the holes emptied. The refuse is hauled to the surface to be disposed of by the usual means, and the slack is sent through the tipple, as is other coal from the mine.

"Owl Creek" is a high grade of sub-bituminous coal believed to be the equal of any similar fuel produced in the West. The Gebo mine as a rule works steadily throughout both winter and summer. This is an unusual condition, as many properties in this region are winter producers only. These are sometimes sarcastically referred to as "snow birds."

Conference on Mine Cables Would Condition Permissibility on Frequent Inspection

TRAILING electrical cables for use on mining machines formed the basis of a conference recently held at the Pittsburgh Experiment Station of the U. S. Bureau of Mines. Cable and mining-machine manufacturers, coal operators and Bureau of Mines engineers were in attendance. Some of the salient features of the proceedings were as follows:

Cables as at present constructed were deemed adequate in capacity by machine manufacturers while the cable manufacturers seemed to think that their size should be increased. Operators experience little trouble on 500-volt circuits where the cables are protected by fuses. Conductors of small diameter are necessary in order that they may be handled easily and reeled properly. Furthermore small conductors may be safeguarded by a requirement that the voltage of machine circuits shall not fall below predetermined values.

Cable manufacturers stated that cables up to No. 4 size are now made with 49 and larger sizes with 133 wires. Machine builders do not get out specifications for cables but merely ask makers of such equipment for a suitable flexible cable of a certain capacity.

For mine service a better grade of insulation than that specified by code requirements was believed necessary by the cable manufacturers, who are now working on a set of standards. In the past competition has been keen and in many instances insulation of an inferior quality has been furnished. Conductors having an outer covering of rubber of a quality similar to that used in the treads of automobile tires have been tested by the Jeffrey Co., and are strongly advocated by this firm. It is believed that this construction greatly adds to the safety of machine operation, as such cables are more likely to withstand being run over by a locomotive without severance, which would cause arcing. All cable manufacturers can make this type of cable if trade conditions warrant such a procedure.

If possible, mining machine cables should be "non-kinkable." The old type of twin cables kinks badly. Concentric cables give little trouble from this cause. It is possible to use a twin cable, employing rubber insulation that is said to be non-kinking. Twisted duplex cables, while enjoying immunity from kinking, generally are large and unwieldy for machine service.

It was the consensus of opinion that the Bureau of Mines should continue to require the use of satisfactorily insulated handles or some other means of connecting machine cables to the source of power supply not involving a personal hazard to the one making the connection. At all points where gas is likely to be encountered, interlocking switches should be used. At present no suitable switches of this type are on the market. The operator is ready to purchase them and the state mining departments probably would enforce their use were they available. Both fusible and non-fusible switches should be developed. The Bureau of Mines will continue to require proper protection of the machine end of all cables, as prescribed in Schedule 2-B.

One operator now protects nearly all his machines from short-circuits by means of a fuse at the end of the trailing cable where it connects with the power circuit. These fuses are placed in the handles attached to the outer end of the trailing cable and are made explosion proof. They are said to be used only on intake air. The opinion prevailed at the conference that all trailing cables should be fuse protected either where the cable joins the power circuit or at some point within that circuit that would afford adequate protection. The opinion also prevailed that the Bureau of Mines should require protection of the trailing cable by means of proper fusing of the machine circuit as one of the conditions of permissibility. If such fuses are installed in gaseous places they should be housed in explosion-proof compartments.

It was the sense of the conference that permissibility should be made conditional upon frequent inspection. Renewals should be made with the same quality of cable as was originally approved. A list of cables approved for new installations or for renewals doubtless will be worked out later.

All manufacturers of approved equipment agreed to furnish the Bureau of Mines on request with a list of the companies purchasing approved machines of their manufacture. The bureau will then be in a position to advise these machine owners from time to time of any steps that may be taken to increase their safety.

Big Outputs! Has Any Shaft Done Better?

OUR recent inquiry about production records has received an apparently satisfactory answer from Frank J. Smith, of the Chicago, Wilmington & Franklin Coal Co., of Chicago. Mr. Smith sends us a circular of the company telling of three production records made by its Orient mine in Franklin County, Illinois. These are as follows: Record for one day, 6,777 tons, made on March 6, 1919; for one week, 34,792 tons, made during the week of Oct. 24 to 29, 1921; record for one month, 144,576 tons, made in the 26 working days of October, 1921.

These are given in each instance as the world's record for any single mine up to the date given. That they are not unbeatable is admitted by Mr. Smith, for he states that the weekly record of 34,792 tons given above has already been bettered by Orient with 36,185 tons produced in the week of Jan. 24 to 30, 1922, inclusive. Can any one else do better?

[The daily record here set forth represents the total extraction of over ¾ acre of a 5-ft. bed of coal. It is recorded that the bed at Orient ranges from 8 to 10½ ft. in thickness.—EDITOR.]

THE BUREAU OF CONCILIATION of the Department of Labor has practically completed its compilation of information concerning coal wages and conditions in the coal fields which has been conducted since the first of the year under Hywel Davis, one of the conciliators.

Selection of Most Suitable Coal for a Given Plant Is Engineering Problem Involving Diverse Factors*

Fuels Available, Equipment, Character of Load and Service, Labor, Available Space and Real Estate Values Must Be Considered—Uniformity Chief Quality to Be Sought—Equipment Should Be Adapted to Coal Used

By O. P. Hood†

Exclusive to Coal Age

THE art of buying presupposes a need to be filled. The need must be as clearly defined as may be in order that one may know whether the purchase is really satisfactory. A certain kind of satisfaction can be obtained if one is comfortably ignorant of just what is wanted. Another kind of satisfaction also may be had from the knowledge that we are following conventional lines and doing what everybody else does, which must, therefore, be the proper thing. However, when a body of men make a business of purchasing, it is to be expected that their art has been carried far beyond these elementary stages, and that whether the article to be purchased be pins, pickles or periscopes, a careful investigation will be made of the need to be filled and the fitness of the offered article to fill that need.

Coal usually is purchased to produce heat by means of the addition of human labor requiring wages, and the aid of certain devices involving fixed capital and maintenance. The desire usually is to produce a unit of output for the least over-all expense. The problem thus stated immediately presents itself as a complicated one, involving human factors and a phase of engineering construction and practice.

How Some Purchasing Agents Buy Coal

If the purchasing officer knows it all he probably will proceed to buy just coal, satisfied with certain concessions in price obtained in a contest of wits with a keen selling agent who knows his every failing. If the purchasing agent's long suit is heavy hardware and machinery, and he will admit that he knows very little about coal, he probably will lean heavily for advice either on the coal salesman or the man in the boiler room firing the coal. If he gets hold of the best of the coal men, it is probable that he will receive as good service in normal times as he can expect to get in this world of imperfection. But let me hasten to add that there are a great many coal salesmen that do not belong to this select and restricted class. If our purchaser depends upon word from the boiler room he is apt to get excellent advice from the standpoint of reducing the human labor factor to a comfortable minimum, but usually the other factors of unit-output cost are not available to the adviser. Between the average coal man and the average boiler room it probably is safest to follow the boiler room, but neither course will satisfy a real purchasing agent intent on rational purchase methods.

It is no wonder that the problem of coal purchase is a troublesome one. Coal occupies an extended portion of a series of things that begin on the one hand with gas and oils and end on the other with diamonds. The difference between successive products in the series may be small but complex. If you live in North Dakota you mine a coal that is dry in appearance but is composed of one-third water. If you mine in Rhode Island you get a fuel and a furnace refractory in the same seam, and they look much alike. If you buy when competition is keen and labor relations are good, you get 6 per cent of ash, and when the whole machine is in reverse you get 16 per cent or go without. With these wide variables to contend with it is no wonder that complacency in buying coal goes only with a comfortable amount of ignorance.

The proper selection of the type of coal for a given plant really is an engineering problem, involving available fuels, equipment, character of load and service, labor, available space, real estate values and a multitude of factors which no purchasing agent should attempt to decide unaided. There should be advice from some source that has included all of these factors in a careful analytical study that ends in a statement of over-all costs. It is surprising how little of this is done. In the great industries such as electric utilities, where 60 or 70 per cent of the total costs of output are for coal, there is a lively appreciation of the problem, but in the general manufacturing business there is much room for improvement in coal choosing practice. Whatever the method of arriving at the type of coal to be used, whether anthracite or bituminous, high or low volatile, run-of-mine or screened, the most important quality to be sought for the sake of efficient use is that of uniformity. From an engineering standpoint good results can be obtained, whatever the fuel, by careful adaptation of equipment and practice in each case. If it is necessary or desirable to use coal with 20 per cent ash, of a clinkering quality, equipment can be provided to use it, but it is disastrous to economy to expect to use such coal in equipment planned for rapid burning of low-ash coal.

Equipment Must Be Adapted to Fuel Chosen

The State of Brazil, S. A., unfortunately has only high-ash coal. Suitable arrangements are made there for its use, but when high-ash coal was supplied to our industries during the war, the wheels of production were dangerously clogged. Equipment was not adapted to it. It requires combustion space in the ratio of 3.2 for low-volatile Eastern coal, 3.9 for Pittsburgh coal, and 5.8 for Illinois coal. The fixed carbon of any coal is burned on the grate, while the volatile matter is burned in the space above the grate. Evidently, a plant adapted to one fuel may be ill adapted to another.

The human factor also balks at change and becomes less efficient, requiring careful handling and direction to become adapted to something different. During the war a cargo of pool 1 coal from Lamberts Point was sent to Finland. It was good coal, but characteristically friable, and our Finnish friends insisted that it was dirt, although admitting that the heating value was in the coal. They were used to a blocky coal of poorer intrinsic value, and failed at first to get good results from a better coal of unfamiliar characteristics.

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*Based on an address to the New York chapter, National Association of Purchasing Agents, Feb. 21.

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For efficient operation, therefore, uniformity of quality is quite as important as absolute quality. In a well-equipped station capable of running at high rates of combustion and depended upon to meet peak loads, a few cars of different coal having a lower ash-fusing temperature may put the plant out of business at a critical moment, whereas had that quality been constantly in use, rates of combustion would have been kept lower and the peaks met with added boiler capacity.

This question of uniformity of quality, be it good or bad, is of far more importance for economy than usually is recognized. Our coal selling and distributing mechanism is not well adapted to insure uniformity of quality. Coal dealers handling the coal, perhaps, from many mines, and never handling anything but good coal, of course, see no harm in borrowing and lending coal among themselves or shipping according to convenience from any one of a number of mines. In fact, the complexity of modern coal distribution almost demands such practice in times of large demand, as was illustrated by the pooling system.

Importance of Uniformity in Pooling Coal

Of late the question of uniformity has taken an interesting turn. When we began to export considerable coal a serious difficulty in transportation arose from the necessary delay of cars and clogging of terminals while sufficient coal could be accumulated from the mines of any one dealer to fill a ship. During this accumulation, coal of similar, or it might be identical, nature was being accumulated by some other dealer at the same pier. What more natural than to borrow and lend this coal, to the mutual advantage of both dealers, and thus expedite both rail and vessel shipment? The orderly conduct of this borrowing and lending produced the pooling system and the coal exchanges. If the coal thus borrowed and lent was of closely similar quality the customer also reaped an advantage in the matter, because of the expedited service. There were, however, practically no standards that would automatically determine which coals might, with reasonable justice to the consumer, be thus exchanged. The nearest approach to a standard is what is known as navy coal, but navy coal is only supposed to be the best coal to be had from a given district and from mines meeting certain requirements. It cannot be said to have analytical limits. Navy coal from one district is different from navy coal from another district.

Coal classification, therefore, was largely a matter of opinion of coal dealers, and the users had practically nothing to say in the matter. As a war measure it worked. With a restricted market the plan went to pieces, one potent factor being a lack of reasonable uniformity of quality in any one pool. The underlying idea, however, is right, and with proper classification would be a real help to all purchasers. When one exchange resolved to base its classification on analysis, publish the analytical limits of each class or pool, and provide effective mechanism to discover the facts and keep the pools clean within the specified limits, the Bureau of Mines was glad to lend its aid and support as being a step in advance and of national importance. Beginning last April, the Sewalls Point Coal Exchange operated under this plan, sending some of its coal to New England.

And now the psychology of the purchasing agent appears. The coal salesman was no longer able to claim that his coal was better than the other fellow's, and back it up with the usual arguments that had been potent in the past. His special selling ability was reduced to that of selling Fords or other standardized products. He made representations to the effect that if the curse of a standard analytical limit could be removed he could get 10c. a ton more for the same coal. And I am inclined to think that he could. Such is the state of the coal business.

I am told that being freed from the pool system, the seller represented that his cargo of coal was from one mine, and that the best in the pool, and that therefore greater uniformity of product would be assured. The cargo was followed through and found to be made up of coal from several mines, as before, but there was no check on the mines delivering, as there had been under the pool. Here is a case where the value of uniformity is recognized by promising to replace sufficient uniformity with super-uniformity, but with a result of less uniformity at an advance in price.

What is there that a purchaser can tie to in troubled waters of this sort? The essence of a good business bargain is an exchange where both parties profit and are satisfied. Satisfaction comes from receiving what you expect to get. Dissatisfaction comes from receiving something less than you had a right to expect. When you have found a type of coal supposed to be suitable for your needs and adapted to your equipment, the problem becomes one of so defining the coal that it can be specified, and of determining the range of variation allowable in order that reasonable competition and assurance of supply may be had.

Check Up Quality Promises by Analysis

It is here that analysis plays a major but by no means the sole part. Analysis is a potent aid in defining what you want and expect to get, and acts as a basis for determining whether you actually get what is promised. Briefly, it means a partial definition of the coal by figures representing some of its constituents. Instead of a more or less descriptive trade name it substitutes numerical quantities which have something to do with its supposed value. As a movement well under way fifteen years ago, it had a steady growth in favor up to the time of the war. Its overenthusiastic friends were, as usual, its greatest enemies. Its shortcomings as a sole reliance for coal quality soon became apparent. As in most new things, the early tendency was to complexity, and specifications involving analysis became cumbersome and more or less a form. It soon became apparent that the method could be sadly abused to the detriment of either or both parties. The present tendency is to simplification and a shorter contract, and a better understanding of the part analysis may play in the purchase of coal.

At The Southern Experiment Station of the U. S. Bureau of Mines, Birmingham-Tuscaloosa, Ala., determinations have been made as to the relative combustibility of different cokes in a brick combustibility furnace. Further work was done with the shatter and friability tests, and the true and apparent gravity determinations are practically complete. Float and sink tests have been made on a sample of coke breeze submitted by the Sloss Sheffield Company to determine if sufficient ash elimination could be obtained to make feasible the mixing of cleaned coal with raw coal before carbonization.

Better Ventilation as an Aid to Mining Efficiency

New Determinations of Coefficient of Friction—How Air Capacity of Mine Was Doubled and Water Gage Lowered—Equipment for Canvas-Pipe Ventilation—Good Air Stimulates Workers—Boosters That Fail to Boost

ABOUT $4,000,000 has been expended in the better ventilating of the Butte mines so as to bring the air in them almost up to coal-mine standards. A paper by A. S. Richardson, ventilation engineer—note the title; they have experts in every department—of the Anaconda Copper Mining Co., was presented by W. P. Daly, the mining superintendent of that company, at a joint session of the American Institute of Mining and Metallurgical Engineers and the National Safety Council in the morning of Feb. 21. It is necessary here to pass over many interesting details related by Mr. Richardson in his paper regarding the difficulties of working in mines 3,200 ft. and even 3,400 ft. deep with temperatures reaching 104 deg. F. and with inflows of water at 113 deg. F., but a careful analysis of the causes of the high atmospheric temperatures are given—decay of mine timber, heat of mine water and rock, oxidation of sulphides, electrical current and mine fires. The author regards the decay of timber as being a more important source of heat than any other single cause, which is an interesting conclusion for coal men.

But though the paper contained much that has particular reference to deep and abnormally warm mines it is important to note that most careful measurements were made of the coefficient of friction, which expresses in pounds per square foot the pressures necessary to overcome the resistance offered by one square foot of rubbing surface at an air velocity of one foot per minute. In all cases the area used in making the calculations was the clear area of the air course inside the main timber, and the rubbing surface was assumed to be that which enclosed the clear area.

COEFFICIENTS OF FRICTION NEWLY ASCERTAINED

For rectangular shafts of two or more compartments with open timber framing the coefficient lies between 0.0000000072 and 0.0000000096, the variations being dependent mainly on the condition of the timber, such as lagging. For rectangular shafts in which each compartment is a separate smooth-faced duct, the coefficient runs from 0.0000000014 up to 0.0000000023. For timbered drifts and "crosscuts" (roadways across the vein) about 5 x 7 ft. in the clear the coefficient ranges from 0.0000000077 up to 0.0000000109, the variations depending on whether the air course is straight or crooked. For untimbered crosscuts the coefficient lies between 0.0000000031 and 0.0000000044; the variations in this case are also dependent on whether the crosscut is straight or crooked. For the manway compartment of raises almost any figure from 0.0000000125 upward may be obtained, dependent on the condition of the raise—that is, the roughness of its interior surfaces.

These figures are based on gage readings that ranged from 3 in. to 15 in. and are believed to be fairly accurate considering the limitations of the instruments used and the character of the problem. It was possible to note the variations in resistance caused by the passage of a cage through the section of the shaft upon which the determinations were made, also by a man standing and walking in opposite directions in a drift and by a mine car standing in a crosscut, the last being equal to about 40 ft. of the crosscut.

Nevertheless, as all determinations made with either pitot tube or anemometer depend for their accuracy on the assumption that the flow of air takes place in straight lines normal to the plane in which the instrument is held, serious inaccuracies must occur because this assumption is unwarranted by fact. Obstructions such as mine timber, changes of direction of air courses and similar influences produce a swirling, or eddying, motion of the air which varies both in direction and velocity at all points across a given plane. Nothing beyond an approximation in measurements is, therefore, possible, and accuracy is in the greatest degree dependent on the care used in making it.

DOWN-AND-UP TRAVEL EXCEEDS CROSS TRAVEL

The coefficients that have been given are, therefore, nothing more than approximations, and must be so considered. Further, other conditions, such as local restrictions of clear area of workings and abrupt turns in main air courses, may have such a bearing on mine resistance that the use of calculations based on friction coefficients must be governed by careful judgment.

In his paper the author goes on to say that the speed of the air in the shaft is the important item and points out that in the Butte mines the air has to pass about 5,000 ft. down the shaft and up again, whereas it travels horizontally an average of little more than 1,000 ft. and is so split into slower moving currents in the under-

CONCRETE SHAFT-LINING SLABS AND ANGLE PIECES

These are pointed later with mortar, thus making the shaft fireproof. The illustration is taken from a photograph made before pointing the joints. Angle pieces are necessary to support the slabs as tops of wall and end plates are cut away by the falling rock.

ground workings that the friction is not great even when these airways are rough.

If it may be permissible to interject comment into this recital of the author's remarks it might be said that in coal mines the depth usually is far less rather than greater than the horizontal distance traversed by the air. In fact the ratio may be 200 to 1 in the coal mine as against 1 to 5 in these metal mines.

Perhaps this explains why at the Parnell shaft such wonderful results were obtained by smooth surfacing, though this shaft is not 5,000 ft. deep but only 2,800. Before the surfacing of the walls the fan at this shaft carried 135,000 cu.ft. per minute and after the walls were smoothed 260,000 cu.ft., the fan suction in inches of water gage being 3.6 in. in the first instance and only 3.4 in. in the other. This shaft draws air from two separate mines, so that the downcast speed is not nearly so great as that of the upcast. The Parnell shaft had one compartment 7 x 5 ft. and two others 5 x 5, so its clearance is 85 sq.ft. It will be noted from this that the speed of the air in the Parnell shaft is now 3,060 ft. per minute, which most coal-mining men would think excessive.

To return to Mr. Richardson: At first it was proposed to give the shaft a smooth surface by the use of 1-in. sheeting, surfaced on one side, but later, in accordance with the general fireproofing plans, the management decided to use concrete flat slabs and angular pieces, precast at the surface and held in position on the shaft timbers by wedges and cement mortar. The wooden wedges serve mainly to hold the slabs in position until the mortar has set. In shafts surfaced with sheeting nailed to the face of the shaft timbers, the nails are destroyed by copper water, so that the sheeting often falls across the shaft and obstructs the flow of air. As no metal is used in fastening the concrete slabs in position, this damage has been eliminated. In several shafts not only are concrete slabs used but concrete water boxes. These are set in the corners of the shafts.

Flexible Pipe Used in Dead-End Places

In confined places such as the dead ends of crosscuts, drifts and raises, small blowers are used to force fresh air from the nearest source of supply through canvas pipes to the working face. To standardize equipment the pipe sizes in Table I have been adopted.

TABLE I. SIZE OF VENTILATING PIPE.

Where Used	Length of Pipe	Size of Pipe	Size of Fan	Blade Size	Direct-Connected Motor
Raises where space available is small..	Under 250 ft	8 in.	No. 2½ Sirocco	½ width, standard wheel	3 hp. a.c.
Crosscuts and drifts......	Under 250 ft.	12 in.	No. 2½ Sirocco	½ width, standard wheel	5 hp. a.c.
Other places, including stopes	Over 500 ft.	16 in.	No. 4 Sirocco	½ width, standard wheel	10 hp. a.c.

Selection of blowers was governed by the fact that within certain limits the pressure exerted by a blower to force air through the pipe is a function of the rim speed of the wheel, while the volume of air delivered against a given pressure is dependent on the width of the wheel. Under a given pressure, a canvas pipe will carry only a limited quantity of air. The problem then is to proportion the width of blower wheel so as to obtain maximum efficiency, considering the volume of air that the pipe will carry at the pressure developed by the blower when running at constant motor speed.

The power required to drive the blower, running at constant speed, decreases with each additional length of pipe added or with every increase in resistance to the flow of air, and increases to a maximum when there is no pipe in place. Obviously, when the wheel is unnecessarily wide and the pipe does not carry all the air that the blower is designed to deliver at the pressure developed, the consumption of power is excessive. To provide against the possibility that the pipe accidentally be torn off the blower, and that the overload release may not act, an unnecessarily large motor must be provided in order to avoid burning up the motor, possibly causing a mine fire. The combinations of blowers and pipes mentioned are designed to give air velocities of 2,000 ft. per minute at the pipe ends under reasonably good pipe conditions. About three hundred blowers are normally in use.

Following Mr. Daly's presentation of Mr. Richardson's article D. Harrington presented a paper on the "Efficient Ventilation of Metal Mines." He remarked: "It is generally accepted that coal miners under the age of fifty are much more free from respiratory diseases than metal miners and it is practically certain that this immunity of the coal miner is due largely to the fact that working places in coal mines are much better ventilated than those of metal mines."

It is interesting to note that Mr. Harrington advised that places temporarily not working or permanently abandoned be sealed by canvas, gunite, concrete bulkhead or otherwise to prevent a loss of the air needed in active workings and to prevent vitiated air from abandoned places mixing with air that is to be used in active workings.

One of the most interesting papers of the session was one by J. J. Walsh, state mine inspector, Nanticoke, Pa., entitled "Coal-Mine Ventilation." Mr. Walsh showed that improvements in ventilation had greatly increased output and had done it without any direct effort on the part of the management. Table II will show the situation in brief.

TABLE II. EFFECT OF VENTILATION ON TONNAGE.

	Before Improving Ventilation	After Improving Ventilation
Mine 1		
Carbon dioxide, per cent	0.50	0.32
Oxygen, per cent......	20.23	20.46
Dry-bulb temperature, deg. F......	68	69
Humidity, per cent......	86	60
Cars filled, per man......	1.443	1.661
Mine 2		
Carbon dioxide, per cent......	0.34	0.15
Oxygen per cent......	20.42	20.60
Dry-bulb temperature, deg. F......	68	59
Humidity, per cent......	95	89
Cars filled, per man......	1.009	1.477
Mine 3		
Carbon dioxide, per cent......	0.37	0.22
Oxygen per cent	20.36	20.54
Dry-bulb temperature, deg. F......	69	68
Humidity, per cent......	85	67
Cars filled, per man	1.169	1.475

The carbon-dioxide reduction and the oxygen increase would not justify the expenditures made to improve the ventilation of these mines. The reduction in humidity and the increase in the speed of travel of the air were the essential changes that resulted in the greater production per man. The carbon dioxide and the oxygen percentages are given solely to show that they were inconsiderable. The dry-bulb temperatures likewise were but little affected.

Mr. Walsh added that each fan should operate its own independent intake and return airway. Where two or more fans operate on the same intake and return, the increase in volume of air circulated does not warrant the expense of installing the additional fan. The volume of air that will flow through a mine depends on the difference in pressure between the intake and return airways. If an exhaust fan the dimensions of which are within practical limits is taking air from a mine with a water gage of 2 in. and cannot furnish enough air. the installation of a second fan on the top of the upcast will not by any means double the quantity of air circulating.

Furthermore, if both fans were so arranged as to exhaust the air from the same shaft, each producing a 2-in. water gage, they would not create a greater difference in pressure between the intake and return than is created by one fan working alone. In fact if the rim speeds of the fans were not equal the volume of air might be reduced by the use of the second fan. We may go still further and say that it is possible, even in practice, for the rim speeds of the fans to be such that one will receive some of its air supply through the chimney of the other.

Booster fans usually are located underground between the intake and the return or at some point in either one of these airways. Their purpose is to help along a feeble air current. Where the movement of the air is broadcast and where much of the air produced by the surface fan is lost by leakage the conditions may demand their use, but a booster fan placed in a mine to assist a fan located on the surface will not increase the total volume of air passing through the mine to any appreciable extent, unless it is more powerful and generates a greater pressure than that generated by the surface fan; neither will it be of any local value unless it generates a pressure greater than that existing at the point of installation.

BOOSTER FANS BOOST ONLY CONSTRUCTION COSTS

Fans placed in tandem, one at the top of the upcast shaft (exhausting) and the other at the top of the downcast shaft (blowing), are of little value to each other. Assuming that an exhaust fan is producing a 2-in. pressure, if a force fan is placed at the top of the downcast shaft and run at a speed sufficient to generate an equal pressure it is capable of producing a velocity in the downcast shaft only slightly greater than that produced by the exhaust fan working alone. If the rim speed of the blowing fan is increased until the water gage reading is 3 in., while the exhaust fan remains the same, the velocity of the air will be increased. This increase is maintained entirely by the blowing fan, because the velocity in the air is greater than that which the exhaust fan with its 2-in. pressure is capable of producing.

The belief is quite general that two fans working in tandem or two fans exhausting at the top of the same upcast, each generating the same water gage, will deliver twice as much air as one of them working alone; this however, is not true. In order to double the quantity of air flowing through the same intake and return, the pressure must be increased four times and the horsepower eight times.

HOW VOLUME OF AIR CAN BE DOUBLED

The volume of air flowing through a mine can be doubled, however, by the application of twice the horsepower if the ventilating units are independent of each other; that is, by the installation of two fans, each having its own intake and return.

A communication was read from F. H. Kohlbraker, superintendent of the Susquehanna Collieries Co., sustaining the statements made in Mr. Walsh's paper. H. H. Stoek desired to know whether experiments into coefficients of friction were being made or could be satisfactorily made, on a laboratory scale. George S. Rice said that J. W. Paul, of the Bureau of Mines, was investigating this subject at the Pittsburgh station. Mr. Paul stated that it had been found difficult to get reliable results because the air will not travel in straight lines and consequently the pitot tubes do not record correctly. In order to compel the air to flow straight, a honeycomb of tubes 15 ft. long had been introduced into the airway. The measurements will be made by a Whalen gage which will register one ten-thousandth of an inch of water gage.

Mr. Harrington said that small quantities of carbon dioxide and small deficiencies of oxygen might be unimportant in cool dry air but in humid hot air they might be far more deleterious. Mr. Walsh argued that the main points were the humidity and the heat and declared that at a temperature of 106 deg. without ventilation, life would become extinct. The temperature of the body would soon arrive at that of the atmosphere with fatal results. Mr. Walsh, discussing the relation between health and humidity, said that in a certain mine where influenza was epidemic, when the humidity was between 75 and 80 per cent, 61.6 per cent of the men had influenza; when it was between 80 and 85 per cent, 62.6 per cent were thus afflicted; when between 85 and 90 per cent, 52.4 per cent had that disease; when between 90 and 95 per cent, 39.2 per cent, and when between 95 and 100 per cent, 18.5 per cent.

CONCRETE WATER BOXES

These are placed in the corners of the airshafts in the Butte mines. They offer a minimum resistance to the flow of air.

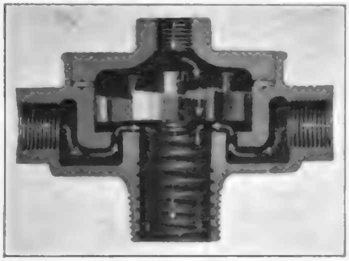
In a subsequent meeting Mr. Daly explained that the main shafts had been gunited and the upcasts covered with concrete slabs. Asked why the main shafts have been treated with the cement gun he declared that this left the shape of the timbers exposed so that any rocks that might fall would bound from side to side, breaking their fall and saving the bonnet of the cage from injury. The bonnet would be readily pierced by a rock falling freely from the top of the shaft to the bottom. In fact it was customary to keep the gunited timber rings covered with dust so as to protect the gunite from falling material. The return was not gunited, as the object sought was to mask the timbers. However, it might be suggested that by the use of gunite properly backed the same result could be obtained and the shaft thus protected would be far more fireproof, for surely the fire can get behind the concrete shields that have been provided.

Cylinder Drain Valve That Is Always Open When Needed and Closed If Not Needed

ALL condensate should be carefully drained from the cylinders of reciprocating engines and similar equipment. If the cylinder cocks are not opened when starting an engine, the cold cylinder walls may condense enough water from the steam to cause trouble. This water is forced into the clearance space of the engine at a time when the exhaust is closed and the crank and connecting rod are approaching the toggling point. When this happens, provided enough water is present, it being mobile but incompressible, it either lifts the exhaust valve off its seat and escapes to the exhaust or some part of the engine must give way. As a rule the part to give is the cylinder head. Sometimes, however, if the water accumulates in the forward end of the cylinder, the piston is pulled off the piston rod or the rod is pulled in two.

One great objection to the ordinary cylinder cock or drain valve, particularly on stationary engines, is that they are forgotten and are left open after the engine has been brought up to speed and is thoroughly heated up. This allows much steam to blow to waste.

To overcome these difficulties and render it possible for the engine driver to safely forget cylinder drainage the automatic relief valve shown in the accompanying illustration has been developed. This consists of five parts—a body, a cover, a gasket, a valve disk and a spring—only one of which is movable.



CYLINDER DRAIN VALVE SEATS UNDER STEAM

When steam is off or not up to the standard pressure, the spring forces the valve off its seat and the condensate from the cylinder flows through the valve to waste. Thus the condensate cannot be shut within the cylinder when the engine is working.

As may be seen in the illustration, the top of the device is connected to the steam chest or to the live steam at some point between the throttle and the engine valve. The two side openings are connected to the two ends of the cylinder and the bottom outlet leads to the drain. In the lower opening is placed a spring that bears against the movable disk above. This spring is screwed into a groove within this opening and consequently its tension may be adjusted without difficulty.

The top of the disk, of course, is subject to the pressure of live steam whenever the throttle valve is open. When the throttle is closed, however, the steam above this valve disk condenses, relieving the pressure. Accordingly the valve lifts, allowing this condensate to flow to waste. When the engine is being warmed up preparatory to starting, the pressure of the steam, which is, or should be, admitted slowly at first, is not great enough to force the disk onto its seat, so that the cylinder is effectively drained of the condensate. When the steam is turned on fully, of course, the disk seats automatically.

Should a quantity of water accumulate at any time in the engine cylinder it will be forced to the drain valve, lifting the disk off its seat and relieving the pressure. The lifting disk is so constructed that at each opening and closure it revolves slightly. It is thus self-grinding and always tight.

This device is known as the improved Diel-More automatic drain and relief valve, and is being distributed by the Diel-More Sales Co., Bourse Bldg., Philadelphia, Pa.

Experts Debate Value of Storage-Battery Locomotives in Gathering Service

"STORAGE-BATTERY Locomotives as Applied to Mine Haulage" was the sole paper applicable to coal mining read at the second of four mining sessions held during the meeting of the American Institute of Mining and Metallurgical Engineers. This paper, by Charles E. Stuart, appeared in *Coal Age* Feb. 16, 1922, on pages 277 to 284.

Howard N. Eavenson, in discussing Mr. Stuart's paper, said that when the coal measures are 5 ft. thick or over and the grades do not exceed 8 or 9 per cent, mules are preferable to storage-battery locomotives.

Under the most favorable conditions a two-mule team with a driver can gather as many as 75 to 100 cars in eight hours. During the last few years, however, such a team would gather on an average only 30 to 35 cars and in 1921, when efficiency fell to its lowest level, only about 30 cars would have been gathered. Mr. Eavenson said that he had never operated any type of gathering locomotive that would gather more than twice this number.

Mr. Patton, in response to a question as to the maximum grade a storage-battery locomotive could be operated on, said that he was in charge of the tests at the Lynch plant when the results were obtained which are tabulated in Mr. Stuart's paper. (This table is to be found on page 280 of the *Coal Age* reprint of that article.) In one of the rooms the locomotive pulled two mine cars weighing 9,600 lb. against a 17.5-per cent grade.

Mr. Eavenson then added that wherever a locomotive could gather two mine cars at a time it would give better results than a mule. Graham Bright said that he did not think it advisable to use storage-battery locomotives in those mines which had use for no more than three, for it would be too expensive to engage an expert to take care of them. When enough are used, however, to make it pay to engage such an expert they will be found preferable to trolley locomotives.

In referring to the combination locomotive equipped with two motors, one driven by power from a storage battery and the other by trolley current, he said that the system used would not be as satisfactory as to use two motors so connected that when being operated on trolley they would be in series and when on battery they would be in parallel.

COAL AGE INDEX

The indexes to Coal Age are furnished free to all who ask for them. The index for the last half of 1921 is now ready for distribution. A copy can be had by addressing a postcard to the subscription department of Coal Age.

American Institute of Mining Engineers Studies Systematic and Total Recovery of Mine Pillars

Extraction Figures Usually Too Large—Destruction of Roads and Railroads—Accidents from Pillar Drawing—Correct Extraction Ratios from 67 Pocahontas Mines—Small Pillars with Speedy Extraction Tried Out Satisfactorily

A DECLARATION by H. H. Stoek that bituminous operators were deceiving themselves as to their percentage of extraction was the opening feature of the fourth meeting of the mining section of the American Institute of Mining and Metallurgical Engineers. He declared that one ton in two probably was wasted even now and that the declaration that "for every ton of bituminous coal mined in the United States a ton of pillar coal had been left in the mines" probably was quite true at the time it was made.

Mr. Stoek said that this loss of coal had been accompanied by a loss of life per thousand men employed that was higher than in any other of the leading coal-producing countries. He was aware that the United States had a lower loss of life per ton produced, but, he added, we merely beg the question and attempt to bolster up a bad condition when we adopt a peculiar unit for the statement of our accidents.

Quoting George S. Rice, he advocated the use of factors of recovery rather than of factors of loss because the statement of a loss arouses antagonism and, still quoting him, Mr. Stoek referred to the losses caused by "the natural, commercial and labor conditions, the requirement in many cases of boundary pillars under railroads and buildings which may be called for in the deed or lease, or, in the absence of a specific exemption in these documents, the common law requirement that a surface owner is entitled to the support of the surface."

REPORTS OF EXTRACTION VARY WIDELY

Mr. Stoek said that his inquiries in 1905 had shown percentages of extraction between 70 and 95 per cent, but doubtless they were too high. In 1914 A. W. Hesse gave the percentage of extraction as being between 55 and 97. The bulletins of the Illinois Coal Mining Investigations in 1915 gave the extraction for Illinois as between 41 and 96 per cent. An average of thirty panel mines gave 55 per cent and an average of forty-eight pillar mines 54 per cent.

In 1914-15 a committee reported that in a certain mining district about 65 per cent of the coal was being recovered. A subsequent survey of twelve of the largest mines in the district made by a number of engineers gave percentages of extraction varying from 37.7 to 49.5, or an average of 41.4 per cent. This large reduction in the estimate was due to the fact that in the first calculation the area excavated was alone considered and no allowance was made for 1½ ft. of top coal left in the shale roof. As the coal averaged 7.46 ft. in thickness the loss was 16 per cent from this alone.

In these mines it was hoped, when the survey was made, that much of the pillar coal would be subsequently recovered, but during a period of six years little of it has been mined and the indications are that little of it can be saved in the future. The pillars have been so weighted and crushed that they would furnish but little coal and the hauling of such as there is would interfere with the transportation of the coal from the advance workings and so would reduce the daily output. This condition is one that is likely to obtain in mines which, like those here described, have a large production and have left pillars for future mining. Unless pillars are recovered quickly and pillar drawing forms part of the original planning, little pillar coal can be recovered.

Speaking of the obstacles which prevent the introduction of the Connellsville method into Illinois, Mr. Stoek pointed out four difficulties: (a) The coal is not intended for coking and therefore must not be crushed; (b) the labor is unionized; (c) the men may not be shifted from place to place and work therefore cannot be concentrated at the points desired, for each man demands his own room and not to be shifted once he is in it; (d) yardage has to be paid for as narrow work.

HORACE F. LUNT

Commissioner of Mines, Bureau of Mines, Denver, Col., who with B. F. Tillson presided at the joint session of the National Safety Council and the American Institute of Mining and Metallurgical Engineers.

Mr. Stoek said that the railroads were seriously considering the value of the coal under their rights of way where these are underlaid by coal and is still held by them or leased to coal companies. In a circular in the report of the subcommittee of the President's Conference Committee upon the "Federal Valuation of Railroads in the United States" dated Nov. 1, 1921, an estimate is given of the percentage of coal that must be left at various depths to support the surface. This appears in this article as Table I, on the next page.

TABLE I. PERCENTAGE OF COAL NEEDED TO PROTECT RAILROADS FROM SUBSIDENCE

Depth Below Surface, Feet	Percentage Recovery
0 to 50	100
50 to 100	70
100 to 200	60
200 and deeper	50

This table, says Mr. Stoek, is open to serious objections, as it takes no account of the character of the overlying material, and the results in Illinois, at least, show that 50 per cent of the coal left at a depth of 300 ft. and more may not prevent subsidence. In the near future the question as to what will constitute a proper support for public highways also may arise in view of the large sums being spent for hard roads throughout the United States.

Mr. Stoek added: "Although statistics are not available regarding the relative numbers of accidents in pillar drawing and room work, many inspectors connected with liability-insurance companies and operating officials have expressed the opinion that there are no more accidents in pillar work than in ordinary room-and-pillar workings and that while such work requires careful workmen, often they are not unusually skilled."

An interesting note in Mr. Stoek's paper is to the effect that the mine law in West Virginia relating to the spacing of crosscuts has been interpreted to mean that openings shall be 80 ft. apart, but that it is not necessary that this distance be found on any one side of the working place. Crosscuts have to be provided every 80 ft. on one side or the other of the room. Thus crosscuts which in other states would be said to be 160 ft. apart are regarded as 80 ft. apart in West Virginia. This makes it easy to leave a more adequate pillar.

Actual Figures on Pocahontas Recoveries

Mr. Clagett then presented his paper on "Systems of Mining in the Pocahontas Field and Recoveries from Them." As *Coal Age* expects to publish this paper soon it will be only briefly described. The author shows the way in which the Pocahontas operators drifted from one method to another in pursuit of the system of mining that would afford the largest percentage recovery at minimum mining cost and wound up by showing how percentage of recovery per acre-foot increased with decrease of coal thickness and that the mines opened between 1883 and 1890 had to date a recovery per acre-foot from the area mined out of under 80 per cent, but that the mines opened between 1911 and 1920 had recovered per acre-foot over 90 per cent of the coal in the ground. The figures given cover 94 per cent of the total production of the Pocahontas field.

E. J. Newbaker, of the Berwind-White Coal Mining Co., gave an account of the extraction at Winber, and Mr. Browning gave some figures regarding the recovery at the mines of the Solvay Collieries Co. These recoveries run 95.5, 89.7 and 92.4 per cent. Frank Haas declared that he believed that care should be taken not to put excessive emphasis on 100-per cent extraction. Much of the coal must be left—some for boundary pillars, some for the protection of gas and oil wells, and also some for common roads and railroads. Furthermore, where only 5c. profit can be made from the coal on extraction it does not pay to spend an extra 50c. for timber merely to be able to boast about a 100-per cent recovery.

G. S. Rice pointed out that, contrary to Prof. Stoek's statement, it was often found that the coal in pillars could not be maintained as clean as coal from rooms. Weight on the pillar columnized the pillars and the column fractures extended through the binders as well as through the coal, breaking up the impurities into small pieces which it was almost impossible to eliminate in the mine or on the picking table. He believes that rooms should not be driven till it is convenient also to draw the pillars. When pillars are left standing, not only the rooms but also the headings are filled with falling rock. The Bruceton experimental mine, near Pittsburgh, has been exposed to severe explosions and yet has stood with little or no caving for about ten years. Mr. Rice declared that in his belief this is due to the fact that practically no rooms have been driven and in consequence the roof in the roadways has been but little exposed to strain. Heavy falls had occurred, however, in the roadways of all the mines adjacent to that at Bruceton.

Are Pillar Workings Unduly Dangerous?

R. N. Hosler, of the Coal-Mine Section of the Pennsylvania Compensation Rating and Inspection Bureau and president of the Coal Mining Institute of America, declared that investigations made in the bituminous regions showed that more accidents per man employed occurred in pillar drawing than in room driving. Referring to Table XXII of the "Statistical Analysis of Coal-Mine Accidents, 1916 to 1920 Inclusive," he declared that the fatalities from falls of roof and coal were 1,231; of these 163 occurred in the entry beyond the last crosscut, 644 in working places, also in advance of the last crosscut, and 424 in pillar drawing. As only 20 per cent of the men mining coal were working on pillars it seemed that their fatality rate was unduly high, as it composed between 34 and 35 per cent of all fatalities from falls of roof or coal.

Time being limited the discussion was postponed, and D. C. Ashmead's paper "Can Anthracite Mines Be Operated Profitably on More than One Shift?" was presented. R. V. Norris said that valuable byproducts of the paper were the charts showing the number of men employed in mines of various sizes. This would prove quite useful in determining whether the practice at any mine was below or above the average standard, a criterion which had heretofore been lacking.

W. B. Daly presented E. M. Norris's paper on "Underground Fire Prevention by the Anaconda Copper Mining Co." and H. J. Rahilly's address on "Mine Fires and Hydraulic Filling." In commenting on the first paper he said that the mines were patroled after the men had left them as a protection against incendiarism and carelessness, that there were eighty helmets maintained and 500 men had been trained to use them. Fourteen or fifteen fires had occurred since this force of men had been trained and equipped, but they all had been extinguished in a few hours owing to the completeness of the provision for meeting them. At the North Butte fire some years back 162 lives had been lost by a short-circuit in a timber shaft. The company hopes to avoid this hazard by the guniting of the main shaft and the covering of the airshaft with concrete slabs. This work has already been done. There were water lines in every level and at some of the working faces.

As for hydraulic filling, Mr. Daly said that it had been proved that water when applied clear made channels through the open area and so did not put out the fire. By silting the whole area was completely filled with material, thus shutting out air. Horizontal timbers were not only coated above and at the side but the silt came up from below and made a really tight job.

Frank Haas commented on the speed with which air was forced to travel up the Parnell airshaft. He regarded 1,300 ft. per minute as a limiting speed. Mr. Daly said that while 2,500 to 3,000 ft. per minute was the speed in airshafts, a velocity of from 300 to 400 ft. per minute was used in the mine roadways.

After lunch the meeting was again called to order and discussion continued relative to pillar recovery. Mr. Eavenson questioned Mr. Stoek's statement that large pillars were needed for large percentages of extraction, saying that small pillars with rapid extraction were being tried in the Connellsville region. The experience has been successful where the cover is about 250 ft. thick. A trial of the system will be made under 450 ft. of cover. Narrow rooms 10 or 11 ft. wide are driven for a distance of 250 ft. with 32-ft. centers. Then two 6-ft. slabs are taken off one side and one 6-ft. slab on the other. This is done quite rapidly with a machine, and the coal is loaded out before the roof has an opportunity to fall.

A PILLAR ROOF LESS UNCERTAIN THAN ROOM ROOF

Mr. Stoek expressed his surprise at Mr. Hosler's figures, which were contrary to what he had been led to believe. Mr. Eavenson was quite of the same opinion, saying that when undermined in room working the kettle bottoms in the mine roof tended to stay up for a while, descending later, without warning on any unfortunate who might happen to be beneath them. They were not so treacherous when over a pillar, where they gradually got more or less loose in course of time. When the pillar was shot they came down with the coal and were harmless.

R. D. Hall said the same probably was true also of heavy draw slate, which, being free of the main roof, would fall with the coal, and therefore was no longer menacing. In fact everyone seemed in accord with Mr. Stoek, though Mr. Hosler seemed to have the advantage with his figures. It may be noted that Mr. Hosler's statistics had to do solely with Pennsylvania bituminous coal. Hence the suggestion that they were unduly affected by the fatalities in heavily pitching thick anthracite was not justified. For those who are interested it may be said that in the anthracite region the working-place fatalities from falls of roof and coal were 864 as against 285 in pillar work, a ratio of a trifle over 3, whereas the falls-in-room-work fatalities in the bituminous mines of Pennsylvania were 644 as against 424 in pillar work, a ratio of about 1.5, about half that for anthracite mines. As much second mining is being done in the anthracite region it would seem that pillar work is safer than room work in anthracite mines, and room work safer than pillar work in the bituminous region of Pennsylvania.

Mr. Eavenson briefed Erskine Ramsay's report on Alabama extraction and Mr. Hall the paper on "Mine-Timber Preservation," by R. R. Hornor and G. M. Hunt, the former being mining engineer of the Bureau of Mines and the latter in charge of the section of wood preservation, U. S. Forest Products Laboratory, Madison, Wis. The authors said that "Coal mines in the anthracite region of Pennsylvania, where twenty to twenty-five years ago the best grades of white and red oak, chestnut and pitch-pine timber could be obtained locally, now have to depend for mine timber upon an inferior quality of Southern loblolly and second-growth yellow pine. Although the first cost of this inferior timber is relatively small, yet when the cost of freight coupled with the comparatively short life of such timber is taken into account, its use is expensive. It is essential, therefore, that the natural life of these varieties of timber be prolonged by some method of preservative treatment.

"Decaying and punky timber, especially where the bark has not been removed, is a considerably greater fire menace than sound peeled timber. Therefore any steps taken to prevent mine timber from decaying will lessen the fire hazard. It is a well-established fact that peeled timber is more durable than unpeeled timber, and it is stated by one authority that the life of timber placed in dry workings may be increased 10 to 15 per cent by peeling. Bark acts as an impervious coating and retards the loss of moisture from timber, thus making the conditions more favorable to fungus attack. It also offers an excellent breeding place for many wood-destroying insects, which not only weaken the timber but cause it to decay more rapidly. Other considerations favoring peeled timber are that it usually is less inflammable than unpeeled timber, and where it must be shipped for any considerable distance by rail the peeling at point of shipment will effect a saving in both freight and cost of handling by reducing the weight from 6 to 10 per cent of the original green weight. Furthermore, timber which is to be given a preservative treatment must be thoroughly peeled before it can be successfully treated. Even a slight amount of the inner bark adhering to the timber often will cause imperfect treatment results.

"Seasoning mine timber, like peeling, has a number of advantages which may be stated as follows: (1) Increases the strength and in some cases the durability; (2) decreases the weight and thereby reduces the cost of freight and handling; (3) protects from insect attack and decay before the timber is placed in service, and (4) makes the timber more easily susceptible to preservative treatment.

SEASONED TIMBER MUCH STRONGER THAN GREEN

"Actual tests have shown that thoroughly air-seasoned timber has 25 to 50 per cent greater strength than green timber. This increased strength is a decided advantage for mine timbers, as the maximum strength is required when the timber is taking the initial weight of the ground. It is claimed by some that the life of seasoned mine timbers when placed in dry and well-ventilated places will be considerably longer than the life of green timber, while others hold that green timber for mine purposes is as durable as seasoned timber. From numerous observations made by one of the writers in a number of metal mines of the West, he is of the opinion that under most conditions the thoroughly seasoned and peeled timber is more durable than green timber for the reason that it reabsorbs moisture slowly and therefore is more resistant to fungus attack than green timber.

"Perhaps one of the greatest advantages to be derived from the seasoning of mine timber is the saving in the cost of freight and handling. To effect this saving the timber must, of course, be seasoned at the point of origin. It has been shown by experiments conducted by the Forest Products Laboratory that air-seasoned mine ties and props up to 11 in. in diameter lost in three months' time from 15 to 35 per cent of their original green weight, depending on size and variety of the timber. Air seasoning is not usually complete in large timbers in less than 1 or 2 years, but in general much of the advantage of seasoning is realized in 3 to 6 months, depending upon locality and the kind of timber.

"Timber storage usually is not given the attention it deserves. Proper storage is essential for proper seasoning, also for preventing undue checking and incipient decay before the timber is placed in service. Timber yards should be well drained and free from vegetation and decaying wood. The timber should be placed on skids raised a foot or more from the ground, and should be so piled as to insure free circulation of air.

"The following economies resulting from the use of treated timber are enumerated: (1) Reduces cost of maintenance and thus effects a saving in labor and timber; (2) inferior grades of timber may be utilized, which usually are cheaper and more accessible than the more durable grades; (3) reduces loss from delays and interrupted production often caused by timber repairs and renewals; (4) saves cost of supervision and overhead expenses due to repairs and renewals, and (5) lessens timber consumption per ton mined and consequently lessens the cost of production per ton.

In regard to zinc chloride Hornor and Hunt declare: "It is a metallic salt, soluble in water in all proportions. Solutions of about 3 per cent to 5 per cent strength are used in making timber treatments, but in order to reduce freight charges it is usually shipped in the solid form in air-tight iron drums, or in 50 per cent solution in tank cars or drums. The importance of this salt as a wood preservative and its general wide use in this country are indicated by the fact that practically 50,000,000 lb. were used for preserving wood in 1920.

"The quality of zinc chloride used in treating work is indicated by the following specification which has been adopted as the standard of the American Wood Preservers' Association: 'The zinc chloride shall be acid free and shall not contain more than 0.1 per cent iron. Fused or solid zinc chloride shall contain at least 94 per cent chloride of zinc. Concentrated zinc chloride solution shall contain at least 50 per cent chloride of zinc.'

Zinc Chloride Stable in Railroad Ties

"On account of its solubility in water zinc chloride is not as suitable as creosote for use in very wet places. Its principal use has been in the preservative treatment of railroad ties, and its proved effectiveness for this purpose shows that it does not wash out of the wood very quickly even when exposed to the weather.

"The chief advantage of zinc chloride is its cheapness. One-half a pound of zinc chloride per cubic foot of wood is the amount ordinarily injected. At present prices this amount costs only about 3c., whereas creosote is much more expensive. Other advantages are its cleanness, its lack of odor and color, convenient shipment and storage and absolute freedom from fire hazard. Zinc chloride cannot be considered as a fire retardant and there is no evidence that it decreases the inflammability of wood. On the other hand, it certainly does not increase the inflammability of the wood, and like creosote, it keeps the fire hazard at a minimum."

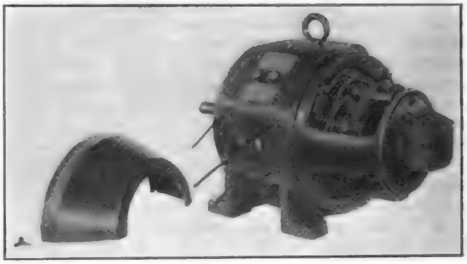
Several speakers, including R. V. Norris, referred to the increased life of timber that always results from its immersion in sulphate mine waters, either iron or copper sulphate, and said, as did the authors of the paper, that this method of preservation, especially in copper sulphate, was being used at some mines with excellent results.

Direct-Current Motors for Pump Driving

CHANGES are being made in direct-current electric motors to adapt them to the work of driving mine pumps where roof water and unfavorably moist conditions are encountered. The design and construction of these machines are the results of an extensive investigation into the conditions under which such pumps operate.

Motors of six different sizes and ratings, in all of which the design and build are standard, have been constructed by the General Electric Co.. They are all compound-wound with approximately 15 per cent series winding. They have four main-field and two commutating-field poles, all of which are laminated and bolted to the frame, which is of cast steel, octagonal in shape, and provided with a large hole in the bottom to afford drainage. The leads are brought out through heavy insulating bushings to a connection plate on the side of the frame. Stamped markings on both the bushings and the connection plate above each lead show the external connection for both directions of rotation.

Not intended to run totally inclosed, yet as a protection against dripping water, these motors are provided on the commutator end with a half-cover of sheet metal, the top of the shield on the pinion end being solid. Another detail in this motor is the large housings on the end shields for the motor bearings. These have provision for waste packing. The end shields carry the brush-holder studs and bearing housings. These latter are interchangeable on all types except one, the 230-volt machine, which requires larger brushes.



PUMP MOTOR REDESIGNED TO SUIT WET CONDITIONS

Motor is provided on the commutator end with a half-cover of sheet metal, the top of the shield on the pinion end being solid.

On all sizes except the 550-volt motors, the end shield carries the brush-holder studs. The large commutator on the 550-volt motor requires a special bracket, which likewise is secured to the end shield. Thus, by moving the entire shield, the brushes are shifted, the bolt holes being drilled large enough to allow the necessary rotation. When the proper position of the brushes has been determined the shield is doweled to the frame and the bolts tightened. The brush holders are specially designed and so constructed as to prevent chattering or the rocking of the brushes within the holders.

Armature construction is the same for all sizes except in the three smaller machines. Here the punchings are assembled directly on the shaft instead of on a sleeve, as is the practice in the larger sizes. All these machines have open slots and coils of the pre-heated form-wound type. This type of coil makes it easy to repair the armature when needed. Both the field and armature coils are impregnated with moisture-proof compound as a protection against dripping water and dampness.

Problems of Operating Men

Edited by James T. Beard

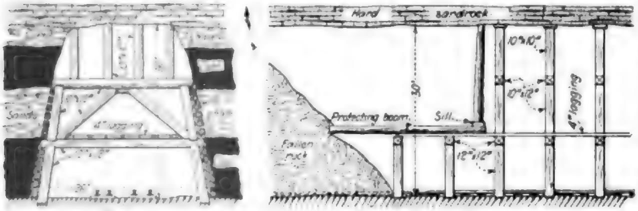
Timbering High Cave on Roadway

Fire Causes Heavy Fall of Roof on Haulage Road—Special Form of Timbering Required to Reach Sandstone Thirty Feet Above Rail—Boom Used to Protect Workmen Removing Fall

NOTICING the interesting article of Alphonse F. Brosky, *Coal Age*, Dec. 8, p. 923, describing methods of supporting roof that has caved to a considerable height on a roadway, it occurred to me that a brief account of our own experience in that line would be of interest.

The inclosed sketch will serve to make clear the condition with which we had to contend and the method of timbering adopted to secure the roof, in removing the fall and making the road safe for haulage.

This style of timbering was found very satisfactory. The fall occurred on a main haulage road and was the result of a fire that caused the roof to cave to a height of 30 ft. above the rails. The width of the opening was also increased to 26 feet.



Cross Section   Longitudinal Section

SHOWING METHOD EMPLOYED TO SECURE ROOF OVER HIGH FALL

As shown in the figure, there were two seams of coal separated by a few feet of sandy shale, which is soft and comes down easily. Although the upper seam forms an excellent roof in working, as the result of the fire that fell also, together with the soft shale above the upper seam.

Effect of Fire on Hard Sandrock Made It Unsafe

Fortunately, the rock overlying that seam was a hard sandstone, which ordinarily stands well. However, as it had been subjected to a strong heat it seemed best to support it with timbers and, for that purpose, the form of framing shown in the figure was adopted.

The material that caved was very hot and the air in the entry was bad. For that reason, the men working to remove the fallen mass were obliged to wear breathing apparatus; otherwise they could not have lived in the atmosphere of the place.

Heat and Smoke Make the Work Difficult

Owing to the heat and the smoke above the fall, it was possible to set in place only the lower deck of timber frames near to the fall. The second deck of timbers was placed above these; but that work had to be kept at a distance back from the edge of the fall.

Naturally, the heated air and smoke hung high in the roof, which made it impossible for the men to see to perform the work of setting the upper timbers at a closer range in the heading.

As quickly as the first deck of timbers was extended, lagging was placed behind the legs, on each side of the road, to give support to the ribs. Also 4-in. planking was laid over the collars to protect the men from any loose pieces of rock that might fall from the roof.

As a further protection for the men who must work beyond the last set of timbers, it was found necessary to use long timbers or booms laid above and resting on the lower deck of timbers. As shown on the right of the figure, the ends of these booms were held down by long posts set on a sill running across the ends of the booms. These posts extended to the roof. This saved at least two accidents that might have proved fatal.

As the upper deck of timbers was put in place, each timber-frame was tightly wedged and the lagging supporting the ribs was carried up on each side, after the manner shown in the figure. Above this second deck short posts were set against the sandstone roof. The work of timbering this piece of roadway has since proved eminently successful.

A. C. Watts.
Chief Engr., Utah Fuel Co.
Salt Lake City, Utah.

Removing Gas by Boreholes

Specific gravity of methane being less than air that gas filling the borehole produces an air column equivalent to a water gage greater than that due to the ventilating pressure.

IN the issue of *Coal Age*, Feb. 16, p. 292, "Student" of Brownsville, Pa., asks for information on the removal of gas by boreholes. Judging from his remarks he has seemingly overlooked a very important factor in this problem.

It should be remembered that explosive gas is generally lighter than air; and, in the case of pure methane, the gas is only one-half the weight of air, at the same temperature and pressure. With a borehole, say 300 ft. deep, the difference in specific gravity between methane and air would be equivalent to a trifle less than a 2-in. water gage, which is above what is ordinarily encountered in mine work, at such a point in the ventilating system.

As a practical proposition it has been my experience that a borehole will deliver dangerous gases, irrespective of whether the fan is blowing or exhausting. It might be of interest to this inquirer to refer to *Coal Age*, Vol. 5.

Frank Haas,
Consulting Engineer.
Fairmont, W. Va.

Attention to Timbering

To reduce accidents start at the timbering of the working face—Employ systematic methods—Judgment of miners not reliable—Cut timbers on surface—Stop a miner's turn who does not timber his place properly.

WITH much interest I read the letter of George Edwards, *Coal Age*, Dec. 15, p. 968, entitled "Safe Rule in Timbering." The line of thought therein expressed should appeal to all men who have the welfare of their miners at heart.

The fact is well known that most of the accidents, in our mines, are caused by falls of coal and rock at the working face. Here, then, is the place to start, if we are to accomplish anything in reducing the number of these accidents.

So large a number of miners are injured every year in this manner that any appreciable reduction in the number of accidents at the face will be money saved. To my mind, there is no better method of handling this phase of coal mining than to adopt a systematic method of timbering the coal face in a mine.

What then is meant by "systematic timbering" at the face? There are numbers of mining men who will not listen to any argument in favor of adopting a uniform set of rules governing the timbering of working places. They reason that every miner should be able to keep his place safe, provided the mine foreman and his assistant inspect these places regularly while the men are at work.

Taking the Gambler's Chance

With Mr. Edwards, I feel that the class of miners that are willing to take a "gambler's chance," in the timbering of their places, are growing fewer every year. The men in charge of our mines, today, are far less prejudiced than formerly and the result is that more systematic rules are being established every day.

It has always been my practice to establish rules, for timbering working places, that would make the worst places in the mine safe. I am then sure that there will be no trouble in other places where the conditions are more favorable. My experience is that the majority of miners are not to be relied on to use their own judgment in respect to the timbering of their places. On that account, I deem it safe to employ a systematic method of timbering all places. On entering a miner's place, I expect to find it properly timbered according to the rules laid down for the mine.

Mention has been made, by some writers, of miners cutting their own timber, to length, in the mine. In my opinion, this is a job that should be done on the surface. I do not favor the plan of having the timber cut to exact measure in the wood, particularly if this is at a distance from the mine.

Assistants Measure for Timber

My plan has been to have one of my assistants go around in the mine and measure the length of timbers required in the miners' places. The timbers are then cut to that measure in the supply yard, sent into the mine and delivered to the places where they are needed. When this is done, no miner will have any excuse for not timbering his place.

Each assistant knows that he is held responsible for the timbering of all places in his district. Should I find that a man has not timbered his place in the manner prescribed by the regulations of the mine, I would stop his turn and no more coal would be hauled from that place, or empties sent in, until the necessary timbers are properly set.

As foreman, I have found a good plan is to vary my visits, so that they will fall when a miner is least expecting me around. This seems to be a necessary practice of foremen, in order to discourage the taking of chances by the miners, and fewer men are killed. What is needed is the strict enforcement of a few good rules in reference to timbering. Ostel Bullock,

Foreman, Liberty Coal Co.

Hillside, Ky.

Many Fail Where a Few Succeed

Ability to lead the key to success—A misfit in an organization can never succeed—The likable man—Keen insight and tact in handling men, chief factors—Power to organize and systematize needful.

WITH feeling interest I read the unfortunate experience of a writer who signs himself "Western Inquirer." He describes the difficulty he has had in getting any one to recognize and appreciate his training and ability.

The lot of this man is not an uncommon one, in coal mining and many other industries, though it is often hard to explain. There is something mysterious about the individual ability to boss. It is a natural gift, depending largely on the disposition of a man, rather than on the training he has received.

Men Who Fail to Harmonize Are Misfits in an Organization

We observe men who have a world of knowledge at their command and are willing to work, but they lack the peculiar quality of leadership. Their personality appears to be so tuned that they cannot harmonize readily with others who are their associates.

One of the most capable mining men I have ever met is a man who has had every advantage, educationally. His father was a big man in the mining world and that alone would have secured for him, from the start, all the recognition one could desire had he possessed a different disposition, which was his one drawback.

This young man was a misfit in the organization to which he belonged. There was no question as to his being a star, so to speak, by reason of his father's position. But unconsciously perhaps, he bore toward everyone a natural feeling of superiority.

At every turn, he showed a lack of sympathy for others' views and opinions. Though wholly natural, this attitude toward his fellows made him out of tune with all his associates. He was, in every sense of the word, a misfit in the organization and his manner was a bar to his own success.

The Likable Man Succeeds

Looking back a few years, I recall another young man in whom I was accustomed to take much interest. As I could plainly see that he would have a hard time getting along, because of certain handicaps, I took him under my wing, so to speak, and gave him every assistance possible.

Socially, the young fellow was as a rat in a strange garret, when among his friends and associates. He could neither dance nor sing, having no knowledge of music. At a social function, he was a wallflower, seldom entering into the activities and enjoyment of the occasion.

Notwithstanding these drawbacks, and hindrances in his disposition, he was a most likable fellow. Everyone liked him and was willing and anxious to help him. He never antagonized anyone or anything. In charge of men, he never spoke a stronger word than, "Put the boots to the fellow if he begins to lag."

My friend didn't go up the ladder of fame quickly, as may easily be supposed. For a long time, he hovered on the bottom rung. Then, one bright day he took an upward start and, from that time, ascended like a skyrocket.

To day, I am proud to say, at the age of 38 he is vice-president and general manager of one of the leading coal corporations of the country. I cite this instance, hoping to encourage some to look forward and upward.

Pikeville Ky. George Edwards.

ANOTHER LETTER

AFTER reading the brief but appealing letter of "Western Inquirer," *Coal Age*, Dec. 29, p. 1055, in which he deplores his inability to secure the position for which he feels he has fitted himself by training, experience and study, I sympathize with him deeply, being practically in the same class myself.

My observation and experience, in recent years, inclines me to think that it does not matter much whether a man has a college education, or must depend solely on his practical experience, to succeed in mining, provided he has the natural ability to perform the particular duties required in the production of coal.

Characteristics That Develop the Successful Foreman

My conviction is that a successful mine foreman must have a natural disposition that will enable him to observe things quickly and be tactful in the handling of men. These qualities are more essential to the present-day foreman than the possession of technical knowledge of mining.

Nowadays, coal companies employ expert aid, in most instances, in estimating on the larger propositions connected with the industry. The same is true, also, in respect to many smaller details that the mine foreman of yesterday was compelled to handle himself.

What is now required of the average foreman is the power to organize and systematize the work in his charge. He must maintain an uninterrupted flow of coal, from the working face in the mine, to the tipple where it is dumped into the railroad cars for shipment.

Because a foreman is given to telling the "funny stories" mentioned by our friend, does not make him any the less efficient in the mine. It will often prove a helpful trait in his character and assist him in securing better work from the men in his charge.

In the coal industry, men have varying ideas regarding the operation of their mines. While some operators prefer a class of trained and technical officials to place in charge, others regard the practical experience and judgment of men as their chief asset.

Foremen Who Abuse Their Men

We find men filling official positions, whose chief characteristics is their ability to use vile and abusive language in dealing with their men. This class of official is at times preferred by some companies, in the belief that such a one can get more work out of his men than a man of a more gentle disposition.

It is these varying characteristics, both in companies and the men they employ, that are a discouraging factor in the lives of many men who have fitted themselves for positions they are unable to secure, after long and protracted effort. **Experience.**

Staunton, Ill.

Fire Prevented by Use of Salt

Entries sealed to extinguish fire—Reopened and salt, used in blasting, has good effect — Omitting to use salt causes another fire — Black powder replaced by permissible powder.

CONCERNING the question of using salt in the stemming when blasting coal in a dry and dusty mine, which has been discussed in *Coal Age*, recently, permit me to give some of our experience in that regard. We were using black powder, at that time, in the mine and had been troubled with fires due to blasting.

One of these fires, in 1919, had made it necessary to seal off two pairs of entries. These were the ninth and tenth north and the main east entry and aircourse, in Mine B, at this place. These entries remained sealed for thirty-one days.

Upon then opening the seals, the entries were cleaned up and we started blasting the coal on the solid, as before. We continued to use black powder, but adopted the plan of placing a 10-in. dummy of salt next to the powder. I should state, here, that the entries were still generating gas, which made it more necessary to take precautions against the occurrence of fire.

Failure to Use the Salt

For a period of 10 months, we experienced no trouble. Then one day, the entrymen shot five holes at one time in the ninth and tenth north, off the east entry. Of these shots one was in the ninth north, two in the tenth north and one in No. 5 roomneck, on the ninth and another in the corresponding room on the tenth north. These shots were fired without any salt being used.

That night the firerunner found three fires, one on the ninth north entry and one in each of the rooms mentioned. Again, we were obliged to seal off those two entries, placing the seals in the same positions as before.

These seals remained in place for six weeks, and it took six months longer to clean up this section of the mine and make it fit for work. Following this experience, black powder was used for a period of four months; but all shots were firsd with salt in the stemming.

Although no fires resulted during that time, it was thought best to use permissible powder, instead of continuing the use of black powder, since we were now installing machines for cutting the coal and producing more dust than before. Up to the present time, no further trouble has been experienced in blasting. State Mine Inspector Morgan, who examined this section of the mine, expressed himself as well pleased with the good results obtained by the use of salt. I want to urge its use. **Pete Boland,**

Herin, Ill. Mine Manager, Mine B.

Inquiries Of General Interest

Is the Mixture Explosive?

The Depletion of Oxygen, in a Mixture of Air and Inflammable Gas, May Be Sufficient to Extinguish a Light and Yet Be Highly Explosive as an Accumulation in a Mine

IN looking over the mine fireboss questions for the State of Indiana, as published in *Coal Age*, Feb. 9, p. 252, permit me to ask if the answer given to the last question on that page is correct. The question reads as follows:

> A chemical analysis of mine air showed the following. Nitrogen, 80 parts; oxygen, 12 parts, marsh gas, 3 parts; stinkdamp, 1 part; blackdamp, 3 parts; whitedamp, 1 part. Is this an explosive mixture? Give reasons for your answer.

The reply to this question states that the mixture is "highly explosive," because it contains 5 per cent of explosive gases; viz., methane (marsh gas), 3 per cent; hydrogen sulphide, (stinkdamp), 1 per cent and carbon monoxide (whitedamp), 1 per cent.

It is my belief that this is an extinctive mixture and, if so, I fail to see how it would burn or explode. The mixture is short of oxygen, the latter being depleted to 12 per cent, and we are taught that an oil flame is extinguished in an atmosphere containing 16 per cent of oxygen. In my opinion, if this mixture had contained 17 parts of oxygen, the 3 parts of blackdamp present would still render it non-explosive. **Thomas Hugo.**

Princeton, Ind.

While it is true that the analysis of the mixture shows the oxygen of the air to have been depleted below what is necessary to support a lamp flame burning oil, such fact does not prove that there is not still oxygen sufficient to burn the methane, hydrogen sulphide and carbon monoxide present, which would cause the mixture to explode if ignited by a flame of sufficient volume and intensity.

It is well known that the complete combustion of one volume of methane requires two volumes of oxygen. Likewise, one volume of hydrogen sulphide requires one and one-half volumes of oxygen to consume it, while one volume of carbon monoxide requires but half a volume of oxygen in burning.

On this basis, the three parts or volumes of methane will require six volumes of oxygen; and the one volume each of carbon monoxide and hydrogen sulphide will consume two more volumes of oxygen, making but eight volumes in all, while the analysis shows 12 parts or volumes of oxygen present.

The chemical reaction that takes place in each of these cases is shown by the following equations:

$$CH_4 \times 2O_2 = CO_2 \times 2H_2O$$
$$2H_2S \times 3O_2 = 2SO_2 \times 2H_2O$$
$$2CO \times O_2 = 2CO_2$$

All that is required to start these reactions is the necessary amount of heat or a flame of sufficient volume and intensity. A lamp flame has neither the volume or intensity sufficient to produce inflammation of this mixture. On the contrary, it would be quickly extinguished if exposed to such an accumulation of gases in a mine.

It should not be assumed that the extinction of a lamp exposed to such a mixture shows that the mixture is non-explosive. A Davy lamp will fill with flame and be extinguished in a mixture of gases and air that is highly explosive.

In regard to the 3 parts (3 per cent) carbon dioxide rendering the mixture non-explosive, it should be remembered that a firedamp mixture, at its most explosive point, requires one-seventh of its volume (say 14 per cent) to produce that effect.

In other words, it requires 14 per cent carbon dioxide to counteract the explosive qualities of 9½ per cent of methane. But, in the present instance, we have 5 per cent of explosive gases and but 3 per cent of carbon dioxide, which is but half sufficient to make the mixture safe.

In addition, it can be said that both carbon monoxide and hydrogen sulphide are more readily ignitable than methane and their presence renders the mixture still more dangerous.

Armature

Kindly answer the following question in an early issue of *Coal Age*, and oblige a constant reader. If the diameter of an armature measures exactly 3 in. and its circumference is divided into twenty-one equal parts, what will be the length of a chord drawn between two of these points that are consecutive? INQUIRER.

———, Pa.

The circumference of a 3-in. armature is $3 \times 3.1416 = 9.4248$ in. Dividing this into twenty-one equal parts gives, for the distance between any two consecutive points as measured on the circumference, $9.4248 \div 21 = 0.4488$ in. The chord substending this arc, however, is somewhat less than the arc itself and is calculated thus.

The angle measured by the arc between any two consecutive points is $360 \div 21 = 17\text{-}1/7$ deg., or $17° \; 8\text{-}4/7'$. From a table of sines and cosines, the sine of one-half this angle is found; thus, $\sin 8° \; 34\text{-}2/7' = 0.1490 \; 42/7$, which multiplied by the diameter of the armature gives the length of the chord joining any two of the consecutive points on the circumference. The length of this chord is therefore, $3 \times 0.14904 \; 2/7 =$ say 0.44713 in.

Examination Questions Answered

Miscellaneous Questions

(Answered by Request)

QUESTION—*What precautions would you adopt to reduce to a minimum the production and distribution of coal dust?*

ANSWER—Make and enforce strict rules regulating the blasting of coal, which should be done by competent shotfirers using only permissible powder. The shotfirers should be authorized to examine, charge and fire all shots that, in their judgment, are safe and will not unnecessarily shatter the coal. Where miners are permitted to charge their own holes the kind of powder used and weight of charge should be clearly specified. Each miner should be permitted to take into the mine only what powder he will require for the day's work. Special instructions should be given each miner in regard to placing his shots. All shots should be mined and sidecut wherever necessary, in order to give the powder a chance to perform its work.

To prevent undue distribution of the dust in the mine, all roads and passageways should be regularly cleaned and no accumulation of dust should be permitted in the working places. In a dry and dusty mine, there is an advantage in using salt mixed with the stemming used for tamping the holes. Good results have been obtained by making up one dummy of salt to be placed next to the charge of powder. This salt is blown into the mine air when the shot is fired. Its absorption of moisture from the air has been found to keep the dust in a damp condition.

QUESTION—*If you were in charge of a mine would you consider it dangerous if dry and dusty at the working face, provided no gas had ever been detected in that section?*

ANSWER—A dry and dusty mine must always be regarded as a dangerous proposition, unless special precautions are taken to dampen the dust to keep it from being distributed throughout the mine and avoid its suspension in the air current. An atmosphere laden with dust is explosive, at times even when no gas is present; but the presence of gas always increases the danger.

QUESTION—*(a) What method of timbering would you adopt in a seam where the roof and bottom are hard? (b) Where the roof is hard and the bottom soft? (c) Where both roof and bottom are soft? State your reasons.*

ANSWER—(a) Where both roof and bottom are hard, some means should be employed to allow for the first settlement of the roof when the coal is taken out as the face advances. One plan is to set each post on a mound of slack or other soft material that will yield in the first settlement. Another plan often adopted is to taper one end of the posts. The furring of the wood, on the tapered end, prevents the destruction of the post when it takes the weight.

(b) When setting a post on a soft bottom a mudsill should be used to prevent the post sinking into the bottom. In this case, as in the first instance also, a soft cap-piece should be used above the post.

(c) When both the roof and the bottom are soft a good plan is to set the post on a mudsill, at the same time placing a good crossbar against the roof and above each post; or use, instead, a wide and long cap-piece of hard wood that will distribute the pressure over a larger surface on the roof.

QUESTION—*Where employees are hauled to and from their working places in mantrips, state what precautions you would adopt and at what rate of speed the trips should travel?*

ANSWER—A mantrip should always be in charge of a competent triprider or motorman, who should have orders to use every precaution to avoid accidents and to run slowly while the trip is passing over switches, on its way into or out of the mine. The trip should not be hauled at a speed exceeding six miles per hour. Before starting, it should be carefully inspected to see that the cars are properly coupled together. No explosives or tools should be permitted to be carried by the men, except such tools as can be placed in the bottom of the car, where they will be out of the way and in no danger of being caught and injuring the men while proceeding into the mine. Under no conditions should explosives, in any form, be carried by the men or hauled into the mine on a mantrip. Should the trip have to ascend an incline, the last car should be provided with a dog that would derail the cars, in case a coupling failed or the power went off the line.

QUESTION—*In working a dusty mine where marsh gas is given off and firedamp generated, what steps would you take to guard against accidents from explosions?*

ANSWER—The mine should be well ventilated with a volume of air sufficient to dilute, render harmless and carry away the gas generated. Strict regulations should be made and enforced to prevent undue accumulations of dust, and means must be taken to prevent the raising of the dust and its suspension in the mine air. The mine must be carefully inspected at frequent intervals while the men are at work in their places. The work must be done by competent firebosses or safety inspectors equipped with approved safety lamps, and the miners should be equipped with electric cap lamps. No open lights must be permitted in the mine. Where the coal is blasted competent shotfirers should be employed, whose duty it will be to examine, charge and fire all shots that, in their judgment, are safe.

QUESTION—*Why is moisture necessary in many of the mines of Alabama?*

ANSWER—Any mine working a soft inflammable coal produces a quantity of fine dust that must be kept moist or in a damp condition to prevent its suspension in the mine air and eliminate as far as possible the chance of an explosion by reason of the ignition of the dust-laden atmosphere. The danger is greater if any appreciable amount of gas is present.

QUESTION—*What conditions would guide you in determining the width of headings in rooms?*

ANSWER—To insure safety and economy of working, depth of cover, thickness and inclination of seam, character of roof, floor and coal, method of working and the means employed to extract the coal must be considered.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

EMPLOYMENT conditions in different sections of the country are revealed, in the Federal Reserve Board's report on business conditions, in part as follows:

"Reports received from the various districts concerning developments in the labor situation during the past month are of a somewhat conflicting character. The latest statements issued by the U. S. Employment Service covering firms employing more than 500 workers show that for the period ending Jan. 1 there was an increase of 4.2 per cent in numbers employed as compared with the end of December. . . . The net increase in numbers employed amounted to 63,400 for the 1,428 reporting firms which were employing 1,556,507 workers on Jan. 31. Since the date of this report, conditions have arisen which have brought about increases in unemployment in certain sections of the country, notably in District No. 1 (Boston), where widespread strikes in the textile mills of Rhode Island and New Hampshire are now in progress.

"In New York State there was a slight decrease of 1.5 per cent in the numbers employed in 1,500 establishments which made reports to the State Department of Labor. The decrease was attributed mainly to seasonal reductions and the closing of factories for repairs. In District No. 3 (Philadelphia) a large number of unemployed was still reported for the six cities of Altoona, Harrisburg, Johnstown, Philadelphia, Scranton and Williamsport, according to the Pennsylvania State Department of Labor. The number of unemployed rose from 232,960 on Feb. 1 to 234,275 on Feb. 15. However, this is an improvement over conditions on Jan. 1, when there were 243,293 unemployed.

"District No. 5 (Richmond) reports that during the past month there has been some evidence of an increase in the numbers unemployed. Street car strikes have been in progress in Richmond, Norfolk and Portsmouth and one has been called in Columbia, S. C. A number of shipyard employees have been laid off in Newport News.

"Special reports made to the Federal Reserve Bank of Chicago show that at the end of January there was an increase of 4.3 per cent in numbers employed by reporting firms as compared with the end of December, although a decline of 5.8 per cent as compared with a year ago occurred. The inquiry covers 205 firms which employed 116,277 men on Jan. 31. The increases in employment were exceptionally heavy in the case of automobiles and accessories, metals other than steel and iron, and agricultural machinery. The respective percentages were 126, 15.1 and 15.2.

"In District No. 9 (Minneapolis) conditions improved during the month of January and special reports made to the Federal Reserve Bank of Minneapolis covering firms employing less than 500 men in Minneapolis and also including mining and lumbering companies in the district showed an increase of 8.2 per cent in numbers employed.

"In District No. 12 (San Francisco) also there were practically no changes during the month of January. In California, Oregon and Washington there was reported to have been 'an improvement in outlook.' Increased activity in lumbering and other industries was absorbing some of the unemployed forces of the district, and in Arizona, Nevada, Idaho, and Utah an increase in mining activity especially in the copper mining districts had occurred. On the other hand, railroad and construction work were reduced in scope."

Railroads Order Equipment

The Baldwin Locomotive Works has received a contract for forty-seven locomotives from the Chicago, Burlington & Quincy R.R. The order is valued at $2,000,000. The Florida East Coast R.R. is reported to have placed an order for ten locomotives with the American Locomotive Co. It is also reported that the road contemplates ordering additional equipment as soon as specifications are in hand.

The directors of the Pennsylvania Railroad Co. have ordered the purchase of 250 new steel cars for passenger service. With the 20 steel dining cars for which orders were recently placed, this means that the Pennsylvania system will be augmented by a total of 270 cars of all-steel construction, which constitutes the largest order for steel passenger cars placed by any railroad so far this year. One of the road's subsidiaries which has operated under separate management, the Long Island R.R., has ordered 50 new all-steel cars for delivery early this year.

Textile Mill Cuts Work Schedule

The Farr Alpaca Co., Holyoke, Mass., the largest textile concern in the vicinity, reduced its working schedule March 7 from six to four days a week, the new schedule to continue until further notice.

Tin Plant Ready to Resume

Operations at the bar mill and open-hearth furnace departments of the N. & G. Taylor tin mills at Cumberland, Md., were reported March 9 to be about to resume in a few days, after a suspension of about a year.

Typewriter Factory Busier

The Royal Typewriter Co.'s factory at Hartford, Conn., has increased its operating schedule 15 per cent. Many of its employees are now on full time.

American Woolen Co. Mills Hum

In connection with the annual report of the American Woolen Co., which shows earnings of $16 per share, it is reported that orders on hand are sufficient to keep the mills of the company operating into the summer months.

Workers in Detroit Double in Year

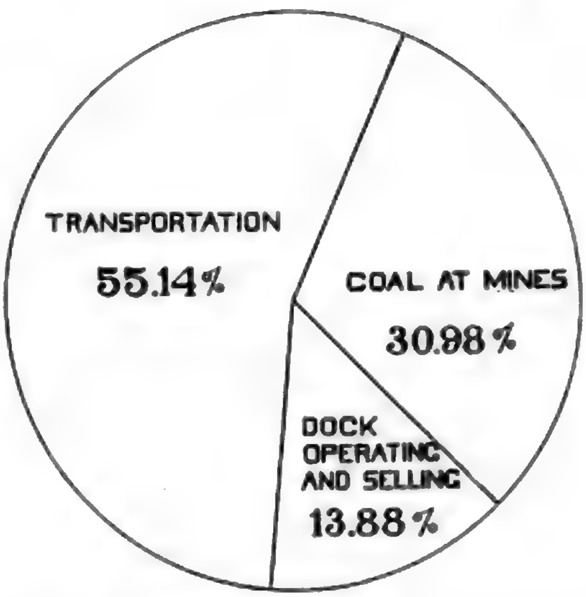
The number of workers employed in the chief industries in Detroit has almost doubled since March 1, 1921, according to a report made public by the Employers' Association. An increase of 8,664 workers was shown for February, as compared to January of this year. The total employed by the seventy-nine manufacturing concerns holding membership in the association was given as 121,763, as against 62,878 a year ago. These plants normally employ 200,000 workers.

Shows Distribution of Costs Per Ton in Supplying Coal to Twin Cities

DISTRIBUTION of costs per ton in supplying Minneapolis and St. Paul, Minn., with West Virginia splint lump coal via the Duluth-Superior docks is graphically shown in a circular entitled "The Coal-Dock Dollar," an idea conceived and illustrated by William H. Groverman. The circular, illustrations from which are shown herewith, is distributed by the Berwind Fuel Co., Minneapolis, Minn., with which Mr. Groverman is now associated.

The cost of the coal at the mines, according to Mr. Groverman, represents 30.98 per cent of the price to the retailer, transportation is responsible for 55.14 per cent and dock operating and selling account for the remaining 13.88 per cent.

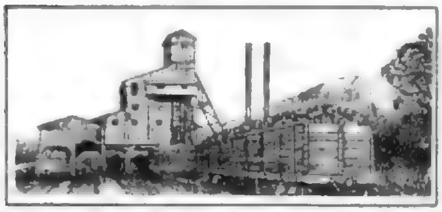
A ton of splint lump, the circular states, costs $2.50 at the mines in West Virginia. Freight charges from the mines to Lake Erie amount to $1.84 per ton, dumping into vessel at this stage costing 8.5c. additional. From Lake Erie to the Duluth-Superior docks the boat transportation charge represents 50c., dock operating and selling involving a further expense of $1.12. Finally, from Duluth-Superior to the Twin Cities the expenditure for freight amounts to $2.02½. For other destinations than Minneapolis or St. Paul the latter charge, of course, will vary. Incidentally, the circular notes, three tons of rescreened lump will produce about one ton of screenings.



THE COAL-DOCK DOLLAR

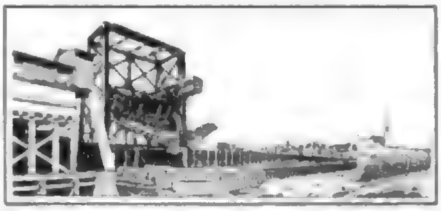
How the dollar paid by the retail dealer in the Twin Cities for a ton of West Virginia splint is divided between cost of coal and of transportation, including boat haul and dock operating charges.

PICTORIAL SUMMARY OF ITEMS OF COAL COSTS IN THE NORTHWEST, FROM MINE TO RETAIL YARD



AT THE MINE WEST VIRGINIA SPLINT LUMP COSTS $2.50 PER TON

RAIL FREIGHT FROM WEST VIRGINIA TO LAKE ERIE, $1.84 PER TON



DUMPING THE COAL FROM CARS INTO BOATS, 8.5c. PER TON

FOR 1,000 MILES ON THE LAKE, BOAT FREIGHT IS 50c.

HANDLING CHARGE AT UPPER LAKE DOCKS IS $1.12 PER TON

FROM DULUTH TO THE TWIN CITIES RAIL FREIGHT $2.02½

Operators in Canadian Rockies End Meeting With Miners and Will Post Lower Scale

NEGOTIATIONS between the Western Mine Operators' Association and the scale committee of District No. 16, United Mine Workers of America, broke up abruptly half an hour after the commencement of a conference, March 4, between the two. No wage agreement could be reached and the conference adjourned sine die. R. M. Young, who is commissioner for the operators' association, said the decision was final. The scale presented to the mine workers at the meeting embodied reductions of from 30 to 50 per cent, and this scale will be posted at the mines of the individual companies, to become operative on April 1, when the present contract shall have expired.

February Hard-Coal Movement Exceeds That Of January by Nearly 400,000 Tons

SHIPMENTS of anthracite during February, as reported to the Anthracite Bureau of Information, Philadelphia, show a substantial increase over the two preceding winter months, for although a shorter month by the calendar, and containing two legal holidays—Lincoln's and Washington's birthdays—the quantity of anthracite shipped amounted to 5,239,014 gross tons, as compared with 4,848,053 tons in January and 4,635,922 in December. More seasonable winter temperature than obtained during January and the making of provision against the possibility of a shortage, should a suspension occur on April 1, both contributed to the increased activity.

Shipments by originating carriers were as follows, in gross tons:

	February 1922	February 1921	January 1922
Philadelphia and Reading	1,160,685	1,170,753	1,052,872
Lehigh Valley Railroad	857,579	1,063,508	766,602
Central Railroad of New Jersey	537,214	515,551	542,558
Delaware, Lackawanna and Western Railroad	755,923	920,788	744,768
Delaware and Hudson Company	670,323	813,191	619,762
Pennsylvania Railroad	402,762	426,350	331,871
Erie Railroad	492,262	633,706	466,495
New York, Ontario and Western Ry.	141,929	153,017	101,779
Lehigh and New England Railroad	220,337	269,237	221,346
Totals	5,239,014	5,966,101	4,848,053

ATTORNEY-GENERAL DAUGHERTY has invited Hoover to join in an effort to lower retail prices. Why not extend an invitation to retailers to participate?—*San Antonio Light.*

Coal Freights to Be Substantially Cut, Is Belief; Butler Quotes Hoover for Reduction

IT is a foregone conclusion that the Interstate Commerce Commission will order a reduction in the freight rates on coal. About 300 witnesses appeared during the general rate reduction hearing. Every important industry was represented, as were the consumers and the public generally. One-sixth of those appearing expressed positive convictions that coal rates should be reduced materially. Only one of the fifty asking for such a reduction represented coal producers. In view of a nation-wide unanimity of opinion that coal rates should come down, there is a general belief that the reduction will be a substantial one.

The importance of the hearing, which has just been concluded, is indicated by the fact that 8,275 pages of testimony were taken down stenographically and typewritten for the use of the commission. In addition there were more than 500 exhibits, many of them quite elaborate.

In summing up the position of the National Coal Association, Rush Butler, its counsel, among other things, told the commission:

"Difficult as it may be to measure with accuracy the beneficial result of a reduction in coal rates, the conclusion is inescapable that without such reduction, a revival of business and industry in the United States is impossible. That all industry is awaiting reduced transportation charges for fuel is demonstrated by the testimony of many witnesses heard in this proceeding. You have listened to the plea for reduced rates on coal presented by the Associated Industries of Massachusetts, by numerous representatives of the iron and steel industry, by representatives of the brick and tile industry, by manufacturers of glass, paper and many other commodities and by the Board of Railway Commissioners of South Dakota, representing the people of that agricultural state. From every section of the country comes the statement that reduced rates on coal will be more helpful than any other reductions that can be made.

COAL INDUSTRY DOES NOT TAKE SELFISH POSITION

"For the reasons heretofore assigned I do not feel in discussing this problem on behalf of coal that that industry is assuming a selfish attitude in this proceeding. To a greater extent than any other commodity coal is used, both directly and indirectly, by the people of this country. If it is not used by them directly, for the purpose of light, fuel or power, it is necessary to their daily life in the production of the food they eat and the clothes they wear. The proposition which I wish to advocate to this commission was clearly and forcefully stated by Secretary Hoover when he said:

"'If I were examining the freight rates I should at once say that coal, metals, wood and agricultural and other producer's goods should be reduced to the bottom before l.c.l. or class rates are touched. . . . An economic analysis of our industry will show that l.c.l. and class rates are far too low compared to the rates on primary commodities.'

"Certainly this declaration was not made by the Secretary of Commerce as the special representative of or spokesman for the coal industry. It is the uncontrovertible declaration of a man of high economic authority. Please note that he lays emphasis upon the fact not merely that coal rates should be reduced, but that they should be reduced 'to the bottom before l.c.l. or class rates are touched.' That this is a studied declaration is not to be doubted. It is the teaching of experience. And so I urge upon this commission, not on behalf of the coal industry but upon behalf of a suffering public : (1) That a substantial rate reduction be made; (2) that the first rates to be reduced be those applicable to the movement of coal; (3) that every coal rate in the United States be cut not by a mere 5 or 10 per cent but substantially, 'to the bottom'; (4) that these rates be cut immediately to that extent; (5) that this be done whether any other rates be reduced or not. The benefits that will follow from such action on your part will depend upon the depth of the cut and how soon it is made. A trifling reduction would be of no value and a delayed reduction would be less promptly and helpfully effective.

"It seems to be the consensus of opinion of the citizenship of this country that it is within your province and within your power by the entry of your final order herein to afford relief from industrial depression to a degree that cannot be equaled by any other one action of man or government. I believe this view is justified."

Mine Materials Cost Little Less Now Than They Did at War Peak

MATERIALS and supplies a coal mine uses have not shown any sudden drop in cost since the price aviation of 1920, according to a study of the subject made by the Illinois Coal Operators Association. Whereas these costs totaled 11c. per ton of coal mined in 1915 and 41½c. at the height of high prices, they are still exceedingly high, as the accompanying table covering some of the items of materials and supplies shows.

In presenting its figures the association calls attention to the fact that powder and blacksmithing, both of which might seem, at first thought, to be items of small consequence in the ultimate cost of coal, manage to find ways to become quite formidable among mine costs.

Although explosives are considered "tools of the trade" which every loader is supposed to provide at his own expense, in consideration of the tonnage rate paid him, the operators nowadays are compelled to pay part of their cost.

COMPARATIVE COST OF COAL MINING MATERIALS, 1913-1922

	1913	1920 War Peak	1922
Fuel, coal—screenings, per ton	$0.60	$3.50	$2.50
*Electric energy (average) at Mine Board, per kw.-hr.	.01¼	.02¼	.02¼
Mine Locomotive, 15 tons, each	2,700.00	8,400.00	7,000.00
Mine Locomotive, 8 tons (1915), each	3,160.00	6,053.00	4,902.00
Chain Breast Machine—19A, each	1,100.00	2,400.00	2,250.00
Mining Machine—Sullivan CE-7, each	1,750.00	4,000.00	3,750.00
Steel rails; per ton	25.00	70.00	35.00
Bar steel, warehouse, per cwt	1.65	4.17	2.53
Copper wire, base, per lb.	.14	.28	.16½
Copper bonds—00 fig. 8, each	.26	.47½	.38½
Powder, black 2f, per keg, 25 lbs.	1.00	2.25	1.90
Permissible explosives—nitro base, per cwt.	9.00	16.35	14.35
Permissible explosives—ammonia base, per cwt	11.75	22.75	18.10
EB caps, no. 6—8-ft., per c	3.00	7.70	6.60
Blasting caps (1917), per M	12.75	16.13	12.00
Crescent fuse (1917), per M	5.63	9.37	7.56
Lumber (pit car) white oak per M	27.50	55.00	45.00
Lumber (brattice)	22.50	36.00	27.00
Timbers—12-ft. white oak bars, each	.50	1.47	1.25
8-ft. props, each	.16	.41	.32
5x6x5½ ties, each	.20	.40	.32
Lubricants—engine oil, per gal.	.12	.36	.28
cylinder oil, per gal.	.28	.56	.47
black oil, per gal.	.06	.19	.17
Pit cars, each	$48.00	$200.00	$135.00
Pipe (2-in.), per ft.	.08	.22	.12
Supplies—shovels, per doz.	5.50	15.00	10.75
drills, each	5.50	12.00	10.00
blasting paper, per cwt.	3.50	11.00	7.25
Overhead line materials—			
Hangers, each	.18	.60	.59
Clamps, each	.15	.45	.31
Sectional switches, each	2.75	7.75	9.00
Hoisting rope (1¼-in.), per ft.	.15	.38	.30½
Track spikes (base), per cwt.	1.65	5.40	3.25
Cement (portland), per bbl. net	.88	2.77	1.82

*Electric energy purchased from local power companies has, during and since the war period, been advanced upon authority of the State Commission 75 per cent and still continues at this high level.

Hardwood Men May Form New Association

THE American Hardwood Manufacturers Association, in convention at Louisville March 7, according to a news story, contemplates disbanding the present organization and forming an institute under which statistical information can be legally gathered and distributed in conformity with the recent decision of the Supreme Court. The court held that the former method of gathering statistics was in violation of the anti-trust law because they were made available only to the seller.

Supreme Court Dismisses Howat Plea Against Kansas Industrial Court

IN a unanimous opinion, delivered by Chief Justice Taft, the U. S. Supreme Court, on Monday, March 13, dismissed the writs of error sought by Alexander Howat and other Kansas coal-mine labor leaders against the constitutionality of the Kansas Court of Industrial Relations Act. In its decision the court said the Kansas Law created an administrative board and not a court and that the state had power to create such a board, citing the creation by Congress of the Interstate Commerce Commission to regulate transportation.

The union contended that the act seeking to create the Court of Industrial Relations was arbitrary, oppressive, unreasonable and unjust discrimination, in violation of the Fourteenth Amendment; that it was a penal statute that was vague, indefinite and uncertain and an unlawful restraint on commerce; that it commingled the function of the three great departments of the government; that it contravened the Clayton Act and the Lever Act; that it empowered the Court of Industrial Relations to fix wages, hours and working conditions, take over and operate industries, and generally to install a system of state socialism, all in violation of due process.

The sections of the act which were held to be void are so intermingled with other sections, the union alleged, as to cause the whole act to fall.

Blames Operators for High Coal Prices; Urges Federal Collation of Cost Data

IN a speech in the House of Representatives on March 7 Representative Walter H. Newton, of Minnesota, attacked coal operators, both bituminous and anthracite, for maintaining high coal prices. He produced tables showing the income of coal companies from 1912 to 1919, prepared by the Federal Trade Commission and W. Jett Lauck. He advocated that authority be conferred upon a government agency to collect current information as to cost of production in the coal industry, and criticized the coal industry for instituting court suits to prevent the Federal Trade Commission from gathering such data.

SOME MINER.—*Rastus:* Hello, Sam. Working?
Sambo: Sure; ah's a miner now.
Rastus: Coal miner?
Sambo: No, man; ah's a kalso-miner.

Mine Fatalities in January Were Fewer in Number and Ratio to Output

ACCIDENTS at coal mines during January caused the loss of 146 lives, according to reports by the U. S. Bureau of Mines. During the same month in 1921 there were 197 fatalities. The decrease of 51 fatalities represents about 26 per cent. Based upon an estimated production of 43,955,000 net tons of coal in January, 1922, the fatal-accident rate was 3.32 per million tons mined, as compared with 4.13 for January, 1921, when the output of coal was 47,680,000 tons.

During the years 1913-21 the month of January has shown an average of 50,434,000 tons of coal mined and a loss of 202 lives. The average fatality rate for the nine-year period was 4.01 per million tons mined, which is considerably higher than the rate for January, 1922.

Comparing the accident record for January, 1922, with that for January a year ago, there was a reduction of 13 fatalities in West Virginia, 8 in Kentucky, 7 in the bituminous mines of Pennsylvania, 4 in Wyoming, 3 in Indiana, and 3 in Iowa. Alabama showed an increase of 5 fatalities and Ohio an increase of two. A reduction of 7 is noted in the number killed at the anthracite mines in Pennsylvania.

COAL-MINE FATALITIES DURING JANUARY, 1922, BY CAUSES AND STATES
(Compiled by Bureau of Mines and Published by *Coal Age*)

State	Underground													Shaft					Surface							Total by States	
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal	Mine cars and locomotives	Gas explosions and burning gas	Coal-dust explosions (including gas and dust combined)	Explosives	Suffocation from mine gases	Electricity	Animals	Mining machines	Mine fires (burned, suffocated, etc.)	Other causes	Total	Falling down shafts or slopes	Objects falling down shafts or slopes	Cage, skip, or bucket	Other causes	Total	Mine cars and mine locomotives	Electricity	Machinery	Boiler explosions or bursting steam pipes	Railway cars and locomotives	Other causes	Total	1922	1921
Alabama	6		1					2					9													9	4
Alaska																										0	0
Arkansas																										0	0
Colorado	1	2											3													3	4
Illinois	8		4	3		1							16													16	15
Indiana	1		2		3	1							7													7	10
Iowa																										0	3
Kansas			1										1													1	1
Kentucky	4				6					1			11													11	19
Maryland																										0	2
Michigan																										0	3
Missouri																										0	0
Montana																										0	2
New Mexico																										0	0
North Dakota																										0	0
Ohio	2		3	1		1		1					8								1				1	9	7
Oklahoma																										0	1
Pennsylvania (bituminous)	11	5	3			1						1	21										1	1	2	23	30
South Dakota																										0	0
Tennessee																										0	2
Texas																										0	1
Utah		2	1										3													3	4
Virginia																										0	2
Washington	1		1										2													2	1
West Virginia	8		6					1		1			16						1						1	17	30
Wyoming	1												1													1	5
Total (bituminous)	43	9	22	4	9	4		4		2		1	98						1		1		1	1	4	102	146
Pennsylvania (anthracite)	15	5	7	2		5						1	35	1				1	5					3	8	44	51
Total, January, 1922	58	14	29	6	9	9		4		2		2	133	1				1	6		1		1	4	12	146	
Total, January, 1921	101	8	40	4		9	1	5		3		7	178	1	1			2	7		1		4	5	17		197

In California, Idaho, Nevada, Georgia, North Carolina and Oregon there were no fatalities in 1921. These states have no coal-mine inspectors. Reports are obtained from operators at close of year.

Farrington Slow to Accept Illinois Operators' Bid to State Wage Parley; Deadlock Still Holds

By E. W. Davidson

EVENTS of the past week have not materially changed the coal-mine labor situation in the West. Frank Farrington, Illinois district president of the United Mine Workers, urged by the operators either to accept or reject at once their invitation to a wage conference, replied at the end of the week that his answer would be forthcoming after his state executive board meeting, on the 15th. This delays possible action for a separate state wage agreement, so that it now seems physically impossible for such an agreement to be made in Illinois in time to avert a general strike April 1.

It is common opinion among Chicago coal men that Farrington has no intention of meeting the Illinois operators until after a strike has been called. By that delay he would ostensibly be staying in the International union ranks. He has already used the operators' invitation to enable him to take a verbal crack at his dear enemy President Lewis of the International, and there is a feeling that he will somehow manage to use it adroitly to embarrass Mr. Lewis further. Then, after the strike has been called, he is expected to get right down to the business of winning as good a separate settlement with the Illinois operators as possible.

Early in the week Farrington lived up to expectations in the answer he wired to President Lewis' telegram which had "advised" that Illinois miners not undertake negotiations for a separate settlement. It seems that Lewis' "advice" was just what Farrington hoped for. It gave Farrington the chance for this come-back, in which he termed Lewis' "advice" as "presumptuous and impertinent":

> We regard the release of your telegram to the press as a plain attempt to put the Illinois mine workers in a false position before the mine workers of the country.
>
> We do not intend to drift into a strike merely for the purpose of allowing some of us to get our pictures in the movies, in the face of the fact that a meeting with the Illinois operators may bring about a satisfactory agreement and one that will save our membership from a demoralizing and disastrous strike.
>
> The action of the international board is presumptuous, because that body has presumed to function on a matter that comes clearly within the province of the policy committee created by our recent international convention.
>
> The trouble is that President Lewis and the International executive board have failed to differentiate between negotiations for an agreement and concluding an agreement. Under the thirty-second section of our state contract we are obliged to enter negotiations, but we are not obliged to conclude an agreement and we have not asked for authority to do so, and we have not even implied that we intend to do so.

The Illinois operators waited the rest of the week for Farrington to reply to their invitation, which had tossed this new bone of contention between Lewis and the Illinois king of coal labor. On Friday they wired to Farrington, urging an immediate reply, thus:

> Illinois operators again call your attention to the fact that they would like to secure the adjustment of a new contract with the miners if it is at all possible before the expiration of the present agreement.
>
> For almost three months now—to be exact, since Dec. 17—we have done everything possible to get negotiations under way. We have met fully and completely every contract requirement to secure conference, but continue to be absolutely denied any opportunity to discuss the subject of wages with the representatives of our employees.
>
> We do not propose to be held at fault if there is a strike or cessation of work at Illinois mines after April, nor to lend our assistance in the slightest degree to others that may contemplate the enforcement of such a policy.
>
> As a matter of fact we are not concerned with the internecine difficulties of your International union organization, which so far as Illinois is concerned has not justified itself by seeking to compel our continuing acquiescence in its present policy, after we have fairly secured the right to negotiate in our own state, having twice promptly consented to join in a four-state committee meeting to consider the possibility of arranging for a larger conference body.
>
> In previous years we have always been granted the right to elect where and how we would negotiate. No state participating in these joint conferences during the past score or more years has ever sought to compel others to join them. Participation has always been voluntary.
>
> The really serious part of getting a new scale and working agreement should not be in getting started but rather in reaching an understanding of just how we can meet the competition of coal originating at mines where they have no unions and where the operators are not confronted with difficulties such as are herein recited.
>
> Under these circumstances and in view of the now apparent certainty that the proposed four-state committee meeting which continues to be demanded will, if and when held, yield nothing in the way of securing a subsequent four-state conference, why should we not proceed with negotiations here in Illinois?
>
> Ten days ago we asked for a meeting with you and the Illinois executive board and suggested Chicago, March 8, as a place and time of meeting. This suggested date has come and gone and we have no reply from you whatever. We insist upon your immediate acceptance or rejection of our proposition.

This brought Mr. Farrington's reply that the decision would be made at the state executive board meeting, on the 15th.

The view in Chicago is that labor is still counting heavily on the government succeeding in getting miners and operators together in spite of the reported refusal of the Pennsylvania operators to attend such a conference. It is difficult to imagine such a conference would result in anything but a new statement of their cases by both sides, but the belief is that labor hopes to manipulate the conference so that something resembling the old government coal commission can be established. From such a board labor would fondly hope to get a far better wage decision than could possibly be gotten by states.

The Illinois operators, who consistently offered to meet labor in the four-state group until President Lewis, getting only "Noes" from Eastern operators, called off one proposed conference after another, now take the position that a four-state conference would be of no avail because "Mr. Lewis and his executive associates are not in position to complete a wage agreement and scale at the present time. They have no latitude in which to do so and can only present the demands adopted at the recent miners' convention. If the miners' referendum now being taken shall so authorize, there would be no other procedure for Mr. Lewis to follow, if these demands are denied by the operators, than to declare a strike by his entire membership. Of what avail," concludes the Illinois producers' statement, "is a joint four-state conference under such circumstances? And why the arbitrary denial of separate state negotiations?"

There still is no indication that Indiana is getting ready to follow Illinois. John Hessler, president of District 11 of the miners, declared the Indiana miners would not bolt the convention program. There was no suggestion of a proposal from the Indiana operators.

The miners' union tried to make it plain that the conference last week between the Kansas, Missouri and Arkansas-Oklahoma districts of the mine organization with Southwestern operators was held only to enable the miners to formally present the convention demands and that no defection in union ranks was developing there.

Pittsburgh and Ohio Operators Reiterate Their Position

Efforts of Secretary Davis to Arrange Interstate Meeting with Mine Workers Does Not Change Attitude of Producers

SECRETARY DAVIS' effort on March 9 to induce the operators of the Central Competitive Field as a group to meet the United Mine Workers brought forth replies from the operators but did not change the position of any of them. It went further, indeed, for it drew the fire of the central Pennsylvania operators, the most important of the "outlying" fields.

Pittsburgh on March 9 summed up its position in these words: "Our decision has been reached. We will deal with our own men in western Pennsylvania, union or non-union, on a working agreement, with the exception of the check-off, but we will not be a party to a scale for Ohio, Indiana and Illinois. Our position is irrevocable." In explanation of this position the Pittsburgh operators point out that in their opinion the practice of central field wage determination, used as it is for the county as a whole, is economically unsound. The miners insist upon it because it helps maintain a control of miners' wages in both the United States and Canada. The producers further state that: "The aim of the miners is to force a non-competitive coal market so that wages may be maintained at an unusually high level."

Eastern Ohio operators renewed their willingness to join a central field negotiation, providing all fields come in. Illinois has repeatedly so stated her position and, of course, Indiana would adopt the same course.

Southern Ohio, from the start, has been willing to meet the miners locally but not as a part of an interstate negotiation. The letter of W. D. McKinney, secretary of the Southern Ohio Coal Exchange, to Secretary Davis dated Columbus, March 11, states the case of operators in that field fully, as follows:

"The operators of southern Ohio cannot participate in wage conferences with operators and miners of other states, but they will meet with the representatives of the mine workers of this district at any time to discuss a wage scale and working conditions that are fair to the miners and operators of southern Ohio and that are in accord with public welfare and demands and sound policy. The economic and competitive conditions in southern Ohio are in no way identical with the other districts with which they are asked to participate and neither the miners nor operators of southern Ohio could justify any agreement that may be arrived at in such a joint interstate meeting as suggested.

"The demands of the United Mine Workers are practically the same as those which have been presented to and rejected by every interstate conference which has been held in the last three years—at Buffalo, Oct. 2, 1919; at Philadelphia, Oct. 9, 1919; at Washington, Oct. 21, 1919, in conference called by Secretary of Labor Wilson at the request of President Wilson, followed by the strike of the miners in violation of the then existing agreement. These demands were also rejected by the Bituminous Coal Commission, and on March 31, 1920, a new agreement was made, based on the finding of that commission, to cover the period of two years ending March 31, 1922. In August, 1920, four months after that agreement had been made, the United Mine Workers asked for an interstate conference, which was convened at Cleveland, Aug. 13, 1920, at which conference the miners demanded an increase of $2 per day for day work and an increase of 10c. a ton for mining, also modification of other basic provisions of the contract. After a five-day conference the miners and operators could not agree and the whole matter under consideration was referred to the various districts for their action, thereby disrupting the four-state agreement.

REJECTION OF MINERS' DEMANDS DISRUPTS AGREEMENT

"The rejection of the miners' demands by the interstate conference at Cleveland in August, 1920, now renewed, disrupted the interstate movement and at that time was so considered by the United Mine Workers themselves.

"The Ohio operators met with the Ohio miners in Columbus on Aug. 28, 1920, at which meeting the miners' representatives informed the operators that unless an increase of $1.50 per day in the day wage scale was granted the *operators* would have to assume the responsibility for the closing of the mines. This was followed by a district agreement making an advance of $1.50 per day for day workers. The same process was followed by other states. Thus the present wage scale, the continuation of which is demanded by the United Mine Workers, is, in so far as the day wage scale is concerned, based on a district agreement and not on a interstate agreement.

"The present demands have been rejected by every tribunal to which they have been presented. On the other hand, the United Mine Workers have violated every agreement made by them since April, 1916, and we cannot consistently attend any further conferences with the representatives of an organization that has so thoroughly demonstrated its inability and unwillingness to keep its four-state contracts.

"You understand, of course, that the method of arriving at wage scales by interstate agreement has been challenged in the federal courts as a violation of the Sherman Anti-Trust Law.

"In conclusion, permit us to repeat our assurance that the operators of southern Ohio will be glad to confer with the representatives of their employees at any time to discuss a wage scale and working conditions, with the understanding that it will not include the check-off."

The scale committee of the Northern West Virginia Coal Operators' Association and C. F. Keeney, president of District No. 17, United Mine Workers of America, will begin negotiations in Baltimore March 25 for a new wage scale for the northern West Virginia field. This was agreed to at a meeting in Baltimore Monday, March 13, between the committee and Mr. Keeney.

The members of the scale committee assembled in Baltimore Monday expecting to begin wage negotiations with Mr. Keeney, who, the operators said, had accepted their invitation to confer with them. Mr. Keeney told the committee that he first wanted to have the question discussed at his union convention at Charleston, W. Va., on March 21. He suggested a conference with the committee on the 25th, to which the operators agreed.

Union miners of the Pittsburgh bituminous coal field were invited on March 13, by the Pittsburgh Coal Producers' Association, to meet with it on March 20, to "negotiate a wage scale for the mines in the Pittsburgh district."

Central Pennsylvania Operators Oppose Interstate Settlement

As Chief Competitors Are Non-Union Fields, They Hold That Rates Paid There Should Be Basis of Scale

ACTING through the Central Coal Association central Pennsylvania operators on March 10 wrote Secretary Davis opposing the principle of an interstate wage settlement to which they are not party but by which they are bound. Pointing out that the central Pennsylvania field produces in excess of 10 per cent of the total soft coal output in the United States, G. Webb Shillingford, president of the association, said that these interstate conferences have in the past been the means of setting up a monopoly of union labor regardless of competitive conditions. All the great fields in the East and competitive with central Pennsylvania, he pointed out, are now non-union, and it is upon the rates in those fields, not the Central Competitive Field, that central Pennsylvania mine wages must be based.

Mr. Shillingford says:

"The present policy of the United Mine Workers of America prohibits any agreement being reached in the outlying districts until an agreement has been consummated in the Central Competitive Field. This means that the miners of central Pennsylvania will be ordered to suspend work on April 1 without having had the authority to negotiate a new wage scale.

"The Central Coal Association has repeatedly requested the officials of the United Mine Workers of America of this district to meet them and discuss a revision of wages to meet economic conditions, but in each instance this request has been refused, such refusal having been directed by the national president of the United Mine Workers of America. However, the members of the Central Coal Association still stand ready to meet the representatives of their employees, whether union or non-union, in order to negotiate a new schedule of wages and rules to take the place of the one expiring on March 31, 1922.

"We respectfully urge the administration to carefully consider in its very proper attempt to avoid a strike that it does not further complicate the situation and handicap the efforts of responsible operators who are endeavoring to get themselves in a position where they can treat with their employees in fairness and serve the public properly."

Only Temporary Advantage to Producers Seen in Local Wage Adjustments; Reserve Stocks Now a Menace

By Paul Wooton
Washington Correspondent of Coal Age

THAT operators in other parts of the Central Competitive Field are worried over the prospects of an agreement in Illinois may be judged from the communications which are reaching Washington. In their desire to avoid a national agreement some operators apparently have lost sight of some of the disadvantages which will come to them if local settlements be made. While there is no question that better bargains can be driven in local settlements, attention is called to the fact that the operators have much to lose in any break in the solidarity among operators in union territory. The fact that the operators in the Central Competitive Field have been able to act as a unit has stabilized the situation and tended toward definiteness in costs. If they surrender the idea of fixing wages in the Central Competitive Field and then adjusting other scales to agree with it, another step will be taken in the progress of the disintegration which is going on—a trend so clearly indicated when F. S. Peabody withdrew from the National Coal Association.

There are other evidences that the whole bituminous industry is engendering a Balkan-like spirit. Everyone seems to be out to get everyone else. This trend is not confined to the Central Competitive Field. Other union groups are fighting among themselves. There is an inclination toward new alliances and new groupings, such as the announcement of the trans-Mississippi states that they would deal with their own miners without waiting to see what the Central Competitive Field will do. Many think that this is showing lack of reflection. If independent agreements are made in advance, the question is being asked how they will be able to bring their costs into adjustment with the Central Competitive Field when things jolt down to normal again. There is an increasing realization that there are arguments to support John L. Lewis' position that economic problems are nation-wide.

Any Agreement in Illinois May Not Be Permanent

If the Illinois operators enter into an agreement with their miners, it is fully expected that it will not be a permanent or binding agreement. It seems apparent that state agreements will have to be temporary, so as to permit of readjustments after the action of competitors is known. There also is the freight rate reduction to be considered. When this item of cost comes down, competitive relationships will be changed again. It is pointed out that a sizable cut in freight rates at this time would have a far-reaching effect in the Central Competitive states. High freight rates have the effect of a protective tariff. They sequester most of the nearby market for the local producers. There is no doubt that the relatively favorable working time in Illinois has been a direct result of the high freight rates.

While there is a general feeling in administration circles and among coal specialists in Washington that an agreement in the anthracite fields is not at all improbable, it can be said that there is no single individual whose business it is to follow the coal situation who expects to see a strike avoided in the bituminous industry. While it was necessary to accumulate large stocks to prevent the union from winning the strike, those very stocks constitute a menace in that their owners want to use them up with the least possible loss. As a result there is many a consumer who is hoping the strike will materialize.

Most of the operators are welcoming the "showdown." The miners have little to lose and their leaders know that the strike is a necessary step before the rank and file in the union develops a psychology sufficiently plastic to consider the question rationally. In this connection, however, it can be said that if the strike is avoided, activity in the bituminous industry will drop to new low levels.

On March 9 Secretary of Labor Davis made the first official public announcement that he was seeking to persuade the operators and miners in the Central Competitive Field to confer on a new wage agreement prior to the expiration of the present contract.

The Secretary's announcement follows:

"Secretary of Labor Davis is in direct communication with representatives of the coal operators of the Central Competitive states—Indiana, Illinois, Ohio and western Pennsylvania. It is his earnest desire that both the miners and operators carry out the spirit and intent of the resolution adopted at the New York conference of March, 1920, which provided for a preliminary conference to meet prior to April 1, 1922 to arrange a time and place for a meeting to take up and consider the making of a new agreement.

"The Secretary's action is heartily approved by President Harding. None of the government officials in touch with the threatened coal situation can see any objections to a council table gathering of those directly interested in the bituminous coal industry, and particularly in the present situation, when it is a part of the last agreement and in line with long-time practice in the coal industry.

"Joint meetings such as that of the anthracite operators and miners called for New York City, March 15, give to each side an opportunity to go into every phase of the disputed factors, and can only result in better understanding. The course suggested by Secretary Davis is only an expression of the earnest conviction of the public, as is evidenced by scores of editorials in the leading newspapers of the country, that until such meeting is held in accordance with a previous understanding the two sides to the coal situation have not discharged the obligations resting upon them.

"The government has no desire to interfere unduly, but, having not only the interests of the employers and employees in mind, it also has a duty to safeguard the interests of the people, who will be seriously affected by the suspension of coal mining.

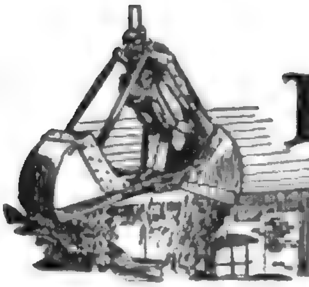
"Secretary Davis cannot see why, in the interests of common sense, the two sides to the coal controversy cannot get together, adjust their differences, and save the country from the costly results of a strike."

Not Much Importance Attached to Davis' Efforts

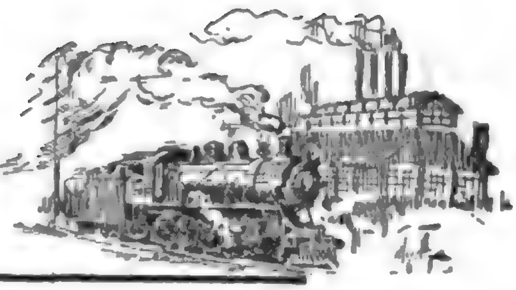
Little significance seems to be attached to the activities of the Secretary of Labor. It is recognized that he is doing just what he is expected to do under such circumstances, but the situation is such that nothing definite may be expected from a national conference at this time. It is widely believed, however, that Mr. Lewis will leave no stone unturned to influence intervention on the part of the administration.

A mild intimation was given in official circles in Washington Saturday, March 11, that the government might invoke a court mandamus to compel the bituminous coal operators to confer on the wage agreement in advance of its expiration, March 31. It was said that, the 1920 wage agreement having been negotiated by a Presidential commission, it was regarded in the light of a government document subject to enforcement in the courts. While it was felt that the operators and miners in the various fields might get together it was intimated that if they should fail within a reasonable time before March 31, the government through a mandamus in a federal court might compel the operators to meet with the unions.

Union mine leaders have given out word to the effect that the miners as a body will not strike but will suspend work, so as to avoid the possibility of the government seeking an injunction against them, which procedure was taken in the 1919 strike.



Production and the Market



Weekly Review

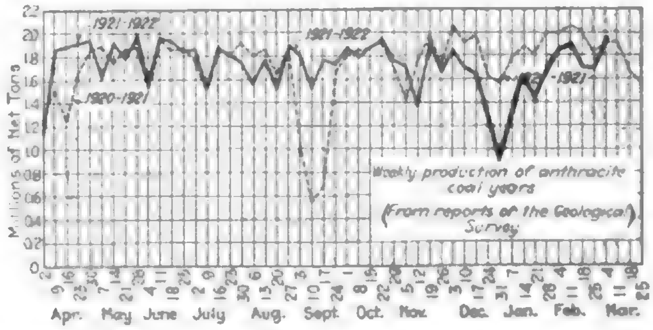
As THE date set for the suspension of mining approaches it is apparent that heavy reserves have been accumulated by railroads and the larger buyers. The volume of non-union offerings is increasing, consequently little uneasiness is being shown by the rank and file of steam consumers. Some open-shop mines are offering to make contracts on the basis of present price levels. The buyer shows very little interest in this, as so many considerations will enter into the matter this spring, but the availability of non-union tonnage is reassuring evidence to him that coal can be obtained when needed.

Interest in Market Active; Buyers Cautious

An active interest in the market is, of course, still being shown by coal users, but buying is proceeding so cautiously that the strike possibility has lost much of its influence as a market factor. Those who desired reserves as a protection have succeeded in putting aside what coal they want. This precludes any strength to spot prices and where quotations have been boosted the order generally falls through, for there is plenty of coal to be had and competition is too keen to sustain any upward price trend. *Coal Age* Index of current prices stands at 178 on March 13, as compared with 179 on March 6.

The saturation point is fast being approached, on the basis of present industrial requirements. Real encouragement is felt, however, in the slow but steady improvement in consumptive needs. Iron, steel and allied trades form the backbone of our industrial structure and their larger operations give promise of heavier coal orders. The recent strength in agricultural markets indicates better purchasing power on the part of farmers and presages more stocking activity in domestic coal this summer.

Anthracite producers are running on a close margin of domestic orders. The household consumers' stocking program does not extend beyond actual needs for the balance of the season because of the hope of lower delivered costs on next winter's coal. Only a few retailers are preparing for heavy yard supplies, the majority now seeking to cover needs to May 1 only. Steam coals are not so active, as consumers' bins have been well filled lately. There are heavy stocks of buckwheat No. 1 at the mines.



Weekly production of anthracite coal years

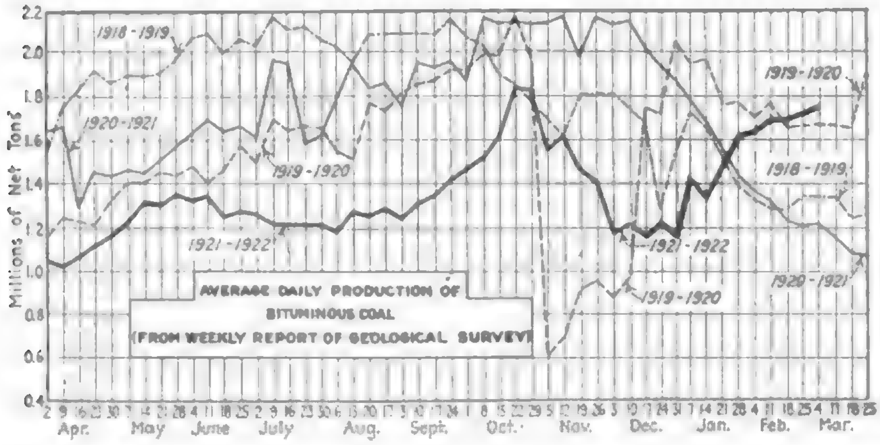
(From reports of the Geological Survey)

The spot coke market has easily held its own. Production is still curtailed, although demand has improved. In the Connellsville region inquiries on second-quarter contracts have appeared and quotations on this business are stronger.

BITUMINOUS

The upward trend of production continued during the week ended March 4. The output reached 10,536,000 net tons, 162,000 tons in excess of the figure for the preceding week, but still some 2,600,000 tons short of the peak reached just before the mine strike of 1919 and 500,000 tons less than last October, when a railroad strike threatened to tie up transportation. Loading records for the early part of last week indicated a further increase in production.

The output has gained steadily since the first of the year. With the exception of the boom years 1916-1918, February production of 40,951,000 tons was greater than in any year before or since. This favorable showing is,



AVERAGE DAILY PRODUCTION OF BITUMINOUS COAL

(FROM WEEKLY REPORT OF GEOLOGICAL SURVEY)

Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1921-1922	1920-1921
Feb. 18 (*b*)	10,285,000	7,489,000
Feb. 25 (*b*)	10,374,000	7,432,000
March 4 (*a*)	10,536,000	7,278,000
Daily average	1,756,000	1,213,000
Coal year	391,945,000	496,639,000
Daily av. coal yr.	1,382,000	1,745,000
ANTHRACITE		
Feb. 25	1,701,000	1,816,000
March 4 (*a*)	1,913,000	1,902,000
Coal year	79,587,000	83,676,000
COKE		
	1922	1921
Feb. 25 (*b*)	146,000	193,000
March 4 (*a*)	144,000	178,000
Calendar year	1,131,000	2,095,000

(*a*) Subject to revision. (*b*) Revised from last report.

of course, due principally to strike safeguards taken by consumers. It is estimated that another 10,000,000 tons of coal would be required to raise stock piles to the level reached at the close of the war.

February Tidewater dumpings increased 300,000 tons, as compared with the January figure. New England accounted for nearly one-half of the increase, although bunkers and exports also gained.

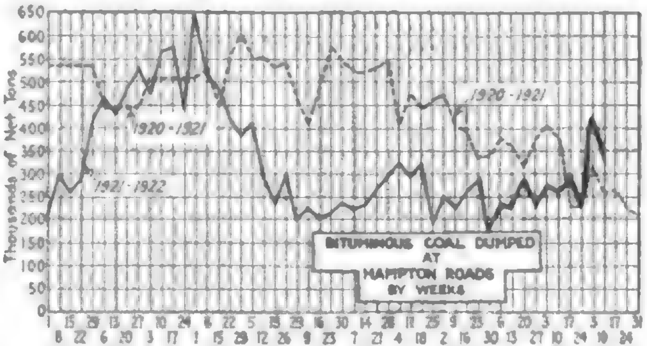
TIDEWATER BITUMINOUS COAL SHIPMENTS FOR THE MONTH OF FEBRUARY, 1922

(In thousands of net tons)

Destination	New York	Philadelphia	Baltimore	Hampton Roads	Charleston	Total Feb.	Total Jan.
Coastwise to New England	89	21	67	840	...	1,017	879
Exports	...	27	12	138	14	191	141
Bunker	251	31	31	176	3	492	456
Inside capes	....	180	94	18	..	292	270
Other tonnage	574	1	3	55	..	633	579
Feb. Total	914	260	207	1,227	17	2,625	......
Jan. Total	798	246	217	1,049	15	.....	2,325

Hampton Roads dumpings were 346,553 net tons during the week ended March 9, as compared with 416,363 tons in the previous week. The coastwise movement to New England has been heavy, as shippers are pushing their coal in that section. New England markets, however, are nearly saturated, as shown by the increasing difficulty found in making sales, despite the fact that prices have been lowered. Coastwise freights show a softening tendency, as bottoms are in oversupply.

All-rail shipments to New England declined to 3,868 cars during the week ended March 4, from 4,151 in the preceding week. The Southern coals dominate at all competitive points in this territory and central Pennsylvania producers must provide for lower costs to regain their footing in these markets.



Chicago and Middle Western markets are draggy and the stocking program has about spent its force. In the

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Feb. 13 1922	Feb. 27 1922	Mar. 6 1922	Mar. 13, 1922†
Pocahontas lump	Columbus	$3.35	$3.25	$3.20	$3.00@$3.35
Pocahontas mine run	Columbus	1.90	2.15	1.85	1.75@ 2.00
Pocahontas screenings	Columbus	1.40	1.40	1.35	1.35@ 1.60
Pocahontas lump	Chicago	3.15	3.15	3.15	3.00@ 3.25
Pocahontas mine run	Chicago	2.25	2.15	2.00	1.75@ 2.00
Pocahontas lump	Cincinnati	3.15	3.15	3.15	3.00@ 3.25
Pocahontas mine run	Cincinnati	1.85	1.75	1.75	1.75
Pocahontas screenings	Cincinnati	1.15	1.15	1.15	1.00@ 1.25
*Smokeless mine run	Boston	4.80	4.60	4.65	4.50@ 4.70
Clearfield mine run	Boston	1.95	1.95	1.95	1.65@ 2.25
Cambria mine run	Boston	2.45	2.45	2.45	2.25@ 2.60
Somerset mine run	Boston	1.90	1.90	1.90	1.75@ 2.00
Pool 1 (Navy Standard)	New York	3.00	3.00	3.00	2.75@ 3.15
Pool 1 (Navy Standard)	Philadelphia	3.05	3.05	3.05	2.85@ 3.25
Pool 1 (Navy Standard)	Baltimore	2.60	2.70	2.70	2.65
Pool 9 (Super. Low Vol.)	New York	2.45	2.40	2.50	2.20@ 2.65
Pool 9 (Super. Low Vol.)	Philadelphia	2.45	2.45	2.45	2.20@ 2.65
Pool 9 (Super. Low Vol.)	Baltimore	2.30	2.40	2.30	2.00@ 2.30
Pool 10 (H. Gr. Low Vol.)	New York	2.10	2.00	2.10	1.90@ 2.15
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.10	2.10	2.10	1.95@ 2.20
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.05	2.10	2.15	2.10@ 2.15
Pool 11 (Low Vol.)	New York	1.75	1.75	1.75	1.60@ 1.85
Pool 11 (Low Vol.)	Philadelphia	1.75	1.75	1.75	1.65@ 1.85
Pool 11 (Low Vol.)	Baltimore	1.75	1.85	1.95	2.00@ 2.05
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.50	1.50	1.60	1.50@ 1.65
Pool 54-64 (Gas and St.)	Philadelphia	1.50	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)	Baltimore	1.40	1.40	1.55	1.50@ 1.80
Pittsburgh sc'd. Gas	Pittsburgh	2.65	2.65	2.70	2.60@ 2.75
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	2.10@ 2.20
Pittsburgh slack (Gas)	Pittsburgh	1.65	1.65	1.65	1.60@ 1.70
Kanawha lump	Columbus	2.65	2.55	2.50	2.25@ 2.75
Kanawha mine run	Columbus	1.65	1.60	1.60	1.50@ 1.75
Kanawha screenings	Columbus	1.35	1.40	1.30	1.30@ 1.45
W. Va. Splint lump	Cincinnati	2.65	2.25	2.25	2.25@ 2.75
W. Va. Gas lump	Cincinnati	2.00	1.85	2.00	2.00@ 2.25
W. Va. mine run	Cincinnati	1.60	1.40	1.35	1.35@ 1.40
W. Va. screenings	Cincinnati	1.30	1.30	1.30	1.25@ 1.35
Hocking lump	Columbus	2.75	2.55	2.65	2.50@ 2.70
Hocking mine run	Columbus	1.90	1.90	1.90	1.75@ 2.00

	Market Quoted	Feb. 13 1922	Feb. 27 1922	Mar. 6 1922	Mar. 13 1922†
Hocking screenings	Columbus	1.35	1.50	1.45	$1.60@$1.80
Pitts. No. 8 lump	Cleveland	3.10	3.10	3.10	3.00@ 3.10
Pitts. No. 8 mine run	Cleveland	1.95	2.00	2.00	1.85@ 1.90
Pitts. No. 8 screenings	Cleveland	1.65	1.80	1.80	1.75@ 1.80
Midwest					
Franklin, Ill. lump	Chicago	3.65	3.25	3.25	3.25@ 3.50
Franklin, Ill. mine run	Chicago	2.50	2.50	2.50	2.25@ 2.75
Franklin, Ill. screenings	Chicago	1.95	2.00	2.00	1.75@ 2.00
Central, Ill. lump	Chicago	3.00	3.00	3.00	2.65@ 3.00
Central, Ill. mine run	Chicago	2.35	2.35	2.35	2.25@ 2.50
Central, Ill. screenings	Chicago	1.75	1.80	1.75	1.65@ 1.85
Ind. 4th Vein lump	Chicago	3.25	3.25	3.25	3.00@ 3.50
Ind. 4th Vein mine run	Chicago	2.50	2.50	2.50	2.35@ 2.60
Ind. 4th Vein screenings	Chicago	1.90	2.00	2.15	2.00@ 2.25
Ind. 5th Vein lump	Chicago	2.80	2.90	2.80	2.65@ 3.00
Ind. 5th Vein mine run	Chicago	2.25	2.25	2.35	2.15@ 2.50
Ind. 5th Vein screenings	Chicago	1.65	1.75	1.65	1.50@ 1.75
Standard lump	St. Louis	2.90	2.60	2.60	2.50@ 2.75
Standard mine run	St. Louis	1.90	1.95	1.95	1.75@ 1.85
Standard screenings	St. Louis	1.05	1.10	1.10	1.10@ 1.25
West. Ky. lump	Louisville	2.55	2.65	2.45	2.35@ 2.60
West. Ky. mine run	Louisville	1.85	1.85	1.85	1.70@ 2.00
West Ky. screenings	Louisville	1.25	1.80	1.80	1.60@ 1.85
South and Southwest					
Big Seam lump	Birmingham	2.90	2.60	2.60	2.50@ 2.75
Big Seam mine run	Birmingham	1.85	1.85	1.85	1.70@ 2.00
Big Seam (washed)	Birmingham	2.10	1.85	1.85	1.75@ 2.00
S. E. Ky. lump	Louisville	2.75	2.55	2.45	2.25@ 2.50
S. E. Ky. mine run	Louisville	1.65	1.55	1.55	1.40@ 1.65
S. E. Ky. screenings	Louisville	1.15	1.35	1.30	1.25@ 1.40
S. E. Ky. lump	Cincinnati	2.65	2.35	2.25	2.25@ 2.75
S. E. Ky. mine run	Cincinnati	1.65	1.75	1.40	1.30@ 1.50
S. E. Ky. screenings	Cincinnati	1.05	1.15	1.20	1.25@ 1.35
Kansas lump	Kansas City	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

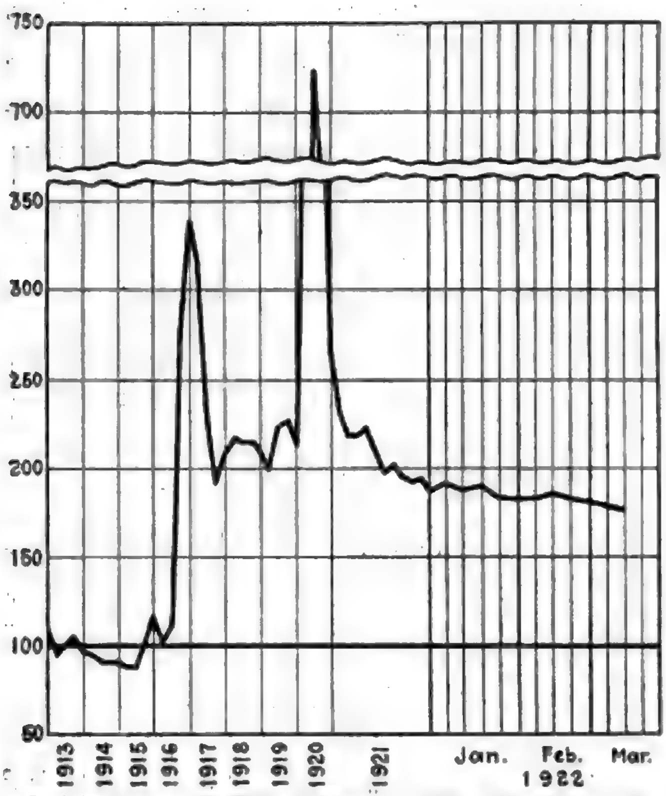
*Gross tons, f.o.b. vessel, Hampton Roads.

†Advances over previous week shown in heavy type, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	Feb. 27, 1922		March 6, 1922		March 13, 1922†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.00@$7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.85
Egg	New York	2.61	7.25@ 7.75	7.60@ 7.75	7.25@ 7.50	7.60@ 7.75	7.25@ 7.75	7.60@ 7.75
Egg	Philadelphia	2.66	7.15@ 7.75	7.75	7.15@ 7.75	7.75	7.15@ 7.75	7.75
Egg	Chicago	5.63	7.50*	7.40*	7.50*	6.95@ 7.40*	7.50*	6.95@ 7.40*
Stove	New York	2.61	7.75@ 8.10	7.90@ 8.10	7.75@ 8.10	7.90@ 8.10	7.80@ 8.10	7.90@ 8.10
Stove	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25
Stove	Chicago	5.63	7.75*	7.60*	7.75*	7.20@ 7.60*	7.75*	7.20@ 7.60*
Chestnut	New York	2.61	7.85@ 8.10	7.90@ 8.10	7.85@ 8.10	7.90@ 8.10	7.90@ 8.10	7.90@ 8.10
Chestnut	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25
Chestnut	Chicago	5.63	7.75*	7.60*	7.75*	7.20@ 7.60*	7.75*	7.20@ 7.60*
Pea	New York	2.47	5.00@ 5.25	5.75@ 6.45	4.50@ 5.50	5.75@ 6.45	4.50@ 5.50	5.75@ 6.45
Pea	Philadelphia	2.38	4.75@ 5.00	6.15@ 6.25	4.75@ 5.00	6.15@ 6.25	4.75@ 5.00	6.15@ 6.25
Pea	Chicago	5.63	6.10*	6.10*	6.00*	5.60@ 6.10*	6.00*	5.60@ 6.10*
Buckwheat No. 1	New York	2.47	3.00@ 3.50	3.50	3.00@ 3.50	3.50	3.00@ 3.50	3.50
Buckwheat No. 1	Philadelphia	2.38	2.75@ 3.50	3.50	2.75@ 3.50	3.50	2.75@ 3.25	3.50
Rice	New York	2.47	2.00@ 2.50	2.50	2.00@ 2.60	2.50	2.00@ 2.60	2.50
Rice	Philadelphia	2.38	2.00@ 2.50	2.50	2.00@ 2.50	2.50	2.00@ 2.50	2.50
Barley	New York	2.47	1.50@ 1.75	1.50	1.40@ 1.60	1.50	1.50@ 1.75	1.50
Barley	Philadelphia	2.38	1.50@ 1.75	1.50	1.50@ 1.75	1.50	1.50@ 1.75	1.50
Birdseye	New York	2.47	1.60@ 1.90	2.00@ 2.50	1.65@ 1.75	2.00@ 2.50	1.65@ 1.75	2.00@ 2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type, declines in *italics*.



Coal Age Index 178, Week of March 13, 1922. Average spot price for same period, $2.16. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

Northwest a belated buying movement has started, as some consumers fear that a prolonged tie-up would deplete dock stocks. Eastern Inland and Cincinnati Gateway points show less buying activity. Stocks have increased materially of late and the heavy volume of non-union receipts is reassuring those who are not in position to further safeguard their fuel supplies. Throughout the country the most active buyers at present are the railroads and public utilities.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report

Non-Union	Six Months July to Dec. 1921	Jan. 1, to Feb. 25, 1922, Inclusive	Week Ended Feb. 25
Alabama	63.5	60.5	62.0
Somerset	55.5	74.0	83.7
Panhandle, W. Va.	55.3	46.7	52.2
Westmoreland	54.9	56.6	65.4
Virginia	54.8	55.8	70.7
Harlan	53.3	54.5	57.8
Hazard	51.7	61.3	62.7
Pocahontas	49.8	58.7	67.2
Tug River	48.1	60.5	73.8
Logan	47.6	58.5	68.3
Cumberland-Piedmont	46.6	48.1	53.3
Winding Gulf	45.7	61.2	6.3
Kenova-Thacker	38.2	51.1	61.6
N. E Kentucky	32.9	42.8	49.5
New River**	24.3	29.0	36.9
Union			
Oklahoma	63.9	58.7	60.7
Iowa	57.4	75.6	81.2
Ohio, eastern	52.6	44.4	48.4
Missouri	50.7	61.8	61.0
Illinois	44.8	51.3	56.1
Kansas	42.0	49.2	56.4
Indiana	41.4	51.0	65.1
Pittsburgh †	41.2	36.7	41.0
Central Pennsylvania	39.1	47.6	55.5
Fairmont	35.3	48.5	36.9
Western Kentucky	32.5	34.3	38.1
Pittsburgh *	30.4	27.7	31.1
Kanawha	26.0	13.8	19.8
Ohio, southern	22.9	23.9	27.8

*Rail and river mines combined.
†Rail mines.
**Union in 1921, non-union in 1922.

ANTHRACITE

Production of hard coal rose to 1,913,000 net tons during the week ended March 4, according to the Geological Survey. This was 212,000 tons in excess of the preceding week's output and slightly larger than the corresponding week of 1921. Only a few dealers are protecting their supplies further than May 1. Domestic consumers are buying just enough to last through the season and small orders constitute the bulk of the retail business. Steam coals are less active and it is evident that the recent heavy movement has nearly filled consumers' bins. Buckwheat No. 1 is fast approaching a sluggish position.

COKE

Beehive coke production was 144,000 net tons during the week ended March 4, only 2,000 tons less than in the previous week. Production in the Connellsville section has risen, while the demand is somewhat stronger. Spot prices have held firm and inquiries for second-quarter contracts have appeared. A moderate sized second-quarter contract for furnace coke was closed last week at $3.50.

Foreign Market And Export News

Export Clearances, Week Ended March 9, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Nor. S.S. Godosund, for Curacao	1,716
For Brazil:	
Ital. S.S. Armando, for Buenos Aires	6,336
Br. S.S. Tapajoz, for Para	4,998
For Chile:	
Am. S.S. Orcus, for Valparaiso	4,618
For Cuba:	
Br. S.S. Berwindvale, for Havana	5,287
Am. S.S. Moldergaard, for San Juan	215

FROM PHILADELPHIA:

For Nova Scotia, N. F.:	
Br. Schr. Vincent A. White, for Halifax	....

Coal Paragraphs from Foreign Lands

FRANCE — Production for the year 1921 is estimated at 28,240,887 metric tons. Mine consumption was over 4,000,000 tons; 961,000 tons were delivered to coke ovens, and 2,273,000 tons converted into briquets. Production of lignite was 735,000 tons.

GERMANY — Production in the Ruhr region during the week ended Feb. 25 was 1,978,000 metric tons, according to a cable to *Coal Age*. The preceding week's output was 1,950,000 tons.

ITALY — Cardiff steam first is now quoted at 42s. 9d. on the Genoa market, according to a cable to *Coal Age*, an increase of 9d. in the past week.

SPAIN—The market in general is quiet. In the Leon and Palencia districts there is a lack of business, except in anthracite.

After a series of tentative measures Spain has at last established the new customs tariff. In glancing through the new tariff one is struck, among other things, by the sub-division of the items dealing with mineral combustibles. Formerly the items were: coal, coke and briquets; now they are sub-divided into anthracite, coal, other mineral combustibles, coke, briquets and retort carbon. Coal and anthracite pay 22.50 and 7.50 pesetas per ton; coke and briquets 27 and 9 pesetas and retort carbon 60 and 20. There is a bounty of 5 pesetas per ton on Spanish coal, equivalent to a similar increase in the tariff so far as imports are concerned.

BELGIUM—The coal market is pursuing the tendency toward a decline in prices. Milder weather has slowed down domestic sales and transactions in industrials lack importance on account of the growing imports of English coal.

Hampton Roads Pier Situation

	Week Ended March 2	Week Ended March 9
N. & W. Piers, Lamberts Point:		
Cars on hand	2,156	2,533
Tons on hand	126,651	134,436
Tons dumped	160,268	132,795
Tonnage waiting	12,000	6,750
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,585	1,424
Tons on hand	79,250	71,200
Tons dumped	128,043	125,909
Tonnage waiting	28,200	2,500
C. & O. Piers, Newport News:		
Cars on hand	1,273	1,373
Tons on hand	62,730	58,750
Tons dumped	83,442	60,719
Tonnage waiting	445	......

British Output Highest Since Last December; Price Cuts Made on Prompt Business

BRITISH production during the week ended Feb. 25 reached the highest point since last December, according to a cable to *Coal Age*. The output reached 5,047,000 gross, as compared with 5,001,000 tons in the previous week. The export demand, while still active, has lost some of its insistence and concessions are being made to secure prompt business.

Increased prosperity is reported from the majority of coal centers, especially Northumberland and Durham. Prices have been steady, especially in steam and gas coals. The Bergen gasworks has ordered 20,000 tons of mixed Durham coals for delivery from April until August. Coking coal markets are also looking up.

As far as the Scottish markets are concerned, the ice-bound condition of the Baltic and Northern European ports has had a serious effect on shipments. The loss has fallen chiefly on the Forth and Fife ports. On the other hand. Continental buyers are indicating a tendency to negotiate forward engagements; and Scandinavia, France and Italy are showing an increasing interest in Scottish coals. The inactivity of the Scottish industries is holding back the Inland trade.

There is more trouble in Wales. Men at some of the collieries in the neighborhood of Newport complain that whereas they are entitled to a minimum weekly wage of £2 14s. they have only been receiving sums varying from 15s. to 20s. As a result, men stormed the offices of some of the executives, there was some violence, and the officials were compelled to undertake that the minimum wages would be paid immediately.

The third section of the report of the Inspector of Mines for 1920, now published, gives a general review of the conditions prevailing in the British mining industry during the years 1913 to 1920.

The number of employees at mines and quarries increased from 1,236,211 in 1913 to 1,337,297 in 1920, or by 8 per cent. The selling value in 1920 of coal was greater by 241 per cent than the figure for 1913.

The total coal raised in 1920 was 229,532,081 gross tons. Except for 1918 this was the lowest recorded since 1903, and 25 per cent lower than the figure for 1913.

The amount of coal available for home consumption in 1920, neglecting the stocks held at the beginning and at the end of the year, was 185,800,000 tons. Owing chiefly to the curtailment of shipments abroad, this quantity was only 3,300,000 tons less than in 1913.

January Exports Are Insignificant

Exports of bituminous coal from the United States were 643,913 gross tons, as compared with 770,092 tons in December and 2,248,448 in January, 1921. Only about 100,000 tons went to destinations other than Canada and Mexico, showing to what extent our oversea exports have dropped. Imports of bituminous coal increased to 111,037 gross tons from the December tonnage of 87,506.

JANUARY EXPORTS AND IMPORTS
(Gross Tons)

	Jan. 1921	Jan. 1922
Exports, bituminous coal:		
By rail to		
Canada	1,177,874	526,016
Mexico	32,176	7,177
Total	1,210,050	533,193
By vessel to		
West Indies	34,065	12,623
Panama	51,452	9,625
Cuba	55,003	41,240
Total	140,520	63,488
Argentine	107,135	14,566
Brazil	35,651	12,365
Chile	66,277	680
Uruguay	11,065	......
Total South America	220,128	27,611
France	143,448	......
Italy	185,907	8,206
Netherlands	76,538	......
Sweden	17,707	......
Denmark	30,165	......
Norway	29,246	......
Total Europe	483,011	8,206
Egypt	78,637	7,199
Other Countries	116,102	4,216
Total bituminous	2,248,448	643,913
Total anthracite	289,340	224,040
Total coke	36,745	30,372
Imports, Bituminous Coal:		
Imported from:		
United Kingdom	1,500	17,025
Canada	64,834	82,263
Japan	......	2,075
Australia	......	9,674
Other countries	525	....
Total	66,859	111,037

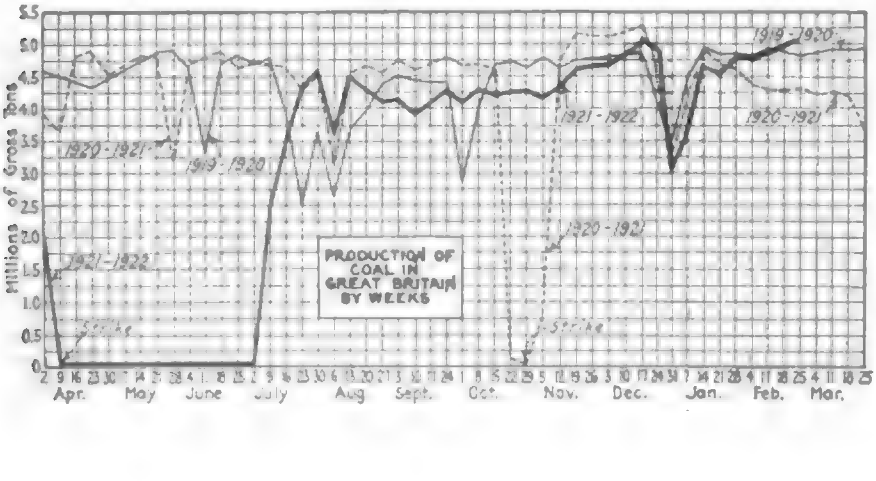
Hampton Roads Shippers Cultivating South American Markets

Coal dumpings fell off slightly last week, although the market was still brisk, with a tone of optimism over all. The Virginian Piers lead in dumpings for the first time in many months, and all piers show prospects of breaking the high record made in February.

While the demand was active, prices were weak, the best bunker coal being available in unlimited quantities for $4.75, and other grades ranging down as far as $4.25. Continued activity in the mines serving this territory was seen.

Coastwise trade leads, with demand for bunkers strong and with export movements holding their own. Coal to the West Indies is still in demand, with prospects for movement of larger quantities to South America soon.

Agitation on the part of certain Northern ports for uniformity in freight rates, to affect bunker coal, was received with much concern by Hampton Roads shippers. They are preparing to fight any such adjustment which would be calculated to deprive this port of its geographical advantages.



French Coal Imports in December, 1921

	Tons
Coal from	
England	1,177,215
Belgium	179,321
United States	6,258
Germany	439,614
Sarre	1,354,489
Other countries	29,093
Total	3,185,990
Coke from	
Belgium	12,092
England	11
Germany	220,661
Other countries	51,776
Total	284,540
Briquets from	
England	19,871
Belgium	63,315
Germany	61,226
Other countries	26,501
Total	170,913
Total, all fuels	3,641,443
Total, November	3,914,006

Pier and Bunker Prices, Gross Tons

PIERS

	March 4	March 11†
Pool 9, New York	$5.40@$5.60	**$5.50@$5.75**
Pool 10, New York	5.10@ 5.20	**5.20@ 5.40**
Pool 9, Philadelphia	5.50@ 5.85	5.50@ 5.[illegible]
Pool 10, Philadelphia	5.20@ 5.60	5.20@ 5.60
Pool 71, Philadelphia	5.70@ 6.00	5.70@ 6.00
Pool 1, Hamp. Rds.	4.60	4.60
Pools 5-6-7 Hamp. Rds.	4.25	*4.15@4.25*
Pool 2, Hamp. Rds.	4.45	4.45

BUNKERS

	March 4	March 11†
Pool 9, New York	$5.70@$5.90	**$5.80@$6.15**
Pool 10, New York	5.40@ 5.50	**5.50@ 5.70**
Pool 9, Philadelphia	5.90@ 6.10	5.90@ 6.10
Pool 10, Philadelphia	5.60@ 5.85	5.60@ 5.85
Pool 1, Hamp. Rds.	4.75	4.75
Pool 2, Hamp. Rds.	4.55	4.55
Welsh, Gibraltar	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	39s. t.i.b.	39s. t.i.b.
Welsh, Messina	36s. t.i.b.	36s. t.i.b.
Welsh, Algiers	34s. f.o.b.	34s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	40s. f.a.s.	40s. f.a.s.
Welsh, Teneriffe	40s. f.a.s.	40s. f.a.s.
Welsh, Malta	40s. f.o.b.	40s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Welsh, Naples	39s. f.o.b.	39s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Belgian, Antwerp	30s.	30s.
Alexandria	47s.	*45s.*
Bombay	38 rupees	38 rupees
Capetown	42s.	*39s.*

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	March 4	March 11†
Admiralty, Large	27s.@27s. 6d.	27s.@27s. 6d
Steam, Smalls	19s. 6d.@20s.	19s. 6d.@20s.
Newcastle:		
Best Steams	25s.	25s.
Best Gas	23s.@24s.	**24s.**
Best Bunkers	23s. 6d @24s.	*23s.@23s.*

†Advances over previous week, shown in **heavy type**; declines in *italics*.

North Atlantic

Spot Market Weakens As Stock Piles Grow

With Stocks Good and Heavy Non-Union Offerings, Market Lacks Snap—Railroad Buying Is Market Feature—Not Much Contract Interest Shown Before Strike.

Little nervousness is being shown over a shortage resulting from a strike. There is so much non-union tonnage available and stocks are so good at the present rate of consumption that there is no snap to the market. Railroad buying is the best market feature at this time.

Prices show a softening tendency, although receipts at the larger centers are being cut to lower levels than have prevailed recently. Non-union coals are being freely offered on every hand and in some instances producers are seeking contracts, using the present market as a price basis. Not much contract interest is being shown, however, buyers preferring to await the new conditions after the strike settlement.

NEW YORK

Large consumers have some coal in reserve, and, with the non-union mines producing after April 1, there is a strong feeling that the strike discomfort will be slight. Railroads and public service corporations are well supplied.

There were about 1,700 cars of coal at the local docks on March 10, a lower number than for many days and a decrease of about 500 cars over the corresponding day of the previous week. Contracting is hardly discussed. Both coal man and consumer are awaiting the outcome of the wage negotiations before deciding upon the course to be taken.

Local dealers will watch with interest today the prices submitted at the opening of bids for coal for ten city departments, the contracts to run for three months.

PHILADELPHIA

Buyers still remain indifferent to the possibilities of a strike. The larger consumer has in many instances fortified himself with a surplus of from 30 to 90 days, and the other class of consumers feels certain that there will be enough coal mined to prevent any distress. There probably has not been a time since the present depression started that so much non-union coal has been offered here.

The iron industry continues stagnant. It would seem that the independent plants in this territory did not recover from the depression with the same degree as the corporation plants in the other sections of the country.

The consumer is also growing somewhat dubious now of an early reduction in freight rates. Those cheerful spirits who have looked for a cut by April 1 are now pointing to July 1 as the objective point, but even this seems to be doubtful.

FAIRMONT

Taking northern West Virginia as a whole the market is soft. Buyers seem indifferent as to whether they are able to secure supplies or not before April 1. Although railroads are securing the bulk of the tonnage produced, comparatively few are taking on more fuel. A few carriers, however, are placing contracts.

BALTIMORE

Local demand has lightened rather than increased in the face of the near approach of the strike period. Prices have likewise slipped so that at times Pool 9 is offering as low as $2.15 a net ton f.o.b. mines, although the average range is some 15c. or so higher. Excellent gas coals are on the market around $2.35 per net ton mine basis.

The export movement from Baltimore continues exceptionally poor, not a single ship having cleared from the port from Feb. 10 to the end of the month, and the total movement of 12,584 tons being a low record for the port in coal cargo movement.

CENTRAL PENNSYLVANIA

Under instructions from the national organization, the miners of this district took a referendum on the question of a suspension on April 1. As this vote will not be counted until after March 15, the result will not be known much in advance of the day set to suspend.

In view of the policy adopted at the Indianapolis convention, operators cannot see that any practical results will follow a joint conference. It is contended that the miners will file their demand, based upon the action at the convention, plus such demands as may be made in District No. 2, while the operators could only file a counter proposition, based upon a comparison of conditions here and in the non-union fields.

Production is steadily increasing. During February, the field produced 3,864,709 tons, as compared with 3,373,734 tons in January.

UPPER POTOMAC

Conditions remain virtually unchanged. It is impossible to produce much coal, owing to the competition of non-union fields. A few plants are being added to the list of those which have scaled down wages to a point where production is possible. Pools 10 and 11 seem to be a little stiffer.

New England

Market Quiet; Shave Price At Times to Make Sales

Shippers Exert Every Resource—Unsold Cargoes Numerous — Textile Strike Closes Important Outlet to Large Purchases—Drop in Marine Freights Presaged.

New England markets are very quiet. Shippers are constantly exerting pressure to move coal and prices are shaved if necessary to make the sale. Unsold cargoes are numerous. Steam supplies are so heavy that only spasmodic purchases are possible until industrial conditions show some improvement. The textile strike has closed the avenue for a large tonnage.

Some contracts are being closed, but usually only with old connections, with a wage clause inserted, and the contract market, as a whole, is dormant. A surplus of coastwise vessels presages a drop in marine freights.

The current market is almost like mid-summer. Buyers have it so firmly in mind that the non-union districts will easily supply what the market is likely to require that they show no interest in present quotations.

There are cargoes waiting to discharge at Boston and Providence, the bulk of them unsold, and unless the factors handling them have more success the next few days we shall probably hear of very low prices to move distress coal.

Now that the demand here has slackened the outlet for smokeless coals at Hampton Roads is becoming narrow and restricted. A fair tonnage of prepared coal is moving West in view of the differential in its favor as compared with anthracite and in view also of the probable suspension of anthracite mining on April 1.

There is little to report with respect to contracts for next season. A few pieces of business have been closed in accustomed channels, but in such cases it is understood there is a provision for a sliding scale price which is to be fixed from month to month, being contingent on wages, railroad tolls, and other uncertain items.

Freights coastwise from Hampton Roads are expected to moderate still further. While no lower rates can be reported this week, due largely to the fact that few charters have been made, there is reason to predict $1 flat as a possible rate in the near future.

There is so little area accessible now for shipments all-rail from central Pennsylvania that few quotations are heard. For reasons of policy some Pennsylvania operators have made a still further cut in prices, hoping thereby to show the mine workers that the present wage scale is what prevents them from marketing coal on any commercial basis.

Anthracite

Retail Stocking Stimulates Production of Anthracite

Present Costs Preclude Covering Beyond May 1, as Domestic Consumers Are Indifferent to Strike—Demand for Steam Coals Wanes.

Production of anthracite has been stimulated by a belated retail stocking movement. Comparatively few retailers, however, are seeking to cover for a longer period than May 1, as no one wants much of a carryover tonnage, based on present costs. Domestic consumers are buying sparingly and display little interest in the coming strike. It is apparent that the minimum of requirements is all that will move into the householder's bin during the balance of this season.

Steam coals are not in such heavy demand, as storage customers have been well supplied in the last few weeks. Buckwheat No. 1 is the slowest and there are large supplies at the mines.

NEW YORK

Consumers are not taking the advice of tradesmen to fill their bins, or at least to put in enough coal to last them until May 1. The reverse is taking place in New England, according to reports coming to local houses.

The tendency among the largest retail dealers and those having yard space is to lay in sufficient coal to meet their requirements until May 1.

Egg coal, which has been comparatively easy, is slowly gaining strength. Pea remains stagnant, and while quotations are firm, it was said that buyers have been able in some instances to shade the quoted figures.

The market for steam coals is easier. Buckwheat No. 1 is slowing down. Rice coal is in better demand than buckwheat, and the upper-region coals are able to command slight premiums. Barley is still the strongest of the list.

Washery coals are being offered in some quarters here on a basis of $6.15 for chestnut; $4.40 for pea; $2.90 for buckwheat; $2.40 for rice, and $1.65 for barley.

BUFFALO

Dealers are ordering as needed and a fair amount of trade is reported, though there is not much inquiry for beyond winter requirements. The strike talk is producing little effect, the general feeling among dealers being that coal will be cheaper and that it will pay to wait before adding largely to stocks.

Some inquiry is being made regarding the chartering of Lake vessels for the coming season, and it is expected that something will be done in this line soon. Last year was a heavy shipping season in anthracite, and stocks are said to have been holding on a little longer than usual at the upper docks.

PHILADELPHIA

Dealers are laying by a moderate tonnage, most of them being content if they can get enough to carry them a month. There is also the occasional exception of a dealer who is letting stock run down to almost nothing. There is certain to be trouble in the anthracite region, and the people at the mines are in readiness for a period of idleness.

There has probably never been a time when so many "short orders" have been received, and these small orders are really the life of the retailer now. Many dealers are circularizing their customers, giving them the present status of the mining situation. Generally the advice is that, while future prices are bound to be lower, it is the part of wisdom for the consumer to have at least enough coal on hand to finish out the season prior to April 1.

Most of the companies are about booked up for the balance of the month on stove and nut, and some have enough egg to finish out. Pea is still extremely plentiful. As to retail prices, the threatened strike has had the effect of making for solidarity among the dealers.

Buckwheat is still inclined to lag. Barley still maintains its boom, and the production is quickly moved. It is believed that the concerns stocking buckwheat are fast reaching their limit.

ANTHRACITE FIELDS

Rainy weather has caused an inflow of water at many mines, and a few have been forced to close down part of their workings. A strike of steam shovel engineers, due to seniority rights, has been called in the Hazleton region, which has affected stripping operations.

Productions fails to show much stimulation. However, were it not for the strike impetus conditions would be deplorable. If there is no suspension on April 1 we may look for exceedingly slack times during the spring and summer.

BOSTON

While there has been steady retailer buying there is at the same time no real snap to the business. In general this probably reflects the attitude of the public that domestic sizes are much too high and that the coming discussion of wages will result in a very material reduction. In any case, consumers are not being scared over the outlook and unless there is newspaper agitation in April it is quite possible there will be no very much increased demand while negotiations are in process.

Meanwhile, the weather is so springlike that actual household needs are small and do not encourage the retail distributor to replace what little he is moving. There has been no change in retail price here since early in the year and it is not likely there will be any modification until a spring basis is announced.

BALTIMORE

Dealers are not making any attempt to store much coal in preparation for the strike. They have felt that to purchase any considerable quantity of coal at the present schedule of prices, when a strike settlement might catch them with much fuel on hand gathered at a price higher than the then prevailing rates, would be unwise.

Much interest is taken here in a bill introduced in the legislature to have a uniform 2,000 pound ton in Maryland. The practice has been to sell soft coal on the net ton basis in most cases, while hard coal is sold to the public on the long ton basis. The ton prices of Baltimore would of course be adjusted to the new condition, and on the face would show a cut of $1 or more. As usual, there will be opposition and charges that the coal men are trying to put one over, but it is hoped that common sense will prevail in the consideration of this important matter.

South

BIRMINGHAM

There is a little better spot demand than there was a week ago, and also some inquiry for contract business from utilities. Some few twelve-month agreements have been signed up, although the tonnage involved is not extensive. The principal encouraging feature is the presence of a better feeling in trade circles, though there is nothing as yet either in the way of actual bookings or indications that the industry has turned the corner definitely to create any great amount of optimism.

The railroads are taking a much heavier tonnage. The Mobile & Ohio has closed a fuel contract with mines on its lines in Tuscaloosa County for a twelve-month period for a tonnage reported to aggregate between 250,000 and 300,000 tons or its entire yearly requirements for its lines south of Okalona, Miss. This is the first time that coal for this system has been purchased in the Alabama field, having formerly been acquired from Illinois producers. Proposals covering the fuel needs of the Louisville & Nashville and the Frisco lines normally taken from this district are expected in the local market shortly.

Production has gradually climbed since the beginning of the year from 220,000 tons to 275,000 tons for the week of Feb. 25. From present indications production for the week of March 4 will be about the same as the previous week. Increased output is due in a large measure to a heavier movement of railroad fuel and additional blast furnaces put in operation.

VIRGINIA

Production gains at the outset of March brought the total output up to more than 70 per cent of potential capacity. Many mines heretofore in idleness were able to resume operations. The improvement was particularly noticeable in the Clinch Valley section. The increase is attributed to a heavier steam demand. This has stiffened prices to a slight extent.

Chicago and Midwest

Demand Slackens; Stocking Program Seems Near End

Buyers Other Than Railroads and Utilities Rely on Present Stocks and Non-Union Supply—Market Softening—Eastern Producers More Cautious in Consigning Tonnage Here.

Slackening demand is daily becoming more apparent. With the exception of railroads and utilities, consumers are taking less tonnage as a strike safeguard. This stocking program appears to be nearing its end, as the buyer feels that reserve supplies, augmented by non-union coal in the strike emergency, will be sufficient to tide over the mining suspension. Those consumers who have definite manufacturing plans are generally protected with a 60-day reserve supply of fuel, while others say they will not be embarrassed if forced to close down on account of a fuel shortage.

The softening condition of the maret has checked the flow of non-union coal. Eastern producers are more cautious in their consignments to the Midwest, as considerable tonnage has been sold recently under forced conditions, to avoid demurrage. Production in Indiana has suffered most from the low-priced Eastern invasion. Illinois producers have been able to market their production with a minimum of "no bills."

At the end of the week there was nothing encouraging in the Midwest trade as viewed from Chicago. Sales managers who have persistently been optimistic through the past weeks could see nothing but uncertainty from now until next fall when everybody agrees the mines will be back at work and industrial demand will be better than it is at present, but still not greedy for coal. The movement of coal from Illinois, Indiana and the non-union Eastern fields into this region has been rather unsteady during the past few days but prices have not wobbled wildly. Only a few declines have been recorded in spite of the fact that on one or two days the badly spotted market nearly blanked out demand entirely.

Eastern coals of the class that seldom appeared in the Midwest until this season, have not been flooding the region in spite of their price advantages over the Illinois and Indiana products. Doubtful demand has seen to that. No longer do companies start long trains of it toward Chicago, billed to themselves, confident that the market would be ready for it when it arrived. Buying has been so careful that last week's habit of purchasers insisting upon car numbers on everything they bought has continued. The trade has grown so finicky, in fact, that one sales agency on Saturday even declared there was an epidemic of refusals abroad in the land. Other companies with headquarters in Chicago insisted they had seen nothing of that.

The general opinion is that stocking is practically finished and that nobody, unless it be the railroads, has any intention of winding up the month with a rush into the market. Most consumers are trusting to a short strike and to the much-heralded supply of non-union coal. Those manufacturers who are actually busy and expect to remain so through the summer are stocked for at least 60 days. Those who are doing little business are stocked not at all and will close up shop, if need be, without great pain.

Demand from centers in the West and Northwest served by Chicago is nearly as dead as it is in the city. Country demand would be down to nothing were it not for a very slight tendency displayed by some detailers to lay in small piles of stock.

Production in the Midwest has been fully as spotted as the market. Indiana, suffering most from the Eastern low-price invasion, has been hard hit and Illinois mines, as a whole, are a little below last week. Reports in the middle of the week showed less than 100 cars on track in Williamson and Saline countries, which is practically nothing.

CHICAGO

The Chicago market displayed no marked tendencies one way or the other during the past week except that at the end most coal men felt discouraged as they looked into the immediate future. There can be no doubt that consumers have been apathetic toward the strike and the dangers that may develop in it for them.

Stocks in the hands of public utilities and factories locally vary from 90 days down to next to nothing and most operators agree that stocking for the strike is completed. There remains for the rest of the month, then, little business to be had beyond caring for normal consumption, which naturally is low, and supplying retail dealers with a little extra stock.

Bituminous prepared sizes have been slow all week though there has been no change in prices. Quotations have ranged \$3.25@\$3.65 on this class of coal from southern Illinois over a period of several days, though central Illinois prepared sizes have notched downward about 25c. to a level Saturday of \$2.65@\$3. Screenings continue unpopular with hardly any from the southern Illinois fields selling for more than \$1.75 at the end of the week and with central Illinois quotations ranging \$1.50@\$1.85. Belleville screenings showed a slight downward trend to \$1.10@\$1.35 which represented a slump of approximately 15c. Indiana coals held firm.

Pocahontas and New River shipments to this market have been moderate during the week. Prices have gone down a hair's breadth on prepared sizes to \$3@\$3.25.

There is nothing interesting in anthracite. Most consumers appear to have on hand enough to finish out the winter. Balmy weather most of the week has roused no demand worth noting.

LOUISVILLE

Demand is duller all along the line and prices are weaker. There is some demurrage steam coal on the market, but it is being cleaned up fast. Some very good lump is quoted \$2@\$2.25 from eastern Kentucky, but mine run is firm at \$1.25@\$1.65. Harlan districts are paying the 1917 scale, while Hazard has cut under that level.

Block will probably be hard to move from now on, which will result in stiffer prices perhaps for steam coals. Prices today are closer together than for a long time, the cheapest screenings being around \$1.10, while some lump is quoted as high as \$2.60@\$2.75 a ton. However, it is hard to sell lump at over \$2.25.

ST. LOUIS

Domestic buying is unusually slow. Orders are for the cheaper grades and in smaller quantities. The statement in a daily paper that there would be no shortage of Illinois coal but that if there were there would be a sufficient supply of non-union coal to fall back on had the effect of stopping all prospective storage of coal for the local plants and has changed the general tone of the market.

The manufacturer is not figuring on any coal shortage and judging from the way the householder is buying spring ought to be here the first day of April and summer a few days after.

Country buying is light, especially on steam. Very little is moving. Country domestic business has picked up a little on account of the colder weather.

SOUTHERN ILLINOIS

A falling off in everything except screenings was noticeable last week. Dealers do not seem to be getting much coal other than for current needs. Railroads are still buying heavily, but it is understood that they are going to bank on the last week's supply, which will be held in cars.

Cars are plentiful, although movement on some roads is a little bit slow, especially the Burlington and the Missouri Pacific.

There is considerable dissatisfaction on account of the poor working time which has caused the miner to decide that he must not take a reduction in the scale when he cannot live on the present wage with the work offered.

Throughout Franklin County in many mining communities there is absolute distress and hunger in the families of miners who have been out of work for several months. This is getting so pronounced that the municipalities are taking steps toward helping.

Duquoin and Jackson field conditions are somewhat similar to those in Carterville. Some mines have been idle for many months and a few operations are shortly to be sold under the hammer. In the Mt. Olive district a little better working time is noticeable the past week on account of storage coal for Chicago and a little movement to Omaha and Kansas City. Prices, however, are not strong.

The Standard district plugs along without anything of particular interest. Some mines get as much as four days a week. Others, however, have been idle for a year. Prices are at cost of production or below. A little mine run is being loaded for railroads but this is not general. The railroads do not seem to be buying as heavy in this district as they usually do at this time.

WESTERN KENTUCKY

Movement of coal is slower and prices weaker. Some contract customers are well stocked, and many large industries which have been buying screenings freely are holding up shipments due to large stocks on hand.

It is believed that within a few days lump demand will again be very slow, with screenings scarce and stiffer in price. A decisive statement relative to the strike would probably start mine run moving much better, but just now the market as a whole is very dull.

Mines are operating part time with plenty of cars and no shortage of labor. However, until the strike looks more serious it will be no easy matter to interest buyers.

Coke

BUFFALO

Foundry coke is scarce and some producers are not quoting, while others have been making higher prices. The coke market generally is stronger and delays are encountered of as much as two weeks on the shipment of some sizes.

Prices are $4.50@$4.75 for 72-hr. Connellsville foundry, $3.50@$3.75 for 48-hr. furnace and $3 for the smaller sizes, with $3.64 added for freight.

UNIONTOWN

There have been no market developments during the past week, other than a slipping back to the old stage of no buyers. Following the sudden flurry in the coke market of two weeks ago, furnace, while not soft, does not have much demand and production for open market delivery is being made only in a limited tonnage.

The same difficulty is experienced in selling coal. The only demand found here is for carload lots. Sewickley steam is quoted $1.30@$1.45 with Pittsburgh steam at $1.50@$1.65 and byproduct, $1.65@$1.75.

CONNELLSVILLE

The spot coke market has easily held its own in the past week, while inquiry against second-quarter contracts has been more active.

There is a slight trend in the direction of blast furnaces going in. A moderate sized second-quarter contract has been closed at $3.50, for a high grade of coke, this comparing with a recent contract at $3.25. A Buffalo interest, operating byproduct ovens with its own union-mined coal, inquired first for Connellsville coal to take care of its requirements after April 1, and on being quoted $2.25 or thereabouts issued an inquiry for coke, which is now pending, prices of $3.50@$3.75 having been quoted.

Many comparisons are being made in the trade as to the relative profitableness of coal and coke sales at the present time, but as there is a wider quality range in coal prices than in coke prices the comparisons are not very illuminating as to actual conditions.

The coke market is quotable at $3.25@$3.50 for spot and contract furnace and $4.25@$4.75 for spot and prompt foundry.

The *Courier* reports production during the week ended March 4 at 69,020 tons by the furnace ovens, and 43,690 tons by the merchant ovens, a total of 112,710 tons, an increase of 6,980 tons.

Northwest

Coal Traffic Increases; Price Market Is Firmer

Fear of Prolonged Mining Suspension Creates Disposition to Lay in Reserves — Uncertainty in Many Quarters — Some Procrastinate — Others Play Safe.

Northwestern markets are quiet, but small lots are moving readily. Docks have enough orders in hand for ten days steady operation. Some fear that dock stocks may be depleted by a prolonged mining suspension has caused more of a disposition to buy reserve tonnage during the past week. However, much uncertainty prevails as to the proper course to pursue. Many prefer to postpone buying until the last moment, while others are playing safe and taking in more coal than they need for immediate requirements. The aggregate result is a firmer price market, with traffic showing an increase. Industrial conditions are improving, but very slowly.

MINNEAPOLIS

The trade continues to be in a most perplexed state of mind over the policy to pursue with reference to buying for demands after the first of April. It is known that there is an ample supply of coal, both soft and hard, for a considerable length of time, two or three months or more. If it could be assured that the difficulties attending the wage settlement could be adjusted and work resumed in time to supply the Northwest for next winter, the answer would be plain.

There is no danger of the Northwest being short of fuel of any kind for the next three months. But if the stocks on the docks are absorbed and the late summer and fall do not send forward enough coal for the winter of 1922-23, then there will be trouble. But those who lay in their supplies from present stores may be able to meet their early fall demands, while others less provident are without coal.

It is regarded as reasonably sure that the outcome of any strike will result in lower production costs. Hence those who buy on present costs may have high-priced coal on their hands while those who defer, may have cheaper coal to offer in competition.

Steam users are storing away a reasonable supply of fuel against the certain suspension which is set for April 1. Larger users like street car companies are putting in all that they can care for. But most of the lesser consumers are not inclined to give much heed to the threat of a fuel shortage.

The certainty of a shutdown has resulted in strengthening prices on soft coal. It is likely that there will be some other price changes, as the season draws on, and the strike becomes more assured. The sentiment in the coal trade here is that the operators ought to hold out for a complete revision of the arrangements which have been allowed in previous wage agreements, and to insist upon doing away with the grosser impositions.

DULUTH

Shipments from the docks aggregated 18,276 cars during February, according to official figures. This is less than the January shipments of 24,521 cars, but is much greater than during February last year, when but 7,450 cars went out. Duluth docks shipped 6,173 cars and Superior docks 12,103 cars. The decrease in shipments was due entirely to the week of heavy snow which the country suffered here.

As a result of the cold weather sufficient orders are on hand to carry the docks for a week or ten days to come. A shortage of cars which threatened to be serious last week has been cleared up.

Youghiogheny, Hocking and Splint have been advanced 50c. by retail dealers, in response to the advance from docks last month. Anthracite stands firm at levels before quoted. It seems probable that hard coal has seen its last advance for the season, but no lowering of rates is contemplated.

Some apprehension is felt that the threatened coal strike will not be settled before dock stocks are depleted. Following this line of reasoning, many large manufacturing plants are showing a disposition to place more orders.

MILWAUKEE.

The market is quiet, but dealers report a steady demand for small lots. Buyers are only taking enough for immediate needs.

There is no disposition to shade prices, notwithstanding the approach of the Lake season, as stocks are being husbanded in anticipation of strike trouble. The docks hold enough coal to last 90 days or more, and the coke supply is sufficient to last until July.

The anthracite situation is the poorest, of course, but a strike, if it occurs, will find hard coal demand at the lowest ebb of the year. Receivers here say there is a large supply of soft coal on the docks near the mines, which will begin to come as soon as navigation opens.

Eastern Inland

Industrial Gains Hold Promise for Coal Trade

Based on Recent Low Consumption, Market Is Nearly Saturated—Strike Needs Discounted by Non-Union Activity — Prices Show Softening Tendency.

Coal stocks are fast approaching the point where they may be considered adequate for a long period, based on present low requirements. The strike needs are being greatly discounted as non-union operations are so active. It is felt that these coals, coupled with reserve piles now on hand, will fill all demands that may be made, even in the event of a prolonged strike. The result is that the market is nearly at the saturation point and prices show a softening tendency.

Real encouragement is felt, however, by the increasing industrial consumption. Iron, steel and allied manufacturers, which form the backbone of the industrial structure here, are operating on heavier schedules, thereby promising larger coal orders.

PITTSBURGH

The Pittsburgh Coal Producers' Association has issued a formal statement to the public, outlining in detail its position on labor matters, which the trade has clearly understood for two months and more past. The operators reiterate that they are willing to meet the men of the district to negotiate a wage scale without the check-off.

Miners have evinced no desire to enter into a district conference and it is generally assumed that the whole moral force of the national officials of the U. M. W. will be used to discourage them from doing so. There is more divergence of opinion than formerly as to the size and duration of the prospective suspension, as there are now a few observers who express the opinion that the suspension will not amount to much.

There is no material increase in the volume of coal mining but the common opinion is that the turnover has been running decidedly heavier for a couple of months than would be the case if no labor trouble were in prospect. Holders of contracts have also been taking heavier deliveries. Demand upon the non-union fields seems to have been slightly lighter in the past two or three weeks.

The market remains quotable approximately as follows: Steam slack, $1.30@$1.50; gas slack, $1.60@$1.70; steam mine run and ordinary gas, $2.10@$2.20; ¾-in., $2.60@$2.75; Panhandle 1¼-in. domestic lump, $2.75@$2.90; high grade gas, mine run, $2.75@$3; ¾-in., $3.25@$3.50.

BUFFALO

Business is on a less satisfactory scale than for months past. Very few inquiries are now being received. The strike talk fails to make any impression, and evidently the effect has been discounted by laying in of supplies during the past two months.

Action has been taken by the Buffalo Chamber of Commerce and other similar organizations to advise consumers to lay in a stock of coal to last for at least six weeks, but, as many have already done so, little new business has resulted. Coal men say their letters of warning along the same line have brought out few inquiries or orders.

The trend of prices has been downward, except in slack, which holds steady. Steam and gas slack, however, are not now selling as far apart as formerly. Prices are; $2.60 for Youghiogheny gas lump, $2.35 for Pittsburgh and No. 8 steam lump, $2.10 for Allegheny Valley and other mine run and $1.70@$1.80 for slack.

CLEVELAND

Actual softness has crept into the situation in the last few days and prices seemed less steady than for some time. The only note of encouragement to be found is the evidence of growing consumption by industries. Even though slight, this development contains more real promise than any buying movement in anticipation of the strike could be.

There has been no increase in industrial storing. Lack of ready cash, expectations of lower prices, uncertainty over future needs, and some doubt that the strike will be so prolonged as to cause serious coal shortages, have combined to restrain buying. The industrial stock pile in and around Cleveland is sufficient to last for from 30 to 60 days, according to best estimates. Public utilities have enough fuel on hand to run for 60 or 70 days.

Together with the stock-pile and the inflow of coal expected from non-union regions, consumers seem to be content to take their chances. Many believe that after the first motions of a strike have been gone through and certain mental stages of excitement have been enjoyed, that the union men will be ready to face brass tacks.

Receipts of bituminous coal show a marked recession from the high point of two weeks ago, when something over 2,000 cars were received during a single week. Receipts for the week ended March 4 were 1,516 cars, divided; 1,134 cars to industrial concerns and 382 cars to retail yards.

EASTERN OHIO

An impending coal strike is apparently affording little added stimulus to production, as the ratio of output refuses to rise above the figure prevailing during the past few weeks. Output during the week ended March 4 was 385,000 net tons, or approximately 60 per cent of rated capacity, as compared with 64 per cent during the preceding week of five work-days. However, tonnage mined exceeded that of any week since the middle of November. Association mines are operating at about the same schedule as shown for the field as a whole.

Public utilities and railroads are either well stocked for any emergency or will be within the next ten days. Likewise, retail dealers advise that their steam trade has been taken care of, and domestic consumers generally have put sufficient coal in their bins to tide them over the remainder of the winter season.

Operators and jobbers claim that more or less lethargy has overtaken demand from which it is apparent that the markets served by eastern Ohio are fast approaching the saturation point.

Barometer reports from Ohio industrial centers are very optimistic with particular reference to a spurt in steel products for automobile manufacturers who are now operating on greatly increased schedules. Railroads report consistent increases from week to week in the number of loaded cars handled through the various terminals. Likewise there is a noticeable decrease in the number of unemployed.

COLUMBUS

With the stronger probabilities of a strike looming up there is some quiet buying of steam grades for stocking purposes. Steps to avoid the impending strike have proven unavailing so far and the public is gradually coming to a realization that it is almost sure to come.

Considerable tonnage is moving. Prices, however, have not increased and a large part of the tonnage is being supplied by the mines of Kentucky and West Virginia.

Little increased buying on the part of dealers is reported. Apparently stocks are sufficient for the present and retailers are not anxious as yet. Retail prices are fairly steady at former levels. Orders are generally small as householders are only buying for the present, believing that freight rates may be reduced soon.

NORTHERN PANHANDLE

There is a little better market, although the demand is by no means as strong as it should be. Public utilities and railroads are a little more interested, but among commercial users a spirit of indifference appears to prevail. The general drift of coal is to Northern and Western markets.

DETROIT

Very little coal is being sold. The reports of impending trouble in the mine fields seem to be giving little anxiety to local buyers. There is no special effort being made to create reserves. Buyers feel that they will be able to obtain coal in sufficient quantity from the unorganized mining districts if necessary.

The retailers are practically out of the market. Their one desire seems to be to get their yards as nearly empty as possible before April 1.

Pittsburgh No. 8 1¼-in. lump is $2.35, ¾-in. is $2.15, mine run $2, nut and slack, $1.85. West Virginia 4-in. lump is $2.50, 2-in., $2.25, egg, $2, mine run, $1.50, nut and slack, $1.35. Hocking lump is $2.75, egg, $2.25, mine run, $1.85, nut and slack, $1.50. Smokeless lump and egg is $3.25, mine run, $2, nut and slack, $1.50.

Cincinnati Gateway

Buyers Gorged with Coal; Price Increase Unlikely

Interest in Spot Market Active—Little Additional Tonnage Moving—Most Orders Filled by Non-Union Operators, Some Working Nearly at Capacity.

Active interest is being shown in the spot market but not much additional tonnage is being moved. Non-union coals are filling the majority of orders and operations are almost at capacity in some of these sections. Stocks and preparations for the strike have been well anticipated by many buyers and most of them are gorged with coal. This precludes any price increase on current offerings, and where quotations have been boosted the order falls through, for there is plenty of coal to be had and competition is too keen to permit an upward trend.

Domestic demand is fast becoming dormant with the approach of spring. Uncertainty prevails throughout the trade and all factors mark time before making contract plans.

HIGH-VOLATILE FIELDS

KANAWHA

Buyers are taking a little more steam coal but operators are precluded from entering actively into the market owing to the fact that so many of them are unable to compete with non-union costs. There are a few mines where wages have been reduced and where operations have been resumed. Retail dealers are drawing in their horns as the weather moderates. Hence slack is becoming extremely scarce and prices have stiffened.

LOGAN AND THACKER

Logan production has almost reached capacity proportions. The fear of a strike has stimulated the output to a great extent, the demand being limited to mine run and slack. The principal movement is to the Midwest and down river.

More coal is also being produced in the Thacker field, production being 125,000 tons a week. A shortage of cars is entailing a slight weekly loss. Much of the output is being moved to Western markets, with railroads also absorbing a large tonnage. Mine run is advancing a little, but not more than 10c. a ton at the most.

NORTHEASTERN KENTUCKY

There is a general increase in production but such increase as is observed is limited to the steam grades. The domestic market is very poor, dealers being unwilling to run the risk of becoming overstocked. Prices on nut and slack are almost equal to mine run. There are now only about twelve mines on Big Sandy in idleness.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

Most of the New River mines are now operating on an average of two to three days a week and are finding a market in the East, although shipments of steam grades to Western markets have increased a trifle. New England demands are somewhat restricted by the textile strike although the loss of business in that respect is being offset by heavier storing on the part of other consumers of steam coal.

Although there is a fairly brisk demand for steam grades, yet Winding Gulf producers as a rule are not making anything on their output owing to the low prices prevailing. There is a fairly good market at tidewater, most of the coal so shipped being for New England and other coast markets. Prepared demand is decreasing, placing slack at a premium.

POCAHONTAS AND TUG RIVER

The Pocahontas output has increased, being in excess now of 350,000 tons per week, with a larger percentage of the coal finding its way to Western markets. New England shipments are heavy. Prices are not much in advance of those previously prevailing. The demand for prepared grades is comparatively light.

A car shortage is interfering to some extent with Tug River production. Steam coal demand is not much better than usual, but there is a brisk call for byproduct fuel. Prepared coal is not active and that is resulting in somewhat of a shortage of slack.

SOUTHEASTERN KENTUCKY

Production continues at a good rate, but has not increased to the extent expected. Some little stocking is going on, but buyers are still in control and are naming their prices in most cases. Nut and slack continues in demand, but there has been a further weakening in block and prices are being slashed right and left.

CINCINNATI

Actual orders have not increased at all in proportion to the evidence of market interest recently shown. The possibility of a strike has passed into the certainty stage, at least among the major portion of the Kentucky and West Virginia operators in the non-union fields. This arm of the trade has been bringing pressure to bear to advance prices, but with little success. It only has shown conclusively the April 1 decision has been anticipated by buyers and that most of them are well prepared.

Contract figures are practically nil. No smokeless circular has been issued as yet. Lake prices have not been set and the whole of the trade is marking time to see which way the cat jumps.

Smokeless prices have not changed. Business on lump and egg has sagged. Practically none of the Pocahontas mines are now back on their booked deliveries. There is enough run of mine business to hold the market steady.

Some West Virginia operators are asking an advance of 50c. a ton on their free lump coal—and few are getting it. Kentucky operators are talking of following this lead. Run of mine business on both splints and gas coals is healthy with an upward tendency. The nut and slack situation has not varied in holding the center of attraction and some dealers are now asking $1.50 a ton, with few sales at that figure.

West

SALT LAKE CITY

Retail business is still good, but this is entirely due to weather conditions and not to the threatened strike on April 1. Most people are only buying from hand-to-mouth.

Salt Lake City dealers report the best February business for four years. Stocks are quite low in the city in spite of the possible strike. The anticipation of lower prices is having something to do with this. The unusually cold weather has had the result of improving the wholesale business from 10 to 15 per cent.

KANSAS CITY

More seasonable weather and the strike outlook have had the effect of stimulating buying. However, there was little change in the market, as some of the districts such as Illinois and Colorado are long on certain grades of coal and the chain is only as strong as the weakest link.

Everything points to a bitter struggle between the operators and miners in this district. The miners have had control for several years and the cost of production has just about put Southwestern coal out of the market. Another factor was the degrading of coal that was produced; the primary reason being the overshooting. It looks like a life and death struggle and the outcome will be watched with keen interest.

DENVER

Coal weather has forced some of the striking lignite miners to return to work at a reduction of 30 per cent in wages, not because of their own hardships so much as the fact that idle miners from other sections were ready to take their places, and did so, in many instances.

High freight rates and excessive marketing and labor costs were given by twenty leading mining companies of Colorado as the reason for the proposed 50c. reduction in daily wages of their employees at a formal hearing before the Colorado Industrial Commission. The matter has been taken under advisement.

Operators say the public is demanding cheaper coal, and margins already are so low that the only other course of meeting the public demand, at least in part, is to bring the wages of day laborers back to normal.

Bituminous steam is finding a better market, the mine price being $2.50 and the retail figure $6.60. Lignite steam is $2 at the mine and $5.45 retail. Bituminous lump is $5 at the mine and lignite lump $4.

News Items From Field and Trade

ALABAMA

It is reported that **Moffat Brothers**, with general offices in St. Louis, and operating mines in the Illinois field, have leased a large tract of coal land from **Henry C. Powers**, near Blocton, Bibb County, on the Mobile & Ohio. The Powers interests have a new opening located on the leased property and it is understood that the lessees will rush this development and that a large number of tenement houses will be constructed in the new camp.

The Brachard Coal Mining Co. recently opened a new mine in the Birmingham section and is pushing the development work looking to an early production in the event market conditions improve sufficiently to warrant operations.

COLORADO

Fire, believed to be of incendiary origin, destroyed the tipple of the **Jewell Coal Co's** mine, just north of **Aguilar**, in Las Animas County. Superintendent W. E. Powell reports there is no doubt the tipple was set on fire, because of trouble over employing new men.

Production in Colorado during January was 25 per cent less than during the corresponding month a year ago. January production amounted to 803,709 tons, as compared with 1,059,510 tons in January, 1921, a decrease of 255,801 tons.

The Rocky Mountain Fuel Co., Denver, has equipped its Columbine Mine with a set of Nolan cagers built by The Mining Safety Device Co.

CONNECTICUT

The estate of Annie Chapulis, a nine-year-old girl, of Brideport, received a verdict in the Superior Court at Bridgeport recently, of $10,137 against the **Ideal Coal Co.**, of that city. The little girl and her smaller brother were killed by a coal pocket cave-in last September while at play in their yard, which adjoined the coal company's plant. The company blames the casualty on poor construction work on the part of the builders, but the decision finds that the proper anchorage was not given to the pocket.

The American Coke Co. will have a new warehouse at **Hartford**. The company is now taking bids for the building which will be two stories high, of brick and steel construction.

Dexter & Carpenter, Inc., New York City, has opened an office at New Haven, with Harry W. Hitchcock as manager.

The Karm Terminal Coal Co., Bridgeport, Conn., has recently started something new in coal circles around this vicinity, the establishment of a "Karm Koal Klub," which is divided up into ten classes, from one ton to ten tons. The thing will be run something after the style of the now famous "Christmas Club," and if one joins he pays at the rate of 50c. per ton per week for twenty-six weeks.

ILLINOIS

The Chicago Coal & Unloading Co. has been incorporated with capital of $34,000 by J. E. Cornell, J. E. Cornell, Jr., Lyle Harper and Robert Berkhoff.

Announcement has been made that the **Manhattan Coal Co.** will start a shaft in the near future for a new coal mine near East Peoria.

The Illinois Coal & Coke Corporation, which now owns about 28,000 acres of coal land in Jefferson County, has plans for the sinking of a large shaft soon.

The Consolidated Coal Co. is now taking out motors, machines, telephones and other machinery from its No. 9 mine at Murphysboro. The mine was flooded by water late last year and the company has decided that it will be cheaper to abandon the mine rather than spend approximately $100,000 in the work of reclaiming it only to get the 18 months more work which remains in the workings.

Mack Elders, general superintendent of mines No. 18 and 19 of the By-Products Coal Co., West Frankfort, has been transferred to mines owned by the company at Shelbyville.

It is understood that, effective April 1, the **St. Louis Coke & Chemical Co.** will take over and operate the Black Brier mine south of Johnson City, which has been operated for it by the Chicago, Wilmington & Franklin County Coal Co.

The Peabody Coal Co. last week bought the **Carterville & Big Muddy Mine** at Carterville. The mine has a capacity of 1,500 tons daily as it stands. The property includes 375 acres of unmined coal. For the time being it is closed down for the installation at once of a washery and a new picking table and loading booms. The mine adjoins the Federal Coal Co.'s property, another Peabody holding, but will be operated on a separate basis. M. F. Peltier, vice-president in charge of engineering, said the Peabody company does not contemplate buying any more mines in the vicinity.

Andrew Maloney, vice-president and sales manager of the C., W. & F. Coal Co., is back from a rest in Florida, where he "never let coal even enter his mind." This establishes a record for long distance mental control among all weights of coal men.

Loyal rooters for the **Peabody Coal Co.** who are proudly watching their company's growth, are pointing out so that none may overlook it, the fact that the company's total production for the month of February was 829,000 tons. About one-sixth of the company's mines are shut down. It is the opinion of the company's officials that Peabody production in 1922 is leading the entire country, not excepting the Pittsburgh and the Consolidation coal companies.

INDIANA

Even the recent triple cave-in of its best mine at Princeton—the worst mine collapse Indiana has seen in years—does not discourage the **Deep Vein Coal Co.** Ridgely Rea, Chicago manager, says the company would have been forced to close up the caved-in old shaft soon anyway, and that there could be no better time for sinking the new one a mile south than right now. The total loss to the company ought not to be over $100,000 even though the old shaft is ruined and part of the power plant and the hoisting machinery fell into the abyss while four electric locomotives and between 300 and 400 steel mine cars, are underground and probably under water. The company's new shaft will be started at once, Mr. Rea said. He thinks most of the engulfed machinery can be salvaged.

KANSAS

Mines No. 18, 19 and 20 of the **Western Coal & Mining Co.** have been cleaned up and are ready for operation.

Development has reached the point of production in the **Green Valley Mining Co.**, Pleasanton. The mine is now in position to ship commercial coal.

KENTUCKY

K. U. Meguire, of the Harlan Coal Co., Louisville, has been visiting the Pineville and Harlan sections of the field.

B. P. Reed, of Louisville, who is connected with the Sackett interests who have large holdings near Pineville and on Pucketts Creek, Harlan County, was in Pineville a short time ago.

The Moss-Chamberlain Coal Co. of Covington, of which Sid Moss of the United Collieries Co., of Cincinnati, is the guiding spirit, has increased its capitalization and will acquire retail yards in Newport.

Amended articles have been filed by the **Keel Coal Co.**, Pikeville, increasing its capital stock from $45,000 to $75,000.

The Kentucky Court of Appeals has decided two coal cases coming up from Floyd County, the Floyd County Circuit Court decision being reversed in the case of the **Royal Elkhorn Coal Co.** against the **Elkhorn Coal Corp.**, which is a condemnation proceeding involving a strip of land 60 x 100 ft. A trial of the case is ordered. The case of the **Auxier Coal Co.** against **L. Blenkinsopp** and the **Big Sandy & Millers Creek Coal Co.** from Floyd County, was affirmed. The question in the case was whether under the terms of the contract there was not sufficient coal on the lease to continue mining, and the jury having held that the coal supply has been exhausted and the land might be sold the court would not disturb this judgment.

MICHIGAN

John I. Thomson, well-known coalman of Detroit, who was connected with Ayers & Lang for a number of years, is now one of the representatives, in Detroit, of the Superior Colliery Co.

D. P. Rickenbaugh purchased the coal yard of **Coppins & Leisenring** at Hudson.

NEW YORK

Noel Cunningham, formerly connected with the Coal Washing Equipment Co., has now become associated with the Hardinge Co., Inc., New York City.

J. G. Miller, Norfolk manager of Raleigh Smokeless Fuel Co., was in New York and Boston recently. **J. B. Clifton**, president of that concern, has returned from South America.

The agreement entered into between the **Coal Merchants' Association of New York** and the **International Union of Steam and Operating Engineers Local No. 20**, provides that if at any time within the present year a reduction is made in the cost of mining coal, or the freight rate on coal is reduced, and the cost of living is also reduced, so that a material reduction is to be made on the price of coal to the public a revision of the wage scale may be called for upon thirty days' notice by either party. In the event of failure to agree, arbitration must be had.

The Paul Breathing Apparatus has been officially approved by the Mines Department of the Home Office in England. It is the first foreign made apparatus which has ever received the official approval of the English Government. **The American Atmos Corp.** is the manufacturer.

OHIO

A visitor in the Cincinnati market a short time ago was **Richard Williams** of Huntington, who is the president of the Glogora Coal Co. of that city.

Quin Morton, vice-president of the Ft. Dearborn Coal Co., with headquaters at Charleston, was a recent visitor in Cincinnati.

The Wheeling & Cleveland Coal Co., Bridgeport, has been chartered with a capital of $50,000 to mine coal in the Pittsburgh No. 8 field. Among the incorporators are W. V. Frazier and A. Dettrich.

The Western Coal Co. Cincinnati, has been incorporated with Herman Everett, president, Tom Dew, vice-president and treasurer, and W. C. McKnight, secretary. The capitalization is $100,000. F. H. Dunker, who for twenty-one years was connected with the John T. Hesser Coal Co., joins the new company as sales manager.

The Boone Coal Co., has taken offices in Cincinnati. It is organized under the Ohio laws with a capitalization of $100,000. M. F. McDermott is the president, John Emslie vice-president and Wheeler Boone secretary and treasurer. It has taken over the business formerly conducted under the firm name as the Boone Coal Sales Co.

The Ebony-Diamond Coal Co. has been organized and is now located at 923 Union Central Bldg., Cincinnati. W. J. Newhall, formerly of the Stevenson Coal Co., is president and Lewis J. Leibold, secretary-treasurer.

The Ohio-Tennessee Coal Co. has opened an office in Cincinnati with J. W. Angey and H. Hutton in charge of sales. It will specialize in coals originating on the Cincinnati Southern and the L. & N.

The Houston Coal Co., of Cincinnati has filed an amended suit against the United States Government seeking to recover $314,000 as the difference between the price allowed by the Navy for coal that had been requisitioned from April, 1920, to April, 1921. On its first attempt the case was dismissed by Judge John Weld Peck in the United States District Court who held that the acceptance of the Government's price closed the deal. The Houston company now allege that they were forced to accept this price because of "threats made by the Secretary of the Navy through Navy officers." The nature of these threats are not set out in the petition.

OKLAHOMA

The Okmulgee County Coal Co. has been organized at Oklahoma City, for the purpose of developing extensive coal lands in Okmulgee County. The company is capitalized at $250,000. The incorporators are Charles E. Froce, George C. Brown and Emile Hemming, all of New York.

The Oklahoma State Coal Exposition and King Koal Karnival has been organized at Henryetta, and is now operating under a state charter. The general committee has perfected its organization and is now laying plans for the second annual exposition to be held June 12 and 14.

Announcement is made that a special course of study for mine superintendents, pit-bosses, gas-men and hoisting engineers will be offered soon at the **Oklahoma School of Mines**, at Wilburton. These instructions will be placed within the reach of every miner in the state and the course will include purely practical problems.

PENNSYLVANIA

The Pennsylvania State Water Supply Commission has granted permission to the **Anthracite Production Corporation** to dredge coal in the Susquehanna River at Holtwood.

When a corporation invests money in a Pennsylvania enterprise the whole of the investment is subject to state tax, and it makes no difference whether a mortgage figured in the transaction or if the market value of the investment became less after the deal was put through, according to a decision rendered by the Dauphin County Court. In the case of the **Weirton Coal Co.**, a West Virginia corporation, which bought coal land in Fayette County for $2,000,000, paying $300,000 in cash and furnishing a mortgage for $1,700,000, the court said the company must pay the state tax on the entire $2,000,000, or $6,666.67. The company also argued that the coal land is not being worked and that the investment today is worth less than $2,000,000.

Honesdale is to have another coal sales station, which will make three for the town and immediate vicinity. The new concern is headed by **Chauncey Bates** and associated with him is **Kenneth Uglow.** Modern coal chutes and office will be erected on the Delaware & Hudson track, the coal being received from the Jermyn Mines, Scranton.

Daniel Whitney, president of Whitney & Kemmerer, with New York offices, has been appointed chairman of the Merchant Marine Committee of the Philadelphia Chamber of Commerce.

Hubb Bell, of the United States Testing Laboratories was the speaker at a recent semi-weekly luncheon of the New York Coal Trade Club, at the Whitehall Club.

James B. Smith, chairman of the engineering commission, E. F. Blewitt Anthony Mayer, Joseph Reese and Thomas Kennedy have made their report on the conditions obtaining at the **National Colliery**, in South Scranton, which has been closed since Jan. 13. A committee from the Scranton Surface Protective Association has called on Mayor John F. Durkan to urge him to use the police power to close the mine as was done in the case of the Oxford Colliery of the Citizens Coal Co.

E. M. Keiser, has been appointed on the sales staff of the Empire Coal Mining Co., Philadelphia, to cover Harrisburg, Lancaster, Reading, Easton and intermediate Pennsylvania territory.

Coleman & Co., Inc., has been formed to market the product of the Ebensburg Coal Co. Offices will be in Philadelphia and New York. O. Dawson Coleman, Philadelphia, is president of the Ebensburg Coal Co., and also of Coleman & Co., Inc. W. B. Calkins has been retained by the operating company as consulting engineer in full charge of matters of preparation, service and tests.

A new anthracite industry was started recently by **Mason & Hall Hoover**, whose coal-reclaiming outfit had been stopped in the Susquehanna by ice. They erected huge posts and installed their coal screening machines on the ice. Then holes were cut and a suction dredge put to work. For many years the men who have been dredging coal from the Susquehanna have been tied up in the winter months, losing thousands of dollars.

Iron Trade Products Co., head offices Pittsburgh, announces the appointment of **Huntington Downer** as manager of its iron and steel department with headquarters at Pittsburgh.

After a shutdown of five months, the Curtlsville Mine of the **Ford Collieries Co.** near Russelton, has resumed. The mine is the biggest in the Russelton district.

W. W. Inglis, president and general manager of the Glen Alden Coal Co., underwent an operation at a Scranton hospital a short time ago.

The annual examination for certificates for mine foremen, assistant foremen and fire bosses in the Ninth Bituminous District will be held in Connellsville April 11, 12, 13 and 14. Applicants must notify the chairman in writing six days before the date set for the tests.

William A. Webb, president of the Empire Coal Mining Co., has sailed for a pleasure trip to the Bahamas. He expects to spend some time at Nassau.

A visitor in Somerset during the third week of February was **Robert E. Rightmire**, engineer of tests of the Consolidation Coal Co.

W. C. Dobbie, general superintendent of the Jamison Coal & Coke Co., spent a few days in Greensburg, recently.

Charging that the **Pennsylvania Coal Co.** is removing a barrier pillar along its main gangway, endangering further use of the mine, the **Suffolk Coal Co.** went into court recently with a bill in equity for an injunction to restrain further removal of the pillar. A temporary injunction was granted.

The Pittsburgh Testing Laboratory announced, at its annual meeting held recently in Pittsburgh, the retirement of its president, Geo. H. Clapp, his reappointment as a member of the board of directors of the company, and the election of Colonel James Milliken to the preseidency of the company.

TEXAS

The Rio Grande Coal Co., of Wilmington, Del., has been granted permit to do business in Texas, and will operate coal mines along the Texas-Mexican border. The company's headquarters will be maintained at Eagle Pass. The company has capital of $2,500,000 and H. P. Mathis is state agent.

The Channel Fuel Co., Houston, announces that its first bunkering plant at Port Houston will be completed and in operation about the end of April. The company will conduct a ship bunkering and general wholesale coal business. The coal will be transported from the Atlantic seaboard to Houston via water and from there distributed to the various towns and cities in Texas by rail. Wharves and a bunkering plant are being constructed at Manchester, on the ship channel. The first unit of dock to be constructed will have dimensions of 250 x 82 ft. and the plant will have storage capacity of 30,000 tons.

WEST VIRGINIA

Negotiations have been closed whereby by the **Jamison Coal & Coke Co.** for the purchase of 700 acres of low-sulphur Pittsburgh coal land from Phillip Sessler and others, the land being near the No. 8 mine of the company at Farmington. In fact, the land extends from the No. 7 to the No. 8 plant along Buffalo Creek. No mention has been made of the consideration. It is thought the deal will be entirely consummated before the end of March.

The Public Service Commission of West Virginia is being asked by coal companies dependent upon the Appalachian Power Co. for power, to reduce the rates for the power furnished. The petition for the reduction was filed by the **Atlantic Smokeless Coal Co.**, thirty-nine other companies joining in the petition. Within the last three year increases in the power rate, granted by the commission, makes the rate double what it used to be. Inasmuch as there has been a marked decline in all the costs entering into the production of power, coal companies feel that the power company should now be willing to agree to a reduction.

The Coal Operators Sales Co., recently incorporated, has opened offices in Huntington. The officers are: F. L. Schoew, president; Geo. W. Coffey, vice-president; V. D. Clark, secretary-treasurer; F. W. Schoew, assistant to president in charge of sales.

Harry B. Clark, one of the well-known operators of the Fairmont field, spent the early days of March in Florida, making the trip by way of Washington.

As a result of the promotion of **F. K. Day** to be general manager of the new properties of the Consolidation Coal Co. in the Pocahontas field, several other promotions have been made by the company. **N. F. Reeder**, formerly district engineer, is district superintendent, with headquarters at Clarksburg, succeeding Mr. Day. **T. A. Hunsaker** is appointed superintendent of Mine No. 38 and **B. F. Harrison** superintendent of Mine No. 24. All those appointed have been connected with the Consolidation for many years. Mr. Reeder has directed the engineering work in the Clarksburg district for a number of years. Although becoming district superintendent, Mr. Reeder will continue to supervise the engineering work in the district.

Ernest Chilson, general manager of the Raleigh Coal & Coke Co., was operated on late in February for gall stones.

Vice-President C. E. Hutchinson of the Hutchinson Coal Co. of Fairmont, left a short time ago for Little Rock, Ark., being accompanied by **Mrs. Hutchinson.**

WISCONSIN

Nothing has yet been done to salvage the 25,000 or more tons of hard coal which lie underneath the ruins of the **Milwaukee Western Fuel Co.'s** anthracite plant in Milwaukee. The coal is a mass of ice and debris, and will probably be out of the market for the balance of the winter.

ALBERTA

James M. Moodie, coal operator of Calgary City, has entered an action against Sir William Mackenzie, Sir Donald Mann, Patric Burns, the Rosedale Clay & Products Co., of Calgary, the Rosedale Coal Co., of Toronto, and the Trust & Guarantee Co., of Calgary. Mr. Moodie is suing on behalf of himself and other shareholders in the old Rosedale Coal & Clay Products Co. with the exception only of those shareholders who are defendants in the present suit. In 1915, when he was the largest shareholder in the old Rosedale company, Mr Moodie claims that he transferred 32,320 shares of the capital stock to Mackenzie & Mann. He now alleges that Mackenzie & Mann, or its agents, wrongfully converted these shares to its own personal use. He alleges, further ,that Mackenzie & Mann formed the Rosedale Coal Co. in 1921, gained complete control of the old company and transferred all its assets to the new one.

BRITISH COLUMBIA

OUTPUT FOR JANUARY, 1922

Mine	Tons
Vancouver Island District	
Western Fuel Corp. of Canada, Ltd., Nanaimo	58,183
Canadian Collieries (D) Ltd.,	
Comox	26,554
Extension	18,477
South Wellington	6,619
Granby Cons. M.S.&P. Co.	26,166
Nanoose Wellington Collieries	8,477
Old Wellington (King & Foster)	553
Total	145,029
Nicola-Princeton District	
Middlesboro Collieries	6,123
Fleming Coal Co.	3,323
Coalmont Collieries	10,014
Princeton Coal & Land Co.	1,921
Total	21,381
Crow's Nest Pass District	
Crow's Nest Pass Coal Co.,	
Coal Creek	35,945
Michel	23,892
Corbin Coal & Coke Co.	4,899
Total	64,736
Grand Total	231,146

The Chu Chua Mining Syndicate is to stop the mining of coal pending the installation of proper handling and dressing machinery, upon which the company will spend $200,000. In the meantime the limits of the coal seams will be explored with a diamond drill. Up to now the syndicate has expended some $150,000 on the development and equipment of the mine.

The construction of a forty-five mile railroad to open up a coal field in the Morice River Region, northern British Columbia, is being asked of the Dominion Government by a deputation of residents of Prince Rupert and the districts adjacent. Such transportation facilities, according to a statement made by the **Prince Rupert Coalfields Ltd.**, would tap a proven reserve of 54,000,000 tons of high-grade bituminous coal. The railway also would give the operators of the Betty Mine connection with the Grand Trunk Pacific. Thus the project would assure a continuous supply of fuel to Prince Rupert and users throughout the north country. Not only this but it would make possible the development of a substantial bunker trade at the port of Prince Rupert.

WASHINGTON, D. C.

The American Federation of Labor in a statement advocating the manufacture of light wines and beer states that prohibition has cut off the consumption of 50,000 cars of coal annually by breweries.

A bill regulating the discharge of smoke from chimneys in the District of Columbia has been introduced in the Senate by Senator Ball, Delaware, chairman of the Senate District Committee. The bill would prevent the emission of smoke of a degree of darkness or cinders equal to No. 3 of Rigelman's smoke chart as published by the Bureau of Mines for more than one minute in any 15 minutes from any smoke stack or chimney in the District.

Director Klein of the Bureau of Foreign and Domestic Commerce says that the following coal interests are co-operating with the bureau in its trade promotion work: National Coal Association; American Wholesale Coal Association and the National Retail Coal Merchants' Association.

The Internal Revenue Bureau has appointed **F. L. Clements** as chief of the Coal Valuation Section of the Natural Resources Division of the Income Tax Unit, succeeding **A. W. Gaumer**, who has been appointed a member of the committee on Appeals and Review of the Revenue Bureau.

The President has signed, thereby making it a law, the act passed by Congress authorising agricultural entries on coal lands in Alaska.

In a Senate debate Senator Heflin, Alabama, said the operation of the Muscle Shoals, Ala., nitrate plant would save the consumption of hundreds of millions of tons of coal.

Traffic News

The Traffic Service Bureau of Utah has filed a brief against the O. S. L. R.R. in behalf of the coal mine operators protesting the action of the railroad company in its alleged discrimination in favor of Wyoming mines.

Application for permission to refinance maturities falling due April 1 has been made to the I. C. C. by the **Erie Railroad Co.**

At the request of the attorneys of coal operators and representatives of various chambers of commerce in Ohio, the proposed hearing on the reasonableness of Ohio freight rates, which was scheduled to start before the Ohio Utilities Commission Feb. 28, has been postponed until April 5. No objection to the continuance was raised by the carriers.

Freight rates from Utah and Wyoming coal fields to Nevada points have been declared too high by the I.C.C., and the carriers are ordered to reduce them by amounts ranging 10 to 20 per cent.

In the complaint of the **City of Detroit**, an I. C. C. examiner recommends that the rates on bituminous coal from Holden and other West Virginia points on the C. & O. to Toledo for trans-shipment via water to Detroit are not unreasonable.

In the complaint of the **Milwaukee Western Fuel Co.**, an examiner recommends that the rate on coal from Princess, Kilgore and Norton Branch, Ky., on the Ashland Coal & Iron Ry., to Toledo, for trans-shipment by water, was unreasonable during Federal control.

By virtue of an agreement between the parties in interest, the I. C. C. has dismissed the case of **Theodore A. Leber** versus the **P. & R. Railway Co.**, Director General as agent, et al. This action, Docket No. 12703, related to rates on anthracite from St. Clair, Pa., to Port Reading, N. J.

In the complaint of the **Cleveland Coal Co.**, the I. C. C. decides that the rates on bituminous coal from South Rivesville, W. Va., to New York and New Jersey points are not unreasonable.

In the complaint of **J. L. Shaluts** an I. C. C. examiner recommends that the rates on coal from the anthracite region of eastern Pennsylvania to Skaneateles, Rose Hill and Marcelius, N. Y., are reasonable.

In a complaint to the I. C. C. the **Kanawha Black Band Coal Co.** alleges unreasonable rates on coal from its mines on the Kanawha Central Ry., to various destinations.

The C. & O. Ry. has asked the commission to dismiss the complaint of the **Nelson Fuel Co.**, which asks for joint through rates on coal on the New River district basis from mines on the Greenbrier & Eastern. The railroad says these rates are already on a depressed level because the three-line haul is more costly than the single-line haul, because the service performed is greater and because application tion of the district rate is not necessary to place the Nelson Fuel Co. in fair competition with mines from which that rate applies.

The Denver & Salt Lake R.R. has requested of the I. C. C. a 15-year loan of $6,500,000 to construct a tunnel through the Continental Divide, to make the operation at this high altitude less expensive and troublesome and to make large coal deposits accessible.

A bill placing railroad construction, including coal docks, under the authority of the I. C. C. has been introduced in the House by Representative Beck, Wisconsin.

In the complaint of the **United Verde Extension Mining Co.**, the I. C. C. has decided that the rates on coal from Dawson, N. M., to Clarkdale and Jerome, Ariz., are unreasonable.

The Clay County Coal Operators' Association, in a brief before the I. C. C., asks rates on coal from mines on the Cumberland & Manchester R.R. which are no higher than those from mines in the Jellico, Ky., group on the L. & N. The L. & N. in a brief says it should not be required to absorb the charges of the Cumberland & Manchester out of an already low rate.

The American Steel & Wire Co. has been authorized to intervene in the case of the **Lackawanna Steel Co.**, relating to rates on coal from the Reynoldsville, Pittsburgh, Connellsville and related coal fields and on coke from the same districts to Buffalo and vicinity.

The proposed adjustment of rate differentials between producing points in Illinois and Indiana and points north and west of those coal fields will be held up indefinitely. This was the outcome of a meeting last week in Chicago of the railroads' coal and coke committee with men from many shipping and receiving organizations. The adjustments were to have been made by the carriers acting under an opinion of the I. C. C. accompanying Ex-parte 74 issued in August, 1920. These corrections were never made because of the various rate protests from Illinois which have been before the commission most of the time since Ex-parte 74 was issued. In last week's conference at Chicago the shippers argued that no adjustments should be made now because the I. C. C. is expected soon to make its decision on coal freight rates in general.

The Fifth and Ninth Illinois Districts Coal Bureau has requested the I. C. C. to conduct a general investigation into all coal rates from mines in western Kentucky, Indiana, Illinois, Iowa, Kansas, Missouri, Arkansas, Colorado and Wyoming, and from the docks to all points in Illinois, Wisconsin, Michigan, Iowa, Minnesota, the Dakotas, Missouri, Kansas, Nebraska and Colorado.

Association Activities

Northern West Viriginia Coal Operators' Association

The position of the association with reference to any change in mining rates is admirably set forth in a statement issued by President A. Lisle White, in which he says, "The coal business is going to improve when it has become adjusted to after-the-war conditions. We might as well all of us understand that a readjustment is coming and get in line with it. It is a national condition that we must take into account.

"With railroad freight rates imposing a handicap on our section in competition with other districts which mine a similar grade of coal, we are now in a position where our competitors are able to undersell us in the open market. Our mines are now running far below their normal capacity and it is safe to say that 90 per cent of the coal coming out of Northern West Virginia is on contracts which expire March 31.

"In considering the matter of a wage scale for the coming year, the association has faced the exact facts as we know them. When that scale is given out, it will provide for the highest wages that can be paid and still leave our field in a position to sell coal in competition with other fields."

Obituary

Alfred T. Grayson, 80 years old, died recently at the Odd Fellows' Home at Manhattan, Kan. Deceased was one of the pioneers of the Kansas coal fields, having had charge of the sinking of three mines at Leavenworth. For eleven years he was superintendent of the state mine at Lansing.

Benjamin C. Masten, aged 32 years, Washington, Pa., war veteran and manager of the Producers' Coal Corporation, was killed recently when the automobile in which he was riding was struck by a street car at Meadowlands, near Washington, Pa.

News of the death of **E. S. Hutchinson**, one of the pioneers of the Pocahontas field of West Virginia, at his late home in Newton, Bucks County, Pa., has been received. He came to the Pocahontas field in 1889 as general manager of the Lick Branch Mine of the Norfolk Coal & Coke Co.

Samuel T. Brush, one of the first coal operators in the southern Illinois field, died at his home at Boulder, Col., recently at the age of 80 years. He organized the St. Louis & Big Muddy Coal Co. His sales agent in St. Louis, Captain Pavey, passed away last week.

Cyrus Garnsey, whose death occurred at Seneca Falls, N. Y., on Sunday, Feb. 19, 1922, was born at Clifton Park, N. Y., on Sept. 28, 1827. He is survived by Cyrus Garnsey, Jr., Hamilton Garnsey and one daughter, Mrs. Lucy G. Russell. Cyrus Garnsey, Jr., was Assistant Fuel Administrator during the war.

Coming Meetings

New England Coal Dealers' Association will hold its annual meeting March 22 and 23 at Springfield, Mass. President, W. A. Clark, Milk St., Boston, Mass.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

Chicago Coal Merchants' Association will hold its annual meeting April 11 at Chicago, Ill. Secretary, N. H. Kendall, Plymouth Building, Chicago, Ill.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 26 and 27 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Fidelity Trust Bldg., Indianapolis, Ind.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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How Many Must Live On a Mine Worker's Wage?

JETT LAUCK, the consulting economist, figures five must live on a mine worker's wage. But is that true? There is good reason to believe that it is unusual. The Insurance Department of Pennsylvania and the Coal Mine Section of the Pennsylvania Compensating Rating and Inspection Bureau have produced a review of experience in the last five years since compensation went into effect in Pennsylvania. It is termed a "Statistical Analysis of Coal Mining Accidents in Pennsylvania." In Table XL we learn that in the anthracite region 406 men were killed and they had 1,008 dependents, or 2.48 dependents to each breadwinner. We also find that in the bituminous region there were 3,083 dependents for 1,388 men killed, or 2.22 dependents to each employee.

Excluding posthumous children, 2,643 children of all ages had to be supported. From this it may be learned that the average number of dependent children for each mine worker is 1.47, and the average number of adult dependents is 0.72, making 2.19 dependents actually in being, or 2.28 dependents in all.

The Coal Industry's Best Customer

HAVING a bucket full of water, how are you to put more water in that bucket? Having a business that throughout the depression of recent months has been operating practically at capacity—a business that normally finds a large outlet for its product in general industry—what may we expect to be the immediate future of that business with demands from industry getting back on its books?

This appears to represent the position of one of the best customers of the steam-coal producer: the public utility and central station. The business of manufacturing power has made great strides in recent years. During the war one industrial after another changed over from the isolated power plant to central-station power. The war industries were run on purchased electricity.

Summer demands for power are the lightest, yet the low point in 1920, in May, was represented by an average output of around 105,000,000 kw.-hr. compared with 95,000,000 in May and July, 1921, the low months in a year of intense depression. From the middle of 1921, the demand for electric power steadily mounted from around 95,000,000 kw.-hr. per day to around 102,000,000 during November and December of that year and January of the present year. In the corresponding period of the previous year the trend was in the other direction.

The inference is plain: as the industrial demand for power comes back the central stations are going to have difficulty meeting it without plant extensions. Approximately two-thirds of the power is developed from fuel; mainly coal. The utilities, the most consistent buyers and consumers of steam coal throughout the depression, will be better customers as the year proceeds. Two general lines of policy for the directing heads in the coal industry are suggested: Make coal sufficiently attractive to the power producer that he will not turn even further to hydro-electric development and, most important, get into the power business before the power business goes further into the coal business.

So Necessary to Lower Price

GOVERNMENT regulation to lower prices of coal usually is excused by its advocates on the ground that coal is such a staff of life that its cost must be kept down. That was done in America by a combination of coal interests in the early part of the war, by governmental regulation later and by Great Britain by both regulation and subsidies.

Strange indeed it is that one government gives up its collected taxes to keep down the price of coal while another makes coal pay a tax. Both cannot be right. Coal should be taxed like chewing gum, soda fountains and movie tickets, or it should go untaxed like wheat or flour, or it should be subsidized; but all three cannot be right. If it does not matter how much coal costs we may conceivably tax it without violence to reason. If, however, we hold it is vital that it be cheap, why single it out for taxation? Pennsylvania is trying to put a tax on anthracite, and Kentucky would put it on bituminous.

The Dauphin County Court of Pennsylvania has decided that anthracite can be taxed, one of the reasons given being that anthracite can be taxed and bituminous coal be allowed to escape because anthracite is not like bituminous in that it won't make coke. But that is the irony of it all. Coke is pushing anthracite against the wall, is competing with anthracite, and the hard-coal people want help rather than hindrance in meeting this new competitor.

Telephones and Safety

READING the article on the fire in the Sunnyside mine, published in this issue, the first impression is to ask why telephones were not installed. They would have saved that three-mile run to the mine mouth to summon help, and the fire would have been more easily extinguished. The mine would have been working the following morning, and all the expense would have been saved.

However, it should be said that telephones were installed at the Sunnyside mine, which is an unusually well equipped plant and, what is more, they were used, but, not being able to reach the superintendent or foreman by telephonic means, the shotfirer who had discovered the fire made no attempt to get in touch with anyone else and started on his long trip, leaving the fire behind him.

Fighting Fire

IN A recent article by J. J. Walsh, written for *Coal Age*, on the fighting of shallow mine fires, no mention is made of silting as a means of their extinguishment. In this issue we brief some of H. J. Rahilly's remarks on the use of silt as a means of coping with mine fires, and though perhaps culm might only add fuel to the flames the use of fine sands or even clays and shales might serve the desired purpose.

Fine sands, we are told, is apt to make quicksands. This is true if time and opportunity are not given to the sand to settle. After all, the more fluid the sand the more likely it is that it will reach all parts of the flooded area. Clays are apt not to free themselves of the water by means of which they are conveyed and thus they do not form solid silting, but if the purpose is merely to fill the mined areas to the exclusion of air they may well serve the purpose desired.

By use of many churn drillholes as well as by openings through the bulkheads sealing the areas and even diamond drillholes through the surrounding walls, sufficient sand or clay could be washed in to extinguish almost any fire. An attempt to fill the mine with incombustible gas might well be futile because the flow of this gas could not be regulated to meet the needs of the places on fire. It would escape to the surface as the gases evolved by the burning coal are now doing and the cooling effect would be slight. A quantity of silt, on the other hand, would lower the temperature immediately, cause a steam pressure that would expel the air from all connected passages, and, being sent to place through many boreholes, would not fail to reach every part of the burning area. It also would assist in making it feasible to save all the coal in second mining.

Shale and culm have been found preferable material for silting live workings. They might not be so exceptionally advantageous in the filling of fire areas. In bituminous regions the shale has some value as a combustible and when dry might carry fire. In the anthracite regions the shales are barren of oil, at least all that is volatile in the natural oils has been driven off. The culm, however, has much carbon in it. For this reason shales might be used for fire silting, though culm is not so well suited to that purpose.

The matter is worth the trying, for whatever is done in the way of silting can do no harm, except perhaps in some very shallow fires, where possibly an outburst of steam or an explosion of water gas might result.

Recrudescence of a Rosicrucian

HOW fortunate for the United States that on the eve of a suspension of coal mining Herr Prückner, a chemist of Munich, has announced his discovery of a method of making coal from common rocks! The *New York Times* published a news story bearing the Berlin date line of March 6 conveying this important news to a waiting world. We must urge our Patent Office to early action, for it is stated that the Herr Doktor—he is a medical student, it seems—is "naturally reticent about the matter until his discovery has been fully protected legally in all countries, for the new coal, it is asserted, can be made by a comparatively simple process almost anywhere in the world."

"As science knows," he told a correspondent, "stones with some coal content are to be found in our mountains in vast quantities. I studied these stones and finally chose two sorts with about 30 per cent of coal ingredient and set to work to see if I could increase the percentage of coal in them. I pulverized quantities of them and added certain chemicals to the powder. I applied heat in various degrees and allowed the mass to cool by certain stages.

"Soon I saw that the percentage of coal in the baked mass had perceptibly increased. The coal was present in the midst of a gray or gray-yellow coating.

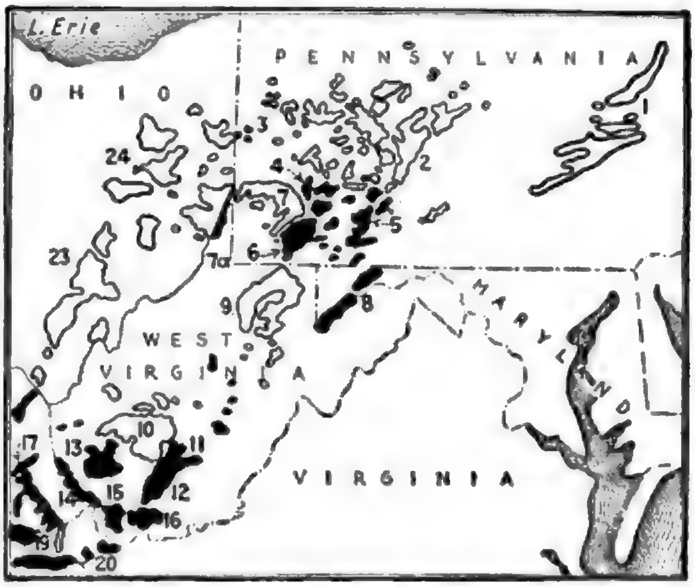
"Later I found that for the reduction of the coating a certain chemical admixture was very effective, and then I discovered that the addition of another powdered mineral caused the crust almost to disappear. At that stage the finished mass contained 56 per cent of coal.

"It was when I was obtaining a product with that percentage of coal content that I made a surprising discovery. It was that at a certain stage of the process the coal ingredient rapidly increased from 56 to 72 per cent. Since then the percentage of coal has been increased until now I can say that what I produce is coal of excellent quality.

"Its production is technically simple. The minerals required are everywhere plentiful, and the cost of production is surprisingly low. I have worked it out at 25 marks a hundredweight—that is, for coal with the heating power of anthracite."

This is now a nation of amateur alchemists. Home-brew apparatus should readily lend itself to the making of coal from cobblestones by a process so simple as that described—or has it been described as yet? The cabled dispatch to the *Times*—how thoughtful not to trust so important a message to the slowness of the mails—says that the correspondent who was privileged to visit the laboratory and view the samples of synthetic coal, found that they were actually black, in fact a deep black. The new coal also is an improvement over our crude variety in that the gas it gives off has no "obnoxious smell."

What hope has the miners' union in a strike, when soon every man can have his own coal supply?



CORRECTION.—The map of the coal fields in the supplement to *Coal Age*, March 18, showed the Pennsylvania anthracite fields in solid black, the symbol reserved for non-union and open-shop districts. This was an error. Everyone knows the anthracite region is unionized.

Cut out the map above and paste over the corresponding portion of the original.

Apparatus Men Load Out Heated Material from a Mine Fire in a Cooling Current of Oxygen-Depleted Air*

Over Fifty Apparatus Men Work Six Months Reopening Sunnyside Mine, Utah—Water from Hose Cools Rock Inefficiently and Makes Too Much Steam—Air of Low Oxygen Percentage Is Used in Its place

By C. A. Allen† and A. C. Watts‡

IN THE No. 3 Sunnyside mine of the Utah Fuel Co. a disastrous fire started in the afternoon of Aug. 17, 1920, the effects of which are still present in the mine. The operation, which is located in Carbon County, Utah, normally produces about 1,300 tons of coal a day. Two seams of coking coal lie on a pitch of about 5 deg.; the lower seam, in which the fire occurred, is 10 to 12 ft. thick and is overlaid with 5 to 7 ft. of shaly sandstone, above which is another seam 5 to 5½ ft. thick. The mine is non-gaseous, and the active workings consist of a drift about 8,000 ft. long which intersects (approximately half way down) a slope a mile long.

The workings on the slope above the point where the haulage drift intersects it are called the raise workings, and those below dip workings. Entries are driven off the slope on the strike of the coal, and the mine is operated by straight room-and-pillar methods. It is ventilated with a suction fan and, in addition to the opening where the fan is located, there were intake openings at two points, one north of the fan at the main haulage portal and the other near the extreme south end of the mine. Practically speaking, no workings in the upper seam were reached by the fire, although it spread to the upper coal where that seam was exposed by caving.

In reopening the mine after the first seal was broken between fifty and sixty apparatus men, working three shifts daily, were constantly employed for more than six months, from Sept. 28, 1920, until April 9, 1921.

It required twenty-four days for these crews to advance the fresh air to the seat of the fire, and this part of the work called for the construction of forty-six doors and stoppings, in many of which it was necessary to do much shoveling in order to get into the solid material.

In all, more than 10,507 periods of apparatus work were performed, in which were used 13,533 regenerator cans and approximately 210,000 cu.ft. of oxygen. (A period under apparatus consisted of four hours, the men actually working about two hours on an average.)

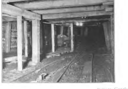
In the course of the recovery of the mine 3,835 ft. of slope and entry were cleaned out, from which more than eight thousand 40-cu.ft. cars of caved coal and rock were removed. Approximately 5,500 cars were loaded out by men working with apparatus.

The largest cave may be estimated as 30 ft. high and

FIG. 1

Timber in Big Cave

Timber sets had to be erected to support the roof above the main fall, which was 18 ft. wide and 20 ft. high. Not only was this timber erected by the apparatus men, but the fall was removed by the same men working in an oxygen-depleted atmosphere. This cut fully illustrates the heavy work that can be done by men cumbered by breathing equipment in an atmosphere by no means cool. They worked in all 10,507 periods. The Anaconda Copper Mining Co. last year changed its apparatus no less than 22,851 times, probably a record for such work.



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*Reprint of abstract of report of fire in No. 3 Sunnyside mine of Utah Fuel Co., published under title: "Fighting a Mine Fire with Its Own Gases," in Reports of Investigations, Bureau of Mines, February, 1922.

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30 ft. wide, but this statement would overlook the fact that the cave extended into the entry, which branched off at this point, making the fall much larger. In cleaning out this fall forty cars of material had to be removed for each foot of advance.

The most remote point reached by the fire was more than 1,500 ft. from the point of origin. Despite the difficulties to be met not a single apparatus man was killed in the recovery of the mine, the most serious accident being the loss of a left arm. More than 600 gas samples were taken and analyzed at the mine in an Orsat apparatus and, in addition, many were sent to the Pittsburgh laboratories of the U. S. Bureau of Mines for analysis.

Finds Timber Crib and Top Coal on Fire

The mine is wired so that all shots may be fired by electricity from the surface, and at about 5:15 p.m. on the afternoon of Aug. 17, when the shotfirer reached the main slope and the first left main entry in his rounds to close the room switches, he discovered a fire which was burning a timber crib and also the top coal. The parting of the first left entry leaves the slope at the point where the main haulageway intersects it, and it was customary for the men to gather there while waiting for the man trip. The shotfirer discovered the fire about forty-five minutes after the trip had left, and the assumption is that either a miner's carbide lamp was left burning against a timber or (and this is a more probable supposition) that an electrical short-circuit started the fire. Throughout the mine 500-volt direct current was used.

After locating the fire and making ineffectual attempts to extinguish it, the shotfirer went to the tipple, a distance of nearly three miles, to get help. In the meantime the fire short-circuited the power wires, so that the superintendent and foreman had to walk in, arriving just before seven o'clock.

When the mine officials reached the fire the draft was causing it to travel rapidly up the main slope, also into the first left entry and up the back slope. They short-circuited the ventilation, but this caused the smoke to roll in all directions and forced them to restore the air current, but in a much reduced volume. The fire was then fought with hose for approximately thirty-six hours, when explosions, caused from the products of combustion, made it necessary to abandon these efforts.

Explosions Compel the Sealing of the Mine

A brattice cloth had been placed to keep the smoke from eddying around onto the men who were holding the hose, and the first tendency of the gases to explode was indicated by the action against this brattice cloth. This gave warning of the heavier flares or explosions which followed. In consequence the men were withdrawn in time to avoid serious consequences. When the efforts to fight the fire with the hose were given up, the mine was sealed at the portals. This required six seals at three different locations, and they were not completed until Friday night, Aug. 20, during which time the air, of course, had free access to the fire.

The seals at the mine portals confined almost 540 acres of workings, in which, it was estimated, there were almost one hundred million cubic feet of air. It was decided to keep the mine sealed until all active combustion and flames were subdued and until the mine air had become so depleted in oxygen that explosions would be impossible.

While the mine was sealed daily samples of the mine air were taken from the stoppings, and three weeks after sealing was completed, the monoxide had been so reduced in percentage that it could not be detected by Orsat apparatus. The oxygen content also had been reduced to about 5 per cent. The oxygen content continued to diminish until on Sept. 28, 1920, or thirty-nine days after sealing, the first seal, which was near the fan opening, was broken in the reopening of the mine.

On Sept. 28 the gas in this part of the mine was found to analyze as in Table I.

TABLE I. ANALYSIS IN NO. 24 ROOM 200 FT. FROM THE OUTSIDE

Bottle No.	CO_2 Per Cent	O_2 Per Cent	CO Per Cent	CH_4 Per Cent	N. Per Cent	Temperature
258	4.65	0.66	0.05	0.89	93.[illegible]	59°
259	4.69	0.67	0.06	0.89	93.[illegible]	

These are among the lowest oxygen percentages found during the entire fire. The depletion of oxygen was supposedly due in part to its absorption by the coal as well as to its combustion by the fire. The gas was perfectly clear, and the almost entire absence of carbon monoxide was an advantage. The distance from this point to the fire was approximately 4,000 ft., and a large force of apparatus men advanced the fresh air in stages of 400 to 800 ft. The main body of the gas was sealed off by stoppings as the work proceeded, and on Oct. 21 the fresh air had been advanced to the seat of the fire, being kept away from it, however, by a strong, tight bulkhead.

Confined Gas Has Heavy Breathing Action

When samples were being taken through the seals and also when the fresh air was being advanced into the gas-filled mine the expansion and contraction, or so-called "breathing action," of the confined gas (depleted air) was marked. It was sometimes impossible to get good samples through the seals when the pressure was inward, due to the gas being contracted, and when the fresh air was being advanced, although double doors were always used, it would sometimes be possible to carry a flame safety lamp several hundred feet inside of the fresh-air base.

Also, when the pressure was outward, due to the gas body expanding, it would be impossible to take a safety lamp up to the doors. This "breathing" was, of course, due to the changes in barometric pressure, and it was found that normally there are four times during the day when the barometer changes. It usually rises in this district from one o'clock in the morning until ten o'clock, then falls until five or six o'clock in the afternoon, then rises again until some time before midnight; then there is a short period of falling barometer until about one o'clock in the morning.

When the barometer is rising the fresh air will go in and when it is falling the gas will come out. However, frequently the periodic or atmospheric fluctuations in the barometer overcome the normal daily fluctuations, so that the change may come at any period of the day. The most marked *normal* change comes about ten or eleven o'clock in the morning. Before that time the pressure is inward and thereafter it is outward. This was the most constant feature and the one least liable to be changed by periodic fluctuations. The maximum change in barometer observed over a long period was equivalent to about 9 in. of water gage, whereas daily changes equivalent to 2 in. or more of water gage were not uncommon.

The difference between the temperature of the gas and that of fresh air also has some effect on the movement of the gas. When cold air enters through any leaks in the stoppings or through the doors at a fresh-air base and comes in contact with warm gas, the latter is cooled and contracts, which augments the effect of rising barometric pressure and further increases the tendency of the fresh air to be drawn in.

For this reason it was found practically impossible to approach within several hundred feet of the hot caves without raising the percentage of oxygen in the gas or depleted air surrounding them. In fact, in this case explorations to the point of origin of the fire, when the fresh-air base was 1,600 ft. away, disclosed the fact that the hot caved material was absolutely dormant and surrounded by gas containing 2.41 per cent oxygen, 3.86 per cent carbon dioxide, no monoxide, and 0.66 per cent methane.

By the time the fresh-air base had been advanced to within 400 ft. of the hot material, however, the oxygen content in the gas surrounding it had increased sufficiently to make the hot coal give off much smoke, and on one occasion enough fresh air passed through the double doors to the hot material to cause a blaze. The entrance of the fresh air past the double or air-lock doors was due almost entirely to the daily contractions of the confined body of gas or depleted air, but because the hot material was on a slope and was being approached from the lowest point, there was a furnace action caused by the heat, which tended to draw up the slope not only the foul air immediately surrounding but also the fresh air from behind the nearby doors.

ONLY TWO ENTRIES FILLED WITH FRESH AIR

The foregoing remarks refer particularly to the actions of the gas observed as the fresh air was being advanced toward the fire. It must be remembered that the fire was in the heart of the mine and the entire mine had been sealed. In advancing the fresh air only one pair of parallel entries was used, one being the intake and the other the return, and the workings surrounding these entries were filled with the residual gas or oxygen-depleted mine air. The entries which were used approached the fire from the north end of the mine, while the single opening through to the outcrop at the south end of the mine was kept sealed, but, due to the fractured nature of the rock, the seal was not absolutely airtight.

The fan, as before stated, was a suction fan with a water gage of 1½ in., which meant that on the fresh-air side of all the stoppings, built to hold in the gas at the north end, there was a pressure less than atmospheric. These stoppings were also nearly, but not absolutely, gastight. Also the doors at the fresh air bases were constantly being opened and closed by apparatus men as they entered the gas to build new stoppings. It would be assumed that the lower pressure outside of the stoppings at the north end would at least partly overcome the tendency for fresh air to flow into the gas area when the gas was contracted, due to changes in barometer.

While the effect of the pull of the fan could not be detected on the daily recessions and advances of the gas, after a long period of time it was found that it had made some difference because the fresh air worked in through the imperfect seal at the south end for a considerable distance.

When the fresh air had been advanced to a point adjacent to the hot caves left by the fire, great care was used in the construction of a stopping to keep the air from actually getting to the hot material, but after some preliminary work had been done (including a 200-foot crosscut to get above the big cave) and a number of explorations made, it was decided to make an attempt to load out the hot caves with men not cumbered with apparatus, which meant allowing the fresh air to get to them. Before starting, however, a system of bulkheads and stoppings was so constructed that at any time the fresh air could be excluded from the hot caves and the gas (depleted air) conducted to them. The one hundred million cubic feet of this gas which had accumulated in the mine as a result of the sealing of the fire was practically all held on the assumption that it might be needed as an aid in overcoming what was left of the fire.

COAL WAS SO HOT THAT IT IGNITED IN AIR

Two attempts were made to use fresh air, but both were unsuccessful. These efforts were concentrated on the big cave on the main slope near where the fire originated, and in places this cave was 30 ft. wide and 30 ft. high. The first attempt was made at the down slope end, but the fresh air was drawn through the hot material, causing it to re-ignite. When this oc-

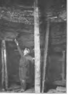

FIG. 2. ON TOP OF TIMBERING SHOWN IN FIG. 1

Shows the upper crust of coal and the rock caved above it. Here the apparatus men placed temporary posts which were replaced later by timber sets of more permanent character.

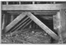

FIG. 2. TIMBERING ON TOP OF THAT IN FIG. 1

This is the permanent timbering placed by men working in fresh air on the top of the timbering erected by men breathing through apparatus.

curred the fresh air was excluded and the gas (depleted air) conducted to the flaming material. This immediately extinguished the flames.

The next attempt was made on the up-slope end of the big cave, as it was believed that the fresh air would not work down the slope into the hot material. This proved to be a mistaken assumption, however, for the fresh air did work down into the hot material, because the contraction of the main gas body more than overcame the draft which the heat caused to travel up the slope.

If it had been possible to surround the big cave with bulkheads the fresh-air attempts would no doubt have been successful, but, unfortunately, the big cave connected with other caves which led back into the south part of the mine, where the main body of depleted air was impounded. The caved material was so porous that when the barometric pressure started to increase and force the main gas body to contract, fresh air was drawn into the hot caved material.

WATER FROM HOSE MAKES MUCH STEAM

Some of the conditions observed during these attempts to work with fresh air were as follows:

First: It was impossible to get over the top of the cave, but water, through hose, was played on both exposed ends. It proved to have practically no effect. Experience showed that water is of little use on a large cave unless the material can be flooded. It is true that water from a hose will cool what hot material can be reached directly, but even then it causes so much steam that the men cannot work in it, and it greatly increases the sloughing from hot ribs and roof, with the consequent dangers from falling pieces.

Second: The fresh air leaking, or circulating, to a certain extent through the hot caves fed the smoldering fire, distilling inflammable gases from the coal. One sample of gas was taken which contained about 3.5 per cent carbon dioxide, 8.8 per cent oxygen, 2.2 per cent carbon monoxide, 5.4 per cent methane, 4.3 per cent hydrogen and 0.6 per cent ethylene (C_2H_4).

Third: Depleted mine air is the most effective weapon in fighting a fire, especially in a pitching bed where the air can be easily controlled. In this case the gas (containing a little less than 5 per cent oxygen and about 4 per cent carbon dioxide, with a temperature of about 64 deg.) stopped all blazing immediately, and where the cave was porous enough to permit good circulation it had a marked cooling effect; in fact, the efficiency and easy control of the foul air was so marked that it was used in all the subsequent work and can be considered as the controlling factor in successfully overcoming the fire.

After it was found that fresh air could not be used, the possibility of flooding the entire area was considered. It was decided, however, that flooding was not practicable, due to the various directions in which the fire had spread, the number of bulkheads required, and the difficulty of placing them around it. Careful thought also was given to the possibility of leaving the fire sealed until there would be no possibility of fresh air re-igniting it. It was feared, however, that this would take too long a time (which later developments proved would have been the case), so the only recourse left was to load the hot material out with apparatus men working in the depleted air, which was so controlled that it would be conveyed to any point of operation.

It was found that by having the apparatus men shovel from the down-slope end of the hot caves the men could always be kept cool enough for effective work if the caves were sufficiently open to draw the gas through them. Sometimes work could be carried on from the upper end. This was when there was sufficient draft to keep the hot gas traveling over the men's heads against the roof. The cool gas would travel down the slope along the floor to the face of the hot cave, where it would become heated, rise to the roof and travel back up the slope over the heads of the shovelers.

One portion of the fire area caved so tightly that it was found impossible to maintain a circulation that would carry the hot gas away, and the men worked for some time in very high temperatures, some reaching 176 deg. The hottest places would always be against the roof, and when a blower fan was tried it stirred up the gas, causing the hotter part near the roof to be whirled down onto the men, making matters worse. On the other hand, when there was a good draft a stream of cool gas from a blower fan at the men's backs was very effective.

APPARATUS MEN CAN ENDURE GREAT DRY HEAT

From actual experiments made, using a standard thermometer, it was found that apparatus men could remain for several minutes in temperatures of 190 deg. and could stay for at least one minute in temperatures exceeding 220 deg. When men entered these temperatures they were always perspiring profusely, and undoubtedly the film of perspiration protected the skin. At any temperature above 170 deg. if any of the men touched any metal part of his apparatus his skin was blistered, and as soon as the machine commenced to get heated through the discomfort of breathing increased rapidly. It should be remembered that the men were always wearing apparatus in these temperatures and the gas was dry. At one time, when hose were being used, 115 deg. to 125 deg. of steam-saturated air was found to be almost unbearable to men wearing apparatus. Also, we recall another mine where a temperature of 175 deg. of an almost saturated atmosphere proved absolutely unbearable to the flesh.

From careful observations made during the course of fire-fighting operations it was determined that the hot caves would not be re-ignited, but, on the other hand, the heat would be lowered by gas (depleted air) containing 5 or 6 per cent oxygen and about 4 or 5

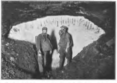

FIG. 4

Stopping in Old Crosscut

The crosscut is closed by a plaster-ed board stopping. The plaster used was hard wall cement and wood pulp. The illustration gives a good idea of the quantity of material that often had to be removed before rock and coal solid enough for a stopping could be reached. Note the soot on the roof.

per cent carbon dioxide. There is no doubt that some oxidation will continue in hot caves of coal as long as there is any oxygen in the air reaching them, but where the oxygen falls below 5 or 6 per cent and there is circulation, oxidation is not noticeable and is more than counterbalanced by the cooling action of the depleted air. When the percentage of oxygen rose to 7 or 8 per cent, oxidation would be more rapid, the fire would be brightened, the temperature would rise, smoke would increase, inflammable gases would be formed, and increased percentages of carbon dioxide would be found.

One branch of the fire burned up an abandoned and caved room on the first left main entry. As this was an abandoned part of the mine, it was left sealed off and is still under seal at the present writing. Access, however, was at all times provided to the down-dip end of the hot material, and temperatures were constantly taken. From the results of the temperature readings and the gas analyses it can be almost positively stated that this part of the cave has been hot enough to ignite with air up until the present time, which is fourteen months after the fire started.

MINE WOULD HAVE TAKEN OVER YEAR TO COOL

This particular place was never reached with any fresh air during the fire-fighting operations, so it can be inferred that it would have been necessary to keep the entire mine sealed for an equivalent time before air could have been admitted. The oxygen content in this room has gradually dropped to less than 1 per cent, and the carbon dioxide content increased to 10 per cent.

Before the mine was reopened after being sealed, a careful organization was worked out. It proved to be efficient and smooth working, there being no confusion at any time. A doctor also was kept at the mine day and night for several weeks. Two expert repairmen went over each apparatus (Paul apparatus were used) every time it came out of the gas, which proved to be an important safety measure. Most of the work was done within 500 ft. of fresh air, and when carbon monoxide was present in the mine gas only short exploration trips were permitted; never more than 1,500 ft. and usually much less.

Even when no carbon monoxide was present the exploration trips were seldom more than 1,500 ft., although one trip of 2,300 ft. one way was allowed where absolutely no obstructions interfered with travel. This trip was made in an atmosphere containing about 6 per cent of oxygen with no poisonous gases. On long trips extra apparatus were carried, and a stretcher always was taken.

Although it is not believed that any unsafe trip was allowed, it should be borne in mind that this gas was being sampled daily and sometimes several times each day, and the apparatus men knew exactly what it contained and how to proceed in case of trouble with any apparatus. We are of the opinion that it is frequently foolhardy to take trips of 1,500 ft. in an atmosphere containing carbon monoxide and much more dangerous than taking a 2,300-ft. trip in an atmosphere free from it.

AT ABOUT 50 ILLINOIS shipping mines, producing approximately one-half of the state's total output, 500 tons (10 of the largest railroad cars) of coal, must be loaded each hour of the working day into pit cars, hauled a mile or more to the shaft, hoisted, screened and otherwise prepared and loaded into a railroad car for shipment to consumers. The man and mechanical power used at such a mine in a single week would prepare the land, plant, cultivate and harvest the crop from the entire overlying 2,500 surface acres of such a mine, and still have enough man power and mechanical energy left to carry the entire harvest to final market. The total investment in such a coal mine also would be from three to four times the value of the overlying 2,500 acres fully improved and used for agricultural purposes, estimating such land to be worth as much as $150 per acre.

AN INVESTIGATION OF CAUSES of death among bituminous coal miners will be undertaken by the U. S. Bureau of Mines to obtain, if possible, the principal hazards connected with this industry, in order to better avert them.

Coal Analyses May Be Misleading Because of Crude and Insufficient Sampling[*]

Small Quantity Carefully Selected May Yield Impressive Figures, but Will Scarcely Be Representative of Shipments—To Be of Value to Purchaser, Average of Numerous Samples Taken Over Long Period Must Be Indicated

BY O. P. HOOD[†]

Exclusive to Coal Age

TO OBTAIN a clear understanding of the part analysis may play in the purchase of coal let us follow the thought of analysis as it is presented for the first time to a purchasing agent. A short time ago I received a letter from a coal operator, carrying on the letter head an analysis of, let us say, Black Sambo coal, mined from No. 4 seam, Utopia, State of New Hope. It reads:

Moisture	1.46
Volatile	19.74
Fixed carbon	76.10
Ash	2.7
	100.
Sulphur	.808
B.t.u.	15,177

The first innocent question is, "What is this an analysis of?" This may prove to be a delicate question. The inference one is expected to draw is that it is an analysis of a product that one can buy. But is it? This may be the analysis of a single sample taken in the mine at the face by a skillful mining engineer intent on advising his company as to the quality of the coal as it lies in the ground. If so, another engineer following the same method can go back to the same spot in the mine and get another sample that will check quite closely to this one. But the coal may vary from place to place in the mine, and an average of many samples taken throughout the mine would obviously be a much safer guide. These face samples represent the ideal product that could be produced from the mine with miners always selecting coal as did the original sampler.

HOW ANALYSIS INTERESTS THE PURCHASER

The buyer is interested not in what is in the ground but what gets into the car shipment, so that this suggests an entirely different kind of sampling. The analysis quoted may, therefore, be a tipple sample taken to represent a carload, a day's run, a cargo shipment, a week or a month's production, or an average of many delivered samples extending over a period of time, and representing a very large tonnage of coal actually delivered. It is obvious that the value of the analysis grows as it represents a larger and larger quantity of delivered coal. Some of the best operators have a sample properly taken of each day's output as it goes into the cars. The ash content is determined for each day, and these figures are plotted on a monthly report as a curve from which it usually is possible to indicate holidays and pay days from the rise in the ash curve. The quality from a given mine varies through a certain range, depending upon many mining conditions and the state of the market. The analysis of interest to the purchaser would, therefore, be an average of a large number of samples representing a considerable quantity of delivered coal extending over a considerable period of time. He would be interested, also, in analyses showing the probable variation to be expected in delivered coal from the particular mine in question.

Specific information of this sort is exceedingly rare, in spite of the great amount of coal analyses that have been made. It so happens that the Bureau of Mines has many analyses of delivered coal from the seam referred to. In making a comparison with these published records the analysis seems quite normal, except in the matter of ash. This coal comes from a very low-ash field, and analyses as low as that of 2.7 per cent ash have been recorded, but the average from 36 mines shows ash, 5.9 per cent, with the lowest 4.22 per cent and the highest over 12 per cent, and two deliveries from the very mine referred to ran 5.9 per cent and 6.9 per cent, instead of the 2.7 per cent quoted. From this it would appear that the analysis in question was not representative of quantity production at least, but probably of a selected sample or a mine sample.

WHAT DOES THE ANALYSIS REPRESENT?

An analysis is of little value unless you know what it represents. There are many published analyses useful to the geologist and the student of coal measures that must be used with great caution in commercial deliveries. The wrong use of analyses has led to disappointment and to an unjust condemnation of buying on analysis. The sample, therefore, should be of delivered coal, and should be so taken as to be representative. To obtain a representative sample is found in practice to be far from simple. The art of sampling is highly developed in the buying of metalliferous ores. It is perfectly obvious that in buying a carload of gold or silver ore much depends upon the method of sampling. Iron ore is all carefully sampled and priced according to analysis.

Coal is frequently worth more per ton than either gold or iron ore, and the same refinements in principle must be observed in sampling coal as in other sampling. A standardized method of coal sampling has, therefore, been adopted, and must be followed to obtain a just sample. It is worse than useless to make an analysis of an unfair sample. Much of the complaint about buying on an analysis basis hinges on this matter of sampling. The analysis method should not be used unless one is prepared to undertake righteous sampling. During the war an official complaint was made concerning American coal received at a certain foreign port. A foreign fuel-testing laboratory reported over 30 per cent ash. Such a charge against American coal seemed serious, and the Bureau of Mines sent a man to Europe to follow the coal from its landing to the hands of the consumer. Observations were made of the method of sampling. A young man with a small handbag, or valise, went on board the boat, selected several handfuls from various parts of the coal that he could get at, until not over 10 lb. had been selected. This formed the gross sample to represent the cargo. It was so manifestly unfair and inadequate that the whole report was discredited. An analysis of such a sample was worse than useless.

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[*] Based on an address to the New York chapter, National Association of Purchasing Agents, Feb. 21. Second and concluding installment. The first part appeared last week.

[†] Chief mechanical engineer, U. S. Bureau of Mines.

A study of the theory of sampling soon shows that a relatively large gross sample—1,000 to 2,000 lb.—is necessary, and that there should be crushing facilities to reduce the size of particles. This immediately shows that proper sampling means much hard work unless mechanical devices are available. Furthermore, a cargo should be represented by several such samples taken in equal small increments throughout the whole period of unloading. Without special mechanical devices it is practically impossible to take a fair sample except as coal is being moved from one container to another. Settlements based on haphazard sampling are apt to be unjust, unless many samples are involved.

Two organizations were sampling coal as it was loaded for foreign shipment. Both sets of samples were analyzed in the same laboratory. One organization was believed to be unskillful in its method of sampling, and some thousands of analyses representing more than half a million tons in each set were compared. The average heating value of the two sets checked within two B.t.u. in a total of over 14,500, but the range in variation of ash and moisture was twice as great in the one set as in the other. This shows that while great reliance can be placed upon averages of many determinations, one must not expect an undue degree of accuracy in any one determination, especially if the greatest skill is not brought to bear on the work.

INFLUENCE OF LABORATORY METHODS

Examining again the typical analysis carried on the letterhead of the coal company, one notes that six items are given. If this is of a single selected sample, as we have reason to think, how close to the facts is the moisture determination, say, which is quoted as 1.46 per cent? This particular coal belongs to a type having a very small amount of inherent moisture. If it had been a Midwest coal the moisture would have been between 8 and 17 per cent. In any event, a change in laboratory method might have changed the figure 10 or 15 per cent of itself either way. The volatile matter is reported as 19.79 per cent. Failure to rigidly observe the same standard methods of heat treatment in different laboratories may result in deviations of 2 or 3 per cent in the amount of volatile matter and fixed carbon reported in the same sample of coal.

The ash determination is similarly affected by method and computation corrections. The heating value determination may vary 50 to 100 B.t.u. in duplicate determinations. The point I wish to convey is that while there is a satisfactory and reasonable commercial accuracy in analytical work of this kind, it is not the same degree of accuracy that we expect in a multiplication table or a table of income yield at certain interest rates. The figures must be used with a knowledge of their limitations in order that justice may be done, and no hair-splitting arguments or settlements should be based on small variations in the figures. Fortunately, the value of analysis as a guide to rational buying does not depend upon small decimal differences.

A coal dealer anxious to sell to the Government Fuel Yard represented his coal as having not over 8 per cent ash, and desired to send a sample carload. The ash ran 16 per cent. Anthracite No. 3 buckwheat had been obtained for many years running about 16 per cent ash. The ash increased during war time to above 22 per cent. A proposition to abandon the use of anthracite and put in fuel oil brought the ash down again to about 16 per cent. The possession of records of actual quality from year to year made a perfectly definite statement of the case possible. Such work does not depend upon hair-splitting fractions, but does depend upon good sampling and many analyses. If one is to use analyses in buying coal, the number of samples and analyses should be liberal and the work should be well done, or not begun. This brings one to the question of cost of such work.

In general, it costs too much for national introduction, except where the work can be systematized and applied to a considerable tonnage. There is no question as to the advantages for the large consumer of coal, but the practice of the relatively few large consumers has little bearing on the general fuel problem as represented by the multitude of buyers of coal. The very large buyers of coal are amply able to take care of themselves in this matter, but the great complaint of the public about coal quality comes from the multitude of moderate and small buyers who individually cannot use analysis in buying coal, but who nevertheless form public opinion about the coal business, and threaten to interest themselves in the conduct of the business.

PRODUCER SHOULD CLEARLY DEFINE PRODUCT

Many forces urge various legislation, either local, state or national, that gives expression to discontent with quality, price or service, but which would be inoperative if attempted. Eminent opinion has it that the coal business functions poorly. If evolution into a better order of things is to proceed it seems to me that one of the first essentials is to provide satisfactory conditions for intelligent and satisfactory bargain and sale. There must be means for more clearly defining what the producer has for sale, means whereby the buyer can more readily match his needs against the offered article, and means for determining whether the material delivered is as represented. Whenever a commodity of lower value receives a higher price than it should there is an economic waste, and also when a product of higher value is forced to accept by competition a less price than its worth there is economic loss. This all leads back to adequate sampling and analysis as the element in the problem capable of numerical expression and having in general the closest relation to practical inherent values.

I believe a time will come when it will be recognized by both producer and consumer that some system of inspection and grading of coal will be of mutual advantage. It has been declared that coal is a matter of public interest. The system of inspection should be national, the same as the grading of other primary products such as wheat, cotton, meat, etc. Some of the principles of the pure food law also apply in that the thing presented for sale should be what it purports to be.

The Bureau of Mines has for some time past given consideration to the matter of coal classification. American coals are of such great variety and pass from one grade to another by such small differences in chemical, physical and other useful qualities that classification must use more or less arbitrary dividing lines. Preceding general coal classification there must be a method and mechanism for accurate and satisfactory sampling of coal as delivered in order to place the coal in the proper class. It is obvious that a sample must be thoroughly representative of the whole shipment of coal under consideration, else injustice and dissatisfaction will follow. This sampling and analysis of coal has been the subject of study and practice by the bureau for more than ten years past, and methods have been devised which have proved satisfactory to many purchasers and operators. It is believed that an application of these methods on a comprehensive national scale is possible.

Secretary Lane proposed three years ago a bill based upon this experience of the Bureau of Mines and upon the belief that while the expense of operation should be borne by the industry, the mechanism for inspection and analysis should be in the hands of the government, since it had become apparent during the war that such mechanism was sorely needed as a national protection in time of stress.

A method which the Bureau of Mines believes is practical is to establish coal-sampling stations at railway gateways or other convenient locations where representative samples can be taken when desired of the coal shipped. The analysis of this coal, accurately determined and supplied to the operator, will enable him to declare a standard for his coal which, because of the particular bed, mining methods, means for preparation and class of custom, he knows that he can maintain. This standard being published by the government, gives accurate information to the buyer of what he can expect from that mine. The inspection service would discover whether shipments of coal were being maintained within the declared standard. This information would be given to the operator and the public, and the operator would be allowed to advertise that his mine produced coal whose quality was certified by the government. If shipments became sub-standard this privilege would be withdrawn and the operator required to declare a new standard which he could maintain or forego the advantage of government certification of quality.

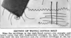
The certification of quality by the government is of value to the operator because of confidence inspired in the purchaser and for protection from unjust charges concerning dirty coal which result from practices of other shippers. The certification of quality by the government is of value to the purchaser in giving him reasonable assurance of uniform quality of coal.

With suitable means for sampling commercial shipments and means for determining coal quality that can be expressed in figures, the first essential of coal classification and control of quality will be available. When attempted in a large way as an engineering problem comparable in importance with efficient loading, transporting and unloading devices, fuel sampling in transit and analysis can be brought down in price to something like $1.50 per sample. When a buyer has a specification of what he can expect, and means are provided for determining whether he gets what he pays for, there will soon be available a satisfactory basis for commercial classification of coal which it is believed will largely take care of itself. Purchasing coal under such a system would be greatly simplified.

Woven Cotton Belt Has Great Flexibility

AWAY back in the early part of the age of savagery, man, finding his own hide inadequate for comfortable protection from the elements, proceeded to cover his body with the skins of animals. With the lapse of time and the accumulation of knowledge, he has gradually discarded this primitive body covering until today about the only remnants of skin clothing remaining in habitual use are the waist belt and the shoe. The reason for this evolution is apparent—something better, lighter, warmer and more pliable may be made from cotton or wool.

In like manner when man began to use forces greater than either his own or those afforded by the muscles of his domestic animals, when he learned to utilize the energy of falling water and began to experiment with the possibilities of steam, he used leather for transferring power from one revolving shaft to another.



SECTION OF WOVEN COTTON BELT

Note the ravellings in the right-hand corner—the straight and heavy cords that give longitudinal strength, the light cross fibers that hold the belt sideways and the crooked ravellings at the top and bottom which have acquired their present condition by having been weaved back and forth through the belt at right angles to the plane of its surface. Though it is a sturdy belt, it is thick, yet readily flexible.

And even to this day the leather belt forms one of the most common and best-known means of transmitting mechanical energy.

One of the greatest shortcomings of the leather belt is the fact that to assure even a reasonably long life and good running, the ratio of the pulley diameter to the thickness of the belt must be large—as a rule at least thirty and preferably forty or more. If a large ratio is not maintained the fibers on one side of the belt are unduly stretched in rounding the pulley, while those on the other are unduly compressed.

To provide a belt of comparatively extreme flexibility, to surmount the shortcomings of skins for belting as they have been overcome for clothing, the Buckner Process Co., of Worcester, Mass., is now manufacturing a belt woven from heavy cotton yarn that has been impregnated with lubricant. The weave of this belt differs radically from that ordinarily employed, the belt being composed of three sets of fibers or yarns running in three directions at right angles to each other. An idea of the appearance of the finished belt as well as of the three sets of fibers, or yarns, after unravelling from the cut edges may be gained from the above illustration. It is marketed under the trade name Lion's Paw by R. D. Skinner, 70 East 45th St., New York City.

LIQUID-CONTROLLED HOIST AT MATHER, GREENE COUNTY, PENNSYLVANIA

Liquid Controller Reduces Peak Loads by Providing for Uniform Acceleration of Large Mine Hoist

A 1,000-Hp. Motor Driving a Hoist Is Uniformly Brought Up to Speed by Means of a Liquid Rheostat—Except for the Low Hum of the Motor, Silence Reigns in the Hoist Room

BY DONALD J. BAKER
Charleston W. Va.

AMONG the interesting installations of hoisting equipment that have been made in western Pennsylvania during the last two or three years that at No. 1 mine of the Mather Collieries Co. at Mather deserves attention. This machine was designed by the Allis-Chalmers Manufacturing Co., of Milwaukee, Wis., to handle 5,000 tons per 8-hour shift from a shaft 350 ft. deep.

The mine has been laid out for a daily production of 6,000 tons, but this will be attained only when a duplicate tipple and hoisting equipment operating at a second opening, not yet sunk, has been installed. The cars, which are of 2½-ton capacity, are brought to the surface on self-dumping cages, and although the hoist used is unusually large for the Pittsburgh region the interest does not center on that fact but on the method by which the hoist is controlled.

Except for the humming sound made by the motor and drum the hoist room is silent. There is none of that clatter of closing contactors cutting out various units of resistance behind an expanse of switchboard as is heard in many hoist houses, for no switchboard is installed. The motor accelerates uniformly, and the layman can scarcely detect from appearances that the operator is bringing the drum up to speed.

A 1,000-hp. 2,200-volt reversible motor is back geared to a Vulcan hoist, the drum of which is conical, varying from 7 to 11 ft. in diameter. The control equipment, housed in a wing of the building, consists essentially of a primary reversing switch and a tank containing an electrolyte solution governing the secondary circuit. The primary of the motor is controlled through two magnetically operated reversing switches interlocked and so arranged that only one can close at a time.

For control of the secondary a steel tank with insulated lining is employed. This is divided into an upper and lower compartment, the latter being utilized as a storage and cooling chamber for the electrolyte. This liquid is nothing more than distilled water in which a certain amount of sodium carbonate has been dissolved in order to give the water the desired conductivity. In the upper compartment the electrodes, consisting of a series of plates connected to each phase of the rotor circuit, are suspended from an insulated support.

Four sets of electrodes are employed, the two end plates being connected in parallel to one of the slip rings of the motor. The two remaining sets of plates are connected with the other two slip rings. These electrodes are fashioned to special shapes so as to obtain gradual changes in resistance. They are so designed and spaced that a balanced three-phase secondary circuit is obtained.

The resistance in the rotor circuit and consequently the speed of the motor is governed by the height of the electrolyte in the upper compartment as it rises upon and finally covers the electrodes. The level of the electrolyte in this upper chamber is controlled by the operator through a system of levers by means of a multiple-shutter type of weir placed at one end of the tank. This weir embodies three or more shutters or valves connected to a common operating rod. When the hand-lever control on the operator's platform is in the off position, these shutters are all wide open. Similarly when the lever is in the full running position, the shutters are all closed, their overlapping edges being carefully machined and fitted so as to reduce leakage as far as possible.

Only one hand lever is employed in operating the controller, both forward and reverse rotation being obtained with it. The direction either forward or backward in which this lever is moved from the central or off position determines the direction of rotation of the hoist. Moving the lever forward from the central position actuates a small master switch mounted on the controller base. This closes the primary side for forward rotation of the hoist motor. A further forward movement of the hand lever gradually closes the weir in the tank, causing the level of the electrolyte to rise. This decreases the resistance offered to the passage of current and brings the motor up to speed.

Returning the lever to the central position opens the weir, which in turn lowers the level of the electrolyte, thus inserting resistance in the rotor circuit. Full resistance will be thus inserted before the operating lever reaches its central position. The movement to the off from the running position also opens the master switch, thereby permitting the primary switch to open, thus shutting off current to the motor. Movement of the lever in an opposite direction from the central position induces a similar cycle, except, of course, that the direction of hoist rotation is reversed.

CHANGE IN IMMERSION AREA VARIES RESISTANCE

Motor speed is controlled by varying the secondary resistance in the rotor circuit. This variation is obtained through the changing area of immersion of the electrodes in the electrolytic bath. A small motor-driven centrifugal pump mounted on the base of the tank keeps the electrolyte in constant circulation from the lower to the upper compartment. The upper chamber of the tank is provided with a small reservoir that retains a predetermined quantity of the solution, into which the electrodes always project a certain distance. Thus the secondary circuit is never entirely open. When the control lever is in the off position the electrolyte overflows the lip of the reservoir and returns to the lower compartment. As the controller is moved toward either running position, the primary switch closes, as already has been described. The weir shutters also begin to close, causing the electrolyte to rise, cutting out resistance and bringing the motor up to speed.

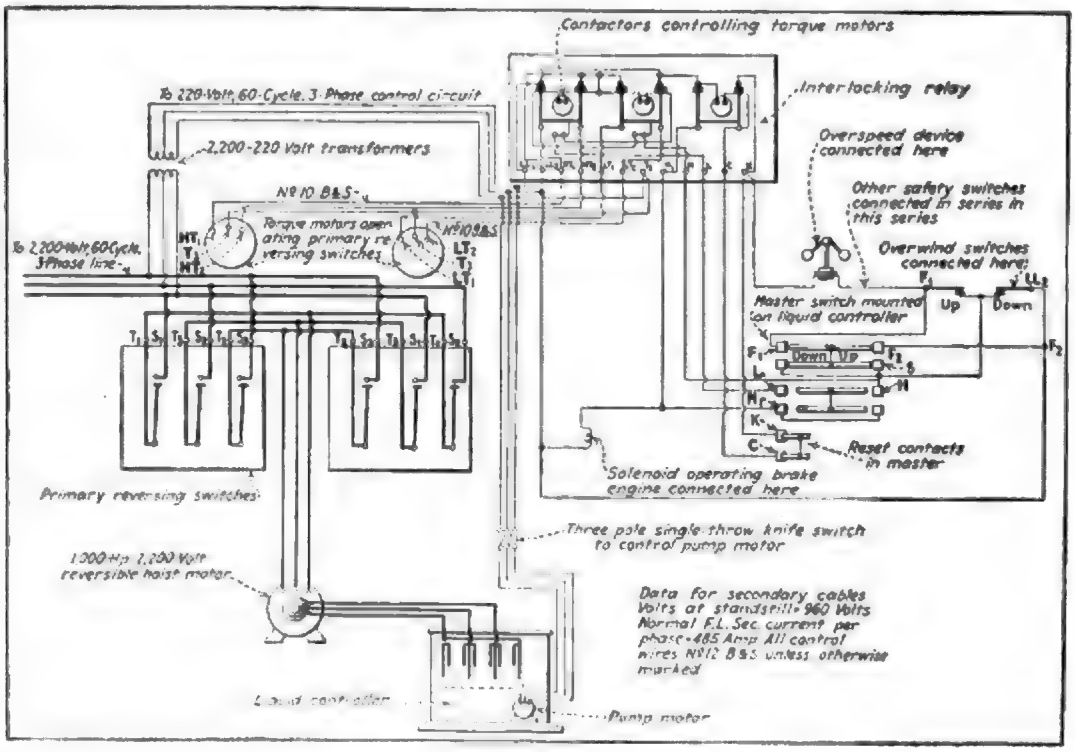
Any desired intermediate speed may be maintained by manipulating the lever controlling the width of opening of the weir shutters and consequently the depth of the electrolyte in the upper compartment and the degree of submergence of the electrodes. When the controller lever is thrown over to full running position the electrodes are completely submerged. To the upper extremities of the electrodes horizontal plates are attached, so arranged that upon their complete submergence the secondary is practically short-circuited. No other short-circuiting device need be provided. Some resistance, of course, remains in the rotor circuit because the current has still some small distance to travel through the electrolyte in passing between the short-circuiting plates. But the slip imparted to the motor on this account is limited to about 1½ per cent.

Because of the short-circuiting arrangements in the secondary circuit it is possible when lowering a heavy load to use the motor as an induction brake without any excessive overspeed resulting. In an installation of the type here described but not the one installed at Mather a trip of loaded cars is lowered down a long incline, using the motor as an induction brake, obtaining full load torque on the machine with an increase above synchronous speed of only 6 per cent.

DISCHARGE VALVE CONTROLS HOIST ACCELERATION

A control valve fitted with an adjustable segment is placed in the discharge pipe of the pump by which the electrolyte is circulated. By varying the opening of this valve the rate of acceleration of the motor may be accurately controlled. Actual tests show that the period of acceleration can be varied from about eight seconds to over two minutes. Full resistance can be inserted in the rotor circuit by the hoist driver in about two seconds. He can at once move the controller lever to full running position, whereupon the motor will come to full speed gradually and smoothly in the predetermined time as fixed by the setting of the pump valve. With the rate of acceleration governed in this manner the operator cannot in anywise damage the motor by causing it to pick up speed too rapidly.

The liquid type of controller as installed at the Mather


Contactors controlling torque motors
Interlocking relay
To 220-Volt, 60-Cycle, 3-Phase control circuit
2,200-220 Volt transformers
Nº 10 B&S
Torque motors operating primary reversing switches
Nº 10 B&S
To 2,200-Volt, 60-Cycle, 3-Phase line
HT₁
T
HT₂
LT₂
T₂
T₁
Overspeed device connected here
Other safety switches connected in series in this series
Overwind switches connected here;
F₁
LL₂
Up
Down
Master switch mounted on liquid controller
F₁
Down
Up
F₂
S
L
H
Hr
K
C
F₂
Reset contacts in master
Solenoid operating brake engine connected here
Primary reversing switches
Three pole single throw knife switch to control pump motor
1,000-Hp. 2,200-Volt reversible hoist motor
Data for secondary cables Volts at standstill = 960 Volts Normal F.L. Sec. current per phase = 485 Amp. All control wires Nº 12 B&S unless otherwise marked
Liquid controller
Pump motor

Wiring Diagram

Of hoist control at Mather Collieries No. 1 Plant. By varying the depth of the electrolyte the resistance of the secondary circuit can be made large or quite low at will. As the water rises regularly in the tank the decrease in resistance is equally regular and the acceleration of the motor is similarly steadily increased. There is no sudden inflow of current as when an ordinary contactor is brought into play. As someone has put it, the current goes up an easy ramp instead of up an oversteep stairway.

plant has many advantages. As the resistance is gradually reduced with the rise of the electrolyte, the acceleration is even and steadily progressive. This is in marked contrast to the regulation afforded by metallic controllers, where the resistance is increased not continuously but by definite steps. This is particularly objectionable in starting if slack must be taken out of the rope.

The electrodes are so designed that for purposes of shaft inspection or repair the cage may be moved at a slow speed. With controls other than those employing the liquid rheostat, special provision must be made for this duty. With the liquid controller, however, no moving or arcing contacts are present and as a result no excessive repairs are necessary. All the difficulties attendant on the arcing of parts also are entirely lacking.

The controller at the Mather shaft is compactly built and conveniently housed. No switchboard is necessary and little copper is required to make the connections. The hoist can be run at reduced speed over long periods of time without the possibility of burning out the resistance. Though the electrolyte in the upper compartment will become heated, it is cooled by a system of water coils in the lower chamber. Changes in the resistance offered by the controller easily may be made at any time to suit any special operating conditions. This is done by simply changing the "strength"—that is, the degree of concentration—of the electrolyte. In first cost also the liquid controller compares favorably with those of older type. Heretofore the chief objection to this type of control has been the fact that an excessive amount of resistance remained in the rotor circuit unless resort was made to a complicated short-circuiting device. This objection is overcome by the introduction of the short-circuiting plates above mentioned, which reduce to a negligible quantity the resistance left in the rotor circuit.

The operation of the liquid controller demonstrates the feasibility in many instances of connecting large induction motor-driven hoists to sources of power supply without causing line disturbances that would be detrimental to other operations. The Mather hoist cannot be used as an example in this respect, so another similar installation will be chosen for this purpose.

Some time ago it was desired to practically double the output handled by a double-drum hoist at a plant in West Virginia. This unit at the time was driven by a 350-hp. induction motor with contactor control. The peak in starting was about 850 hp. This machine was supplied with energy from the mining company's central station, which was loaded practically to capacity. As a result the operation of the 350-hp. hoist motor caused fluctuations in line voltage which were clearly evidenced by an appreciable flickering of the lights.

After a careful study of conditions it was decided to speed up this machine and equip it with a 600-hp. motor fitted with liquid rheostat control. With the new installation the peak at starting amounted to about 1,100 hp., but the effect on the line current with the 600-hp. motor and liquid control was less appreciable than that which had obtained with the 350-hp. motor and magnetic apparatus. The acceleration of the hoist under liquid control is so gradual that the governor on the 2,500-kw. generating turbine has time to pick up and follow the load variations, thus responding to the line demand.

It has generally been contended that a complete hoisting cycle occupying approximately twenty seconds and covering a distance of 500 ft. could not be made with a liquid controller, as it would be impossible to accelerate

REAR VIEW OF MATHER COLLIERIES HOIST HOUSE WITH TIPPLE IN BACKGROUND

This plant has a capacity of 5,000 tons per eight-hour day. The mine is laid out for a production of 8,000 tons, which tonnage would require, however, a duplication of the present tipple and hoisting equipment. The wing of the hoist house, containing the liquid controller, the primary oil switches and two magnetically operated reversing switches, may be seen in the foreground.

satisfactorily in a period of from five to eight seconds, as would be necessary in order to obtain a cycle of this duration. The results achieved at the plant alluded to refute this contention, as such a cycle is regularly attained. Furthermore this installation has proved that the operation of the liquid controller on such a cycle is not only feasible but reliable and practical. At Mather the hoist engineer is able easily to average three round trips per minute. This speed he attains whenever occasion requires. A full test of hoist capacity, however, has never been made.

A number of safety features have been incorporated in the hoisting equipment at Mather to protect the hoist in any emergency. Thus the drum cannot back away because of overload or power failure. It will not start after such an occurrence when power returns, even though the control lever be left in the running position. In event of overwind the hoist is automatically stopped and in such a case the driver is unable to start it again in the same direction in which it was traveling when the overwind occurred but must reverse the machine in order to resume normal operation. The hoist is automatically shut down if the operator does not keep the brakes adjusted or if the wear and tear upon them become excessive.

To reset any of the safety devices it is not necessary for the hoist driver to summon help, nor is he in danger of being struck by flying levers when any of the safety mechanisms operate. In case of overspeed the hoist is automatically brought to a stop; an emergency push button also is provided by means of which the hoist engineer can cut off all power and stop the machine in case of emergency. And lastly, all electrical devices and switches are so protected that accidental contact with them is impossible. None of the safety features mentioned interferes in the least with the normal operation of the hoist.

LIQUID-CONTROLLER TANK

By means of the centrifugal pump at the foot of the illustration the electrolyte is kept in continuous circulation from the lower to the upper compartment of the tank. Note the operating rod on the right. The hoist operator manipulates this when opening and closing the weir sluices in the upper compartment.

Two Metal-Mine Developments Suggestive Of Anthracite-Mine Possibilities

COAL-MINING engineers may grasp in a measure the size of some metal-mining developments from a paper presented at the recent meeting in New York of the American Institute of Mining and Metallurgical Engineers showing that the Phelps-Dodge Corporation is removing a small mountain known as Sacramento Hill, located near Warren and Bisbee, Ariz. That company will lower this mass of rock 716 ft. The material is removed by seven 100-ton shovels with $3\frac{1}{2}$-yd. dippers, having a maximum lift of $27\frac{1}{2}$ tons. Its Western Wheel dump cars have rated capacities of 20 and 25 cu.yd. and are operated by compressed air. The fifteen locomotives in use each weigh between 53 and $54\frac{1}{2}$ tons.

All the waste material passes over 2½ per cent grades with switchbacks, so that the train may reach a favorable elevation for dumping. The Phelps-Dodge Corporation does not believe that because it has a big job it should attack it with small equipment. The shoveling on Sacramento Hill is quite similar to that in the anthracite region only harder for the most part, but the equipment used in the hard-coal region is for the most part much smaller. If it were heavier the range of permissible stripping would be greatly increased. Though hills of the order of that near Warren, Ariz., could not be tackled to obtain anthracite, far larger excavations than now are usual could be made where the coal is thick, clean or in danger of fire.

FLOODING WITH SILT IS EXTINGUISHING FIRE

Another example of a metal-mining problem similar to that encountered in many anthracite mines is the extinguishment by hydraulic filling of a mine fire on seven levels of four mines in Butte, which was described in a paper by H. J. Rahilly, presented by W. P. Daly at the meeting just referred to. In this work one foreman, two assistant foremen, one office man, nine shift bosses, thirty-three diamond-drill men, 130 miners, loaders and timbermen, of whom seventy-five are trained to wear oxygen apparatus for performing the necessary work in gas, twelve pipe men, eighteen cement-gun men, three discharge men, six hoisting engineers, one oiler, six station tenders, six tool carriers, six drain men and twenty laborers are employed.

The material used is tailings rock, all but 0.70 per cent of which is less than 40-mesh and 58.40 per cent passes a 200-mesh screen. The filling is carried down the shaft by 6-in. cast-iron pipes and is distributed by both 6-in. cast-iron and 4-in. cast-iron and wrought-iron pipes, being fed into the burning area through diamond drill-holes or through old concrete bulkheads which were broken through by blasting, the men using oxygen breathing apparatus.

In this work the drillholes are used where the rock is prohibitively hot. The water is drawn off at lower levels and pumped back to the surface. It is found that if the pressure head is 100 ft. the fine slimes will travel on the levels from 800 to 1,000 ft. from the point where they are discharged, thus filling up a large area. Pressure heads of 500 ft. have been used. The material flushed into the mine contained 25 to 30 per cent of solids. Two-inch water lines follow the tailings pipe, connections with 2-in. valves being made at all curves and junction points, in order to flush the tailings pipe with clear water after shutting off the tailings, because if the solid particles are allowed to settle they will tend to plug the pipe line.

Telephones are installed at points convenient to each discharge place so that communication can be established between any part of the mine or surface. This is very important because: (1) All valves must be set properly before changing the sand from one working to another, otherwise the pipe line would be plugged. (2) The pipe must be flushed thoroughly with water after filling a working, otherwise the sand would be likely to settle and plug the pipe. (3) The flow of sand can be changed quickly to places unaffected should leaks through the ground or breaks in the pipe line occur. The sands are run into any one working from four to eight hours continuously and then the flow is changed to another working, enough places being kept available for continuous operation. Sand is run into no working for more than eight hours in each forty-eight.

After a working has apparently been completely filled, a few holes are drilled into it to make certain that no openings are left and that no gas or fire exist; also an accurate account of the quantity of sand flushed into any working is kept and an approximation of the quantity of material that the stope should take is made from the maps.

Declares Permissibles Are Superior to Black Powder for Coal Blasting

THAT the use of permissible explosives in coal blasting operations is not only safer but in the final analysis more efficient and economical than the use of black powder is emphasized by H. Foster Bain, Director of the Bureau of Mines. The present closely competitive market in bituminous coal forces the operator to produce the maximum amount of lump coal, which commands a higher price than the smaller sizes, declares Director Bain. This in turn leads the mine operator and superintendent to produce the greatest possible percentage of lump coal with as little fines and slack as is possible. It has been brought to the attention of the bureau, however, that there is a belief at some mines that a somewhat larger percentage of lump coal may be obtained by using black powder as an explosive than one of the permissible explosives on the Bureau of Mines' list.

To those companies that have adopted the use of permissible explosives the bureau wishes to state that permissible explosives, if properly used, in not excessive amounts, will not produce any more slack and fines than will black powder. The Bureau of Mines believes that a man who will use permissible explosives without skill will likewise use black powder without skill.

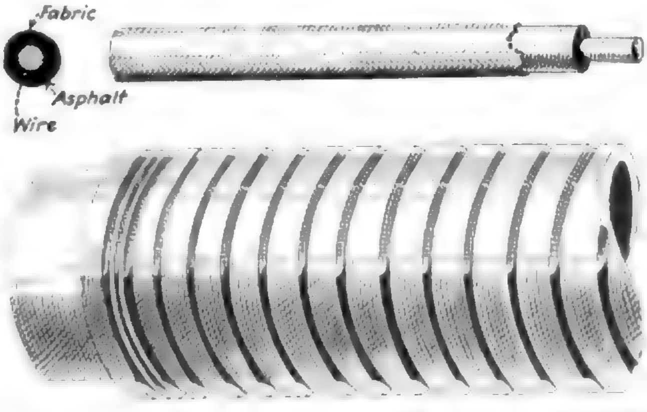
To those operators and superintendents who have not yet adopted permissible explosives, the bureau emphasizes that the gain in safety to the miners and the mine and, in the long run, the consequent decrease in the cost of operating the mine, more than offset any extra cost of permissibles or slight loss of lump which may occur until the miner learns how to load and fire properly his permissible explosive.

Wire by Which Wood Pipe Is Bound Is Laid In a Groove and Coated with Asphalt

WOOD pipe in a mine fails not from the impermanence of the wood but from the corrosion and the breaking of the bands by which it is bound together. With the winding wire properly protected from the corroding effect of the mine waters wood pipe will have a life of many years. The mine water preserves wood, but it is of no avail if the binding wires or bands are destroyed, causing the pipe to fall apart.

For this reason the American Wood Pipe Co., of Tacoma, Wash., uses a wire covered by a heavy coating of specially prepared asphalt. The covered wire is then run through a braiding machine which firmly binds the asphalt on the wire with a cotton braid. If it were not for this braid, much of the coating would be scraped off in the process of banding.

A section of the assembled pipe is then placed in the banding machine and the coated wire is wound spirally round the pipe under high tension. The banding machine has an attachment that cuts a groove in the pipe ahead of the wire, which sets into the groove so snugly that the coated wire does not project beyond the pipe. Consequently the wire is protected from any possible chance of mechanical injury and the binding wire cannot be dislodged.



COVERING OF WIRE BANDS ON MINE PIPE PROTECTED FROM ABRASION BY INSERTION IN GROOVES

The lower part of the illustration shows the spirally grooved pipe ready for the insertion of the wire by which the pipe is bound. A wire is used instead of a flat band. This section would tend to increase the life of the band, but any need of this kind is fully provided by coating the wire with asphalt, by surrounding the asphalt with a woven coating and by covering the pipe after winding with another coat of asphalt. It would, indeed, be unusual abrasion that would reach these bands.

So much for the binding of the pipe. The pipe itself is made of clear, kiln-dried fir staves free of sapwood. These staves have a finished thickness of 1½ in. After the pipe is wound it is sent to the heading machine, where a tenon is turned on one end and a mortise is reamed out at the other. By the exercise of due care a tight driving fit is assured.

The outer surface of the section of pipe is next dipped in hot asphalt, which completely embeds the coated wire in its groove and also acts as a preservative to the staves. After rolling in sawdust a binder coating is added, which will not melt in the hottest summer sun. The coating of a length of treated pipe kept in a dry kiln for thirty days at a temperature around 180 deg. actually becomes harder under the severe test. The pipe will sustain heads from 100 to 400 ft. or even higher pressure. One 8-in. pipe has operated for five years under a head of 600 ft.

Problems of Operating Men

Edited by James T. Beard

Measuring Voltage Drop on Rail or Feedwire

Locating Defective Rail-Bonding or Bad Joints in Feedwire—Resistance Employed to Regulate Current—Voltmeter Readings Taken at Regular Intervals on Entry

In reading the excellent article of B. F. Grimm, published some time since in *Coal Age* (Aug. 25, p. 291), I note his reference to defective bonding and poor joints in feedwires, being a cause of frequent armature burnouts.

Mr. Grimm states the case in the following words: "A frequent cause of armature burnouts is low voltage as the result of inadequate track-bonding and poor joints in feeder wires." I heartily agree with him in this statement, which conforms to my own experience.

In that connection, I wish to submit a method that I have found useful in measuring the voltage drop on any given section of track, for the purpose of locating trouble in the rail-bonding, or bad joints in either the trolley wire or the transmission line.

For that purpose, the entire length of the system is first divided into equal sections of, say one thousand feet in length, by the stations marked *A*, *B*, *C*, *D*, *E*, in the figure.

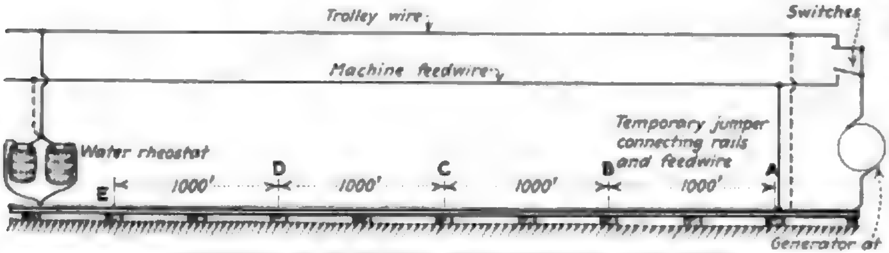


DIAGRAM OF ELECTRIC HAULAGE ROAD IN MINE

The method of procedure is as follows: A water rheostat or some other form of portable resistance, such as a locomotive with the brakes set, so as to draw a current of, say 200 amp., is installed at the inby end of the system.

At this point, an ammeter reading is taken, which will tell the exact amount of current flowing. In the figure, the trolley wire is shown as connected with the rails at the inby end, while the outby end of the track rails is connected by a wire conductor with the generator in the powerhouse.

The use of a water rheostat, in a close place, may be objectionable owing to the gases produced. Unless the place is well ventilated, the gas set free at the rheostat may prove dangerous. If a locomotive is used with brakes set care must be taken not to overheat or burn out the resistance.

In the figure, the trolley-wire switch is shown as closed, while the machine-feedwire switch remains open. The feedwire is connected with the rails, at the outby station marked *A*, by a temporary jumper.

The rails will, of course, be grounded at various points along the road, particularly if the mine is wet, and this grounding will be greater at some points than at others, owing to the varied conditions. This grounding of the rails, however, will have little if any effect on the voltmeter readings, which are to be taken at the various stations along the track.

In order to show how slight the effect of the grounding of the rails, we will suppose a voltmeter reading to be taken first at Station *E*. At that point the voltmeter is first connected in between the trolley wire and the rail. Its reading will then show the combined drop on the trolley wire and the rail. Here, we find that the trolley wire is electrically positive as compared with the rail.

Another reading is now taken, at the same point, with the voltmeter connected in between the rail and the machine feedwire. This reading is found to be somewhat less than that first taken. It shows the total drop on the rail, from Station *E* to Station *A*, where the jumper connects the feedwire with the rail. This second reading shows that the rail is electrically positive as compared with the feedwire.

These facts together with the fact that the ground will carry all the current that this small voltage drop can push through it, between points where the rail may be grounded, shows clearly that the voltmeter readings taken at the several stations along the track will not be affected.

In other words, we are determining the condition of the return circuit which, in this case, consists of the bonded rail and the ground combined; but all the current will eventually return to the rail, before reaching the wire connection to the generator.

Assuming that we know about what voltage we should have, per thousand feet of track, with a given current flowing and the bonding in good shape, it is clear that the successive readings, taken at stations from *E* to *A*, will show in what section the most trouble lies.

It is not claimed that this method will locate any one bad bond, but merely that it will show the general condition of the bonding in each respective section of the track. There is no way of which I know that will determine the exact condition of each bond, without reading each bond separately with a bond tester.

It is clear, however, that this plan of proceeding will very much reduce the work of locating serious trouble in the system. When a particular section has been found to be defective or below par in effective transmission, the trouble can be run down quickly by taking intermediate readings at different points of that section. The voltmeter used should be a low-reading instrument.

It is evident that, in order to make a similar test of the trolley wire, it is only necessary to connect the temporary jumper, at Station *A*, with the trolley wire, as shown by the dotted line in the figure. Then open the trolley-wire switch and close the machine-feedwire switch. At the same time, the inby end of the machine feedwire is connected with the rails through the water rheostat, as indicated by the dotted line, thus leaving the trolley wire dead in this case. The voltmeter readings are then taken between the rail and the trolley wire, at each successive station, until the trouble is located.

Hillside, Ky. F. C. Sinback.

Speed of Fan at Firing Time

Speed of fan at firing time regulated by conditions in the mine—Small mine, thin coal may require speed reduced—Old mine, thick coal, speed increased.

Referring to the Examination Questions answered in *Coal Age*, Dec. 22, p. 1017, kindly permit me to offer a few comments, by way of expanding on the excellent reply given to the first question on that page. The question asks whether the fan ventilating a mine should be run at normal speed or slowed down, at firing time.

The reply to this question has very properly mentioned the almost universal practice of running a fan at its normal speed, at the time of firing shots in the mine, stating also that in some cases the fan is run at an increased speed at that time.

What interested me the most, however, was the further reference to possible conditions that may require the speed of the fan to be regulated accordingly. It is this point that I wish to emphasize and illustrate by giving one or two concrete examples.

CONDITIONS IN A NEW MINE MAY REQUIRE SLOWING OF FAN

First, let us assume that Dick has charge of a mine working a seam of coal varying from 40 to 48 inches, in thickness, and overlaid with a hard sandstone roof. The mine is practically a new one, the length of the main heading not exceeding, say 4,000 ft. The mine is dry and there is much dust accumulated in the workings, the coal being blasted off the solid.

We will say that the mine is ventilated by a 6-ft. blowing fan, producing 12,000 cu.ft. of air per minute. From the description given, it is quite evident that this new mine affords no room for the expansion of the hot gases caused by windy shots, which are liable to occur in the blasting of the coal.

Under such conditions, no one will deny that a windy or a blownout shot will throw much fine dust into suspension in the air. The question that now presents itself to the practical mind is, shall we keep the fan running at its normal speed, under these conditions; or shall we slow down the fan to, say one-third of its normal speed. My judgment is in favor of the latter.

SPEEDING THE FAN WHEN FIRING IN A LARGE GASEOUS MINE

Again, let us assume that Tom has charge of a larger mine that is fully developed and, perhaps, the workings are so extensive as to require booster fans, at different points in the mine. We will say that the circulation in this mine is 50,000 cu.ft. of air per minute.

Consider, for a moment, the conditions that must exist in these extensive workings. Our experience tells us that the air becomes warm, almost to a degree that is unbearable. In addition, we will assume that the mine is generating gas and, like the one first mentioned, contains accumulations of dust due to blasting the coal off the solid.

Here, again, the question is asked, shall we keep the fan running at its normal speed, at a time when shots are fired in the mine; or shall we increase the speed of the fan, in this case, with a view to cooling the air passing through the workings and, by increasing its velocity, give it more power to sweep away the gases produced by the firing of so large a number of shots throughout the mine.

In this instance, my plan would be first to sprinkle or spray the dust, avoid any excessive accumulations at the working faces and inspect each place, making careful tests for gas before firing any shots therein. In addition to these precautions, I would increase the speed of the fan, for the reason previously mentioned. This is one of the most interesting questions that has been presented for some time and I hope to hear the views of others giving their practice and preference.

Crawford, Tenn. OSCAR H. JONES.

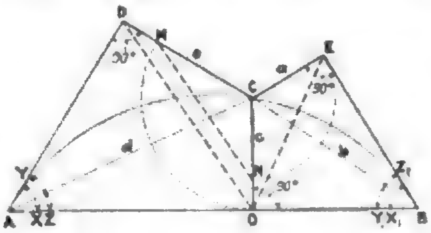
Problem in Geometry

Solution depends on a single principle, which is a property of the circle—Angle between chord and tangent measured by half the subtended arc.

REFERRING to the unfinished problem appearing in *Coal Age*, Feb. 23, p. 334, which space did not permit being completed, we had hoped that some interested reader would furnish the correct solution.

However, none of the answers received up to this time are either correct or simple. It was desired to show that an ordinate at any point of the chord of an arc of a circle is a mean proportional between the two perpendiculars drawn from the end of the ordinate to the respective tangents to the circle, at the two extremities of the chord. The solution is as follows:

Referring to the accompanying figure, which is identical with that on page 334, with the addition of the two subchords AC and BC, we have designated the several angles involved, by X Y Z and X_1 Y_1 Z_1; and the sides of the trianges by a, b, c, d, e.



The solution depends on a single principle, which is a property of the circle; namely, the angle between the chord of a circular arc and the tangent to the circle, at one extremity of the chord, is measured by half the subtended arc.

APPLYING THE PRINCIPLE

Applying this principle and referring to the figure, the angles X and X_1 are each measured by half the arc ACB; and the angle Y is measured by half the arc AC; and the angle Z_1 by half the arc BC.

But, the angle Z_1 being the difference between the angle X and Y, is also measured by half the arc BC, which is the difference between the arcs ACB and AC. Hence, the angles Z and Z_1 are equal, each to each. Likewise, the angles Y and Y_1 are equal, each to each.

Now, in the right triangles AOC and BEC, the angles Z and Z_1 being equal, the triangles have all their angles equal, each to each, and are therefore similar and their corresponding sides are proportional; thus,

$a : b :: c : d$ 1.

Or, $a : c :: b : d$ 2.

Again, in the right triangles BOC and ADC, the angles Y and Y_1 being equal, all the angles are equal, each to each, and the triangles similar, making their corresponding sides proportional; thus,

$c : b :: e : d$ 3.

Or, $c : e :: b : d$ 4.

But, the second couplet of the proportions 2 and 4 being identical, their first couplets will form a proportion; thus,

$a : c :: c : e$ 5.

which shows the ordinate c is a mean proportional between the two perpendiculars a and e, drawn from the end of the ordinate to their respective tangents, which was to be proved.

Finally, since, a is equal to CN; and e to CD; and c equals both CO and CM, we can write from the last proportion:

$CN : CO :: CM : CD$

Which makes the two triangles CNM and COD similar triangles, having their corresponding sides proportional and their corresponding angles equal each to each. Therefore, the line MN is parallel to the line DO.

New York City. J. T. B.

When It Is Safer to Seal Off Abandoned Areas

Conditions that make it unsafe to ventilate abandoned places — Tests show air behind seal non-explosive, owing to lack of oxygen—Seals must be well built and care taken not to break into the sealed sections.

WHETHER a worked-out and abandoned section in a mine should be sealed or ventilated, to afford the greater degree of safety, has held the attention of numbers of readers of *Coal Age*, recently. No doubt the conditions that prevail underground will vary judgment in this regard, in many cases.

One writer in the issue, Feb. 2, p. 210, expresses himself as being strongly in favor of ventilating all abandoned areas, claiming that the practice of building seals to close off such places is highly dangerous, because of the more rapid generation of gases within the area, by reason of the natural rise of temperature when the circulation of air is cut off.

MINES IN WHICH ABANDONED AREAS ARE SAFER WHEN SEALED

That writer may be suprised to learn that there are conditions under which the ventilating of large abandoned areas would be decidedly unsafe. In support of this statement, allow me to cite a few instances in the practice of coal mining in this state.

The American mine No. 1, Indian Creek and Bruceville mines, all working No.-5 coal, in Indiana, are subject to conditions that require the sealing off of those sections of the mine that are worked out and abandoned. It would be unsafe, if not impossible, to work any of these mines with safety if the old works had to be ventilated and remain open.

The conditions are such that the roof caves badly and sets free enormous quantities of gas that accumulates on the falls. To attempt to ventilate large areas subject to these conditions would only result in failure and disaster.

General Indiana Practice

Instead of this, the general practice in Indiana, has been to seal off the old panels as quickly as they are finished. If this was not done and the places were allowed to remain open the entrance of fresh air would render the gas accumulated on the falls highly explosive.

The writer to whom I have referred speaks of the possibility of gas being ignited by a fall of rock striking sparks. That would be just what would happen in these mines were the abandoned areas to be left open, allowing the entrance of fresh air.

On the other hand, the sealing off of such areas makes such an occurrence impossible. Numerous tests made of the air issuing from the pipes built in the stoppings show that the oxygen has been practically exhausted in a short time after the seals were built.

At the time a seal is first closed the air inside is the same as that outside of the seal; but, as time passes, tests made of the air show the presence of methane, carbon dioxide and carbon monoxide, with gradually decreasing percentage of oxygen, which has been consumed by the various reactions due to slow combustion taking place in various forms within the area.

In my opinion, under the conditions I have mentioned, there is more safety in the building of good seals than would be possible to attain by any amount of ventilation of these abandoned areas, because of the difficulty of sweeping to slow combustion taking place in the places clear.

It should be understood that the gas, in these mines, comes down and can be detected within five or six feet of the top of the coal, and is highly explosive for eight or ten feet above that, while pure gas fills the cavity above.

The sandrock or "steel band," as it is called, lies about 5 ft. above No.-5 coal. The falling of this rock affords every liability of gas being ignited by the sparks struck when the rock falls, provided air is present in sufficient quantity to make the mixture explosive.

Another point of less importance, however, is that the sealing off of these places when finished reduces the friction and decreases the mine resistance.

Wheatland, Ind. **Albert Rickets.**

Inquiries Of General Interest

Speed in Locomotive Haulage in Mines

Mine Locomotives, General Speed Rating 8 Miles per Hour, Maximum Load—Power to Drive Machine Determined by Tractive Effort and Speed Under Full Load —Tractive Effort Estimated from Weight on Drivers

Although some of the questions I am about to ask may seem foolish it is for the sake of settling an argument that we desire to have them answered in *Coal Age*. This favor will be greatly appreciated by a few of us, who have been debating the subject and have not been able to come to any agreement. The questions are the following:

1. What is the rated or geared speed of a mine locomotive, say a machine weighing 10, 12 15 or 20 tons? 2. What is the maximum speed of said locomotive on a level track? 3. Can a 20-ton motor be operated at 40 miles an hour? 4. Assuming a 4 to 6 per cent grade, in favor of the loads, what would be the speed of the trip when the motor is hauling a load to its full capacity; or, in other words, using its full power?

State College, Pa. **Mining Student.**

We will answer these questions in the order they are asked, giving the information that we believe is most desired.

1. A quite common practice, in the manufacture of mine locomotives, is to design the motor driving the machine so as to enable it to haul a full load at a speed of 8 miles per hour. By "full load" is meant the hauling capacity of the machine. When hauling such a load, the motor is using, perhaps, about two-thirds of the power for which it was designed, since it is always well to have a surplus of power, in the motor, that will enable it to meet all exigencies.

Whether the locomotive is direct acting or geared will have no effect on the tractive effort the machine can exert and which is applicable to moving the entire trip including the locomotive and its train. As is well known, the effective power of the motor, after allowing for the internal resistance in the machine, is the product of the tractive effort, as determined by the adhesion of the wheels to the rails, in pounds, and the speed of the train, in feet per minute.

Just here, it is well to remind this student that the tractive effort determined by the adhesion of the wheels of the locomotive to the rails is a factor of the weight of the machine resting on the drivers, which, in a four-wheel locomotive, is the entire weight of the machine. It is safe practice to assume the tractive effort of a mine locomotive as one-fifth of the weight resting on the drivers, provided the rails are clean and dry and the track in good condition. The kind of tires and the condition of the rails, whether wet or dry, greasy or sanded, will vary this factor of adhesion, which may range, perhaps, from 10 to 30 per cent of the weight on the drivers.

2. The maximum speed of a locomotive hauling a train on a level track is plainly dependent on the load hauled. Under full load, or when the locomotive is hauling to its full capacity, the speed will not much exceed the speed rating of 8 miles per hour. When hauling a lesser load the speed of the train will vary inversely as the load.

3. A 20-ton locomotive operated on a good track is estimated to develop a tractive effort of $(20 \times 2{,}000) \div 5 = 8{,}000$ lb. Then, assuming the cars are mounted on roller bearings and in good condition, giving a track resistance of, say 10 lb. per ton, the weight of the train, including locomotive and cars hauled per trip, will be $8{,}000 \div 10 = 800$ tons.

This load, including the weight of the machine, a properly designed locomotive should be able to haul, on a level track, at a speed of 8 miles per hour. But, since the speed varies inversely as the load, the same locomotive should haul one-fifth of this load or 160 tons, at a speed of 40 miles per hour, approximately.

4. Assuming an average 5 per cent grade, in favor of the loads, the track resistance, in pounds per ton of moving load, will be reduced $0.05 \times 2{,}000 = 100$ lb. per ton when on the down grade. According to the style of equipment, whether plain or roller bearing, the track resistance may vary from 10 to 30 or even 40 lb. per ton of moving load. We will assume, here, an average mine equipment, giving a track resistance of, say 20 lb. per ton. In that case, the 5 per cent grade factor being in favor of the loaded cars, the entire train will gravitate under a force of $100 - 20 = 80$ lb. per ton.

Then, since 20 lb. per ton develops a speed of 8 miles per hour, in moving this train, and since the velocity moving a given mass varies as the square root of the force applied, the speed produced, by a moving force of 80 lb. per ton, will be $\sqrt{4} \times 8 = 16$ miles per hour. In this case, when the train is descending the 5 per cent grade, under the assumed conditions, the power of the motor will not be utilized but the train will gravitate at the speed mentioned, approximately.

Examination Questions Answered

Alabama Second-Class Examination, Birmingham, July 23-28, 1922

(Selected Questions)

QUESTION—*What are the causes of falls of roof and how would you make an inspection to determine the security of a roof in a mine?*

ANSWER—Falls of roof result from insufficient timbering, or an improper mode of timbering the entries and working faces in the mine. A fall may result from the failure to set posts where and when needed. Too rapid extraction of the coal over a large area with insufficient pillar support will generally develop a creep or squeeze, followed by heavy falls of roof.

When inspecting a mine to determine the security of the roof, each working face must be carefully examined to discover any possible slips in the roof, or other faulty strata. Attention must be given to the manner in which each place is timbered. A systematic method of timbering, adapted to the particular conditions in a place, will insure the greatest degree of safety. Too much reliance must not be placed on sounding the roof with a pick or hammer. When sounding a roof the left hand should be held against the roof as the blow is struck, as a means of detecting more certainly its condition. All working faces should be inspected by competent persons, at frequent intervals, while the men are at work in their places.

QUESTION—*Describe how you would construct a good, cheap and durable brattice, in breakthroughs on entries and in rooms.*

ANSWER—A cheap, but good and durable form of stopping, for breakthroughs on entries, consists in building a double wall of slate or rock in the opening and filling the space between the two walls with dirt taken from the road, or sand where that is obtainable. The work must be carried up to the roof and all cracks and crevices plastered with clay. Room stoppings require less care in building than those on entries, but are built in much the same manner.

QUESTION—*Name and describe the different haulage systems with which you have had experience and state the conditions to which each is best adapted.*

ANSWER—The two general types of mine haulage are animal haulage, by mules or horses, and mechanical haulage, by means of ropes and cables, or by locomotives driven by electricity or compressed air. Mule haulage is adapted to short hauls in a newly opened mine and gathering hauls, at the working faces of larger mines, for the purpose of collecting the cars loaded by the miners and assembling them at partings, to be hauled out of the mine in trips. The empty cars are distributed to the working faces by the same means.

Rope haulage includes gravity-plane haulage on inclines where the descending loaded cars pull the empties up the plane; and engine-plane haulage where the cars are raised and lowered by a winding engine located at the top or bottom of the plane. Another form of rope haulage is that known as "main-and-tail-rope haulage." The main rope is attached to the head end of the loaded trip, which it hauls out of the mine, as it winds on the drum of the engine on the surface or at the shaft bottom. At the same time, the tail rope unwinds from the drum and passes from the engine to a tail sheave at the inby end of the haulage road where, after passing over the tail sheave, it is attached to the rear end of the trip. The tail rope also serves to check the speed of the loaded trip and to haul the empty trip back into the mine.

Still another form of rope haulage is that known as "endless-rope haulage," consisting of a single rope passing, from the winding drum of the engine, through the mine and over the tail sheave and returning again to the engine. This rope is run continuously, the cars being attached to the rope at regular intervals, both going out and returning into the mine.

Gravity-plane haulage is best adapted to steep inclines where the cars are moved by the action of gravity. Engine-plane haulage is used where the inclination of the plane is too steep to afford safe control of the moving trip. In engine-plane haulage the engine hauls the trip up the plane and the cars are returned to the bottom by gravity. Tail-rope haulage is best adapted to light variable grades, while endless-rope haulage is generally applied on long level roads.

Locomotive haulage is particularly adapted to handling large outputs on long hauls and winding roads, where rope haulage could not be employed to advantage. The choice between electric and compressed air locomotives must depend on the mine equipment.

QUESTION—*What is the general rule for timbering a room 30 ft. wide, with a tender roof?*

ANSWER—The roof conditions should be carefully studied and a systematic form of timbering adopted to suit those conditions. The posts should be set in rows parallel to the face of the coal. In general, two rows will suffice, but the posts in successive rows must be staggered. The posts are set at regular distances apart, which must be determined by the nature of the roof to be supported. Likewise, the distance of the first row from the coal face and the distance between the rows is determined by the character of the roof. As the coal face advances, the posts in the rear row are taken out and reset closer to the face.

QUESTION—*If you found the air current was insufficient, how would you proceed to remedy the same without installing new machinery?*

ANSWER—First, clean up all aircourses and remove every obstruction to the flow of air throughout the mine, enlarging all breakthroughs, in rooms, and crosscuts, in entries. Wherever practicable, shorten the distance the air must travel. Much advantage will be derived, also, by splitting the air current where this can be done without reducing the velocity, at the working faces, below what is required to keep the workings clear of gas. We assume that the fan is operating at a maximum safe speed.

QUESTION—*What must be carefully considered before the work of drawing pillars is begun?*

ANSWER—Before starting to draw pillars in a mine, the effect on both the surface and the adjoining workings in the mine must be carefully considered and whether it is possible to gain any advantage by carrying the face further, in that section. Regard must be had to keeping the line of pillarwork uniform, in a given section of the mine, in order to avoid causing excessive pressure on the ends of any one of the pillars more than on the others. Every possible precaution must be taken to avoid the danger that may be caused by the presence of water or gas in the roof strata. When once begun, the work of drawing pillars must be carried forward regularly and continuously, in order to obtain the best results. Only experienced miners should be employed in the work.

QUESTION—*How can a mine foreman best gain and hold the respect of the workmen and always have his instructions carried out?*

ANSWER—By establishing for himself a reputation for fairness and square dealing, and by taking care to instruct his men in a practical way, that they will realize that he has their best interest and welfare in mind, there will be little danger of a foreman losing the respect of his men, both for himself and for the orders and instructions given them. A foreman should never ask his men to take a risk he is unwilling to take himself; or expect them to perform work more quickly and better than he could do it himself. Men are quick to observe these qualities in a foreman and the orders and instructions of such a man are generally obeyed without question.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

IN THE past month or so business has shown some hesitation, but fluctuations in business activity are to be expected this year, and the slowing up presents no new aspect, according to the *Commerce Monthly* for March, being in part seasonal and in part the result of renewed caution in buying and in commitments for the future.

"Consumers continue to demand real values," the review continues, "and are confining purchases to actual necessities. Apparently special clearance sales have had but limited effect in stimulating demand, and as a result of the consumers' attitude, retailers and jobbers are disposed to be extremely cautious. Manufacturers are booking only a moderate volume of future orders notwithstanding light stocks in the hands of retailers. Labor adjustment in New England cotton mills and continued high cost of raw materials have been disturbing factors in woolen, worsted and silk manufacture, but no marked reduction has taken place in the operation of these or other major industries.

"The outlook continues to justify faith in gradual improvement in 1922. The experience of the closing months of 1921 will doubtless be repeated. Orders probably will be numerous, but for small amounts for prompt delivery, serving to keep production at a fairly satisfactory rate in most staple lines. Operations under these circumstances will be difficult, but sounder trade and labor conditions will certainly result.

"The outstanding fact in the world today is the economic strength and soundness of the United States. This is strikingly evidenced by the character of the statements for 1921 made by many firms and corporations. While the results for the year reflect losses so large that even those most intimately in touch with both the broad and the detailed aspects of these businesses were hardly prepared for them, reductions in working capital and in surplus accounts have paradoxically left most firms and corporations in a sounder financial situation than for many years. The sharp reduction in liabilities against even reduced assets has left room for healthy growth and development, where in the past in many cases this was not possible.

"The results of business depressions are by no means wholly evil. Easy profits result in inefficient and careless business habits and in individual and corporate extravagance. Hard times compel efficiency and thrift."

Roads Place Large Steel Orders

The Pennsylvania R. R. is reported to have placed one of the largest orders for accessories in years, comprising 400,000 lb. of track spikes, from 100,000 to 200,000 tie plates and 100,000 heat treated track bolts.

The Illinois Steel Co. has contracted to supply 2,000 tons of rails to the Minneapolis, St. Paul & Sault Ste. Marie Ry. The Buffalo, Rochester & Pittsburgh and the Hocking Valley also are reported to be large buyers of accessories. They recently purchased 5,000 and 3,000 tons of rails, respectively, from the Lackawanna Steel Co.

An increased demand for steel products is more plainly indicated, but throughout the trade great care is taken lest its extent be overstated, according to the *Iron Age*, which says:

"Operations continue at the higher rate shown by February statistics. For the Steel Corporation they are slightly under 60 per cent this week, and for the whole industry are probably between 55 and 60 per cent. Buyers and sellers are watching closely for developments in three directions—the coal strike, spring demand, and the effort of the steel companies to advance prices on plates, shapes and bars."

Car Loadings Gain 67,969 in Week

Cars loaded with revenue freight during the week of March 4 totalled 803,255, compared with 735,286 in the week ended Feb. 25, according to the American Railway Association. This was principally due to heavier traffic in merchandise and miscellaneous freight, which includes manufacturerd products, and also coal. The total shows an increase of 91,888 over the same week last year. However, loadings were the largest for any week since Nov. 5, 1921, when the total was 829,522 cars.

Fewer Idle in Pennsylvania

The number of workers idle throughout the State of Pennsylvania showed a decrease of about 5,000 during February, according to the semi-monthly bulletin of the State Department of Labor and Industry, recently issued. The unemployed on March 1 numbered 308,450, as compared to 313,835 on Feb. 1.

Georgia Cotton Mill Expands

The Eatonton Cotton Mills, Eatonton, Ga., which manufacture sheetings, etc., are improving and enlarging the plant. Approximately 20,000 square feet will be added.

To Erect Tire Fabric Mill

The Thistle Cotton Mills, makers of tire fabric and yarns is about to erect a mill building at Ilchester, Md., in the near future. W. L. Rouse and L. A. Goldberg, New York architects are preparing the plans.

Predicts Prosperity in South

W. H. Kettig, chairman of the Birmingham branch of the Sixth Federal Reserve Bank, sees better times ahead for the South, as a result of the increased price of agricultural products including grains, hogs and cotton, according to the *Dry Goods Economist.*

"The advance in the price of agricultural products," he says, "puts the farmer, particularly in the West, in a much better position financially. It helps his purchasing power, and this in turn is an aid to the general business situation.

"The prosperity of the West will create a demand for Southern products and thus this section will feel the benefits." He points to the advance in foreign exchange as another good sign, certain to help the purchasing power of Europe and create a better demand for agricultural products.

Mr. Kettig sounded a note of warning against expectation of a boom, and declared that anyone looking for another period of inflation would be disappointed.

Chronology of Controversies as to Wages Since Jan. 1, 1922

Jan. 4.—Conference of United Mine Workers of America with the operators of the Central Competitive Field called off by John L. Lewis.

Jan. 10.—Nova Scotia Court of Appeals suspends injunction of Judge Russell restraining British Empire Steel Co. from making a new wage scale to replace that which had expired.

Jan. 13.—After three days' parley, union and operators in Georges Creek and Upper Potomac region adjourn indefinitely meeting to discuss wage scale.

Jan. 14.—Jackson County Circuit Court of Missouri refuses to to make permanent a temporary restraining order preventing the ousting of Alexander Howat as president of the Kansas district in the United Mine Workers of America.

Jan. 17.—Secretary of Labor Davis telegraphs Governor Edward Morgan of West Virginia asking him to stay the evictions of mine workers in New River field scheduled for Jan. 18.

United Mine Workers of three anthracite districts meet in Shamokin.

John L. Lewis, president of the United Mine Workers of America, made a statement declaring that no wage reductions would be permitted.

Jan. 28.—Pittsburgh Coal Producers' Association and the southern Ohio operators post scale for mine workers, effective April 1.

Feb. 1.—John L. Lewis, president, United Mine Workers, writes to the sixteen major railroad organizations requesting a meeting to discuss combined action against wage reductions.

Feb. 4.—Scotts Run operators announce 30-per cent reduction in wage, effective April 1, and abolition of check-off.

Feb. 6.—Alexander Howat, released from jail on bond appeal, declares his purpose is merely to defend his case before the Indianapolis convention, meeting on Feb. 14.

Feb. 9.—Samuel Gompers, president of the American Federation of Labor, announces that the "American labor movement and the American people will be with the miners if they are forced to fight to defend their rights."

Feb. 10.—Mine workers of British Empire Steel Corporation in referendum reject the Gillen arbitration award by 6,054 votes to 224.

Feb. 14.—United Mine Workers of America meets in special conference at Indianapolis and wage scale committee reports in favor of maintaining present wage scales in the bituminous region and increasing anthracite scale as provided at Shamokin conference, establishing eight hours from bank to bank and removing inequitable differentials in and between districts.

Feb. 15.—Mine workers' conference votes open ballot in favor of reinstatement of Alexander Howat as president of Kansas district and of his followers as union men in good standing. This was reversed on secret ballot later.

Feb. 18.—United Mine Workers of America adjourns, having narrowly escaped the repudiation of its national officers and having declared for short day and short week and for a 20 per cent increase in the anthracite region, an unchanged wage scale elsewhere and penalization for overtime and Sunday work.

Feb. 21.—John L. Lewis invites bituminous operators a second time to meet in a wage conference.—Illinois operators express themselves as willing at any time to join conference with other members of the Central Competitive region and with the representatives of the mine workers of that region.

Feb. 22.—Pittsburgh Coal Producers' Association and southern Ohio coal operators decline to accept President Lewis' second request for a conference between operators and the union.—Mine and rail workers at Chicago effect an alliance of chief executives with instructions to assemble a full conference if deemed necessary, this agreement to be operative only if ratified by constitutional authorities of unions of the alliance.

Feb. 23.—Pittsburgh Vein Operators' Association, of eastern Ohio, refuse to take part in the conference of the Central Competitive region.—Truro conference of Nova Scotia mine workers meets to discuss Gillen arbitration award and votes on Feb. 25 to reopen direct negotiations with the British Empire Steel Corporation.

Feb. 24.—Kanawha operators serve notice that if the union will not meet Kanawha operators before March 11 a new wage scale will be posted, the operators declare for the open shop and check-off and refuse to discuss latter.—President Harding, receiving newspaper men, stated that he had requested Secretary of Labor Davis to investigate whether there was not some way in which the mine workers and operators of the Central Co-operative Field could be brought into conference in accord with terms of wage contract.

Feb. 25.—Anthracite operators agree to a conference with the union.

Mar. 1.—Conference between representatives of United Mine Workers and British Empire Steel Corporation at Montreal results in tentative agreement.

Mar. 3.—Frank H. Farrington, district president of the United Mine Workers of America in Illinois, announces that his state organization will meet the Illinois operators. John L. Lewis declares that under the policy declared by the United Mine Workers no single-state settlements can be made.

Mar. 4.—J. B. McLachlan, secretary and treasurer of the Nova Scotia Mine Workers, and two district board members refuse to sign a letter advising mine workers to accept wage offer made by British Empire Steel Corporation, said to be a 20 per cent reduction instead of one of 25 per cent as under Gillen award and of 35 per cent as asked by company.

Western Mine Operators Association of Southern Alberta and Eastern British Columbia meets at Calgary, Alta., with mine workers of District No. 16 and disagree. Operators declare they will enforce their scale, which provides 30 to 50 per cent reductions.

Mar. 6.—Unions start voting on proposition to declare a strike April 1, if settlement is not made prior to that time. Voting will be continued till March 9. Unofficial returns said to favor strike overwhelmingly.

Mar. 7.—Representative Newton of Minnesota declares in House of Representatives that operators and owners of anthracite mines "are almost altogether responsible for excessive costs" and says "anthracite is worst run basic industry today."

Announcement made after Cabinet meeting that Harding administration would insist on coal operators discussing the wage scale with their employees.

Mar. 8.—Railroad-miner defensive alliance ratified by International executive board of United Mine Workers of America.

Mar. 13.—U. S. Supreme Court dismisses writs of error by which Alexander Howat and other Kansas Mine Workers officials sought a review of the decision of the Kansas state courts that found them guilty of contempt of court for refusing to appear before the Court of Industrial Relations.

C. Frank Kenney, president, District No. 17, tells Northern West Virginia Coal Operators Association, in conference at Baltimore, Md., with Mine Workers, that he is without authority to negotiate a scale until after meeting of the organization at Charleston, W. Va., March 21.

Mar. 15.—Anthracite operators and Mine Workers meet in New York City to make biennial agreement.

Federal Council of Churches of Christ in America and National Catholic Welfare Council call on bituminous operators to fulfill "pledge of honor" to meet with mine workers "in a supreme effort to avert strike."

Mar. 16.—Announcement made that Mine Workers of British Empire Steel Corporation by a vote of 7 to 1 rejected wage scale made by conference of Mine Workers' representatives and corporation officials, amending Gillen award.

James J. Davis, Secretary of Labor, in a speech in New York before women's department of the National Civic Federation calls coal mining a "dark industry" and adds that "it is filled with many dark secrets on both sides."

Kanawha operators postpone posting of new wage scale till March 30.

J. B. Reimer Decries Government Direction Of Private Enterprises

JOHN B. REIMER, of Queens Borough, New York City, who spoke on "Governmental Regulation" at the morning session of the regional meeting of the New York State Coal Merchants' Association, held at the Pennsylvania Hotel, New York City, on March 2, said that outside of strictly legitimate public functions there is nothing which the government can do which private management cannot do better.

Speaking of anthracite, he referred to the large company producers as compared with the independents and stated as his belief that the entire system of independent operation has not functioned properly during the past four years. Mr. Reimer asserted that the independents have taken advantage of every market condition which might add to their temporary advantage, financial and otherwise, thereby throwing the entire trade into discredit and ill-repute. It is inherent, he said, in the entire system of independent operation to continue this method unless the system is controlled by an organization or association within itself, to whom it will delegate or assign restrictive powers or unless it is controlled by an outside authority.

Mr. Reimer said the unfortunate part of the situation is that laws cannot be made which will discriminate and regulate 30 per cent of the trade without making those laws applicable to the other 70 per cent. It may be possible that economic conditions, such as a period of lessened profit or continued loss, would concentrate the holdings of smaller operators in the hands of stronger and larger interests. Or it may be possible that pre-war arrangements will be revived, allowing the companies to again enter into the 65 per cent contract with independent operators. The public has objected to this form of alleged monopoly, but has not yet learned that seven big hogs can be controlled and have more sense than fifty-seven little ones all of whom have a voracious appetite and an ambition to grow fat.

Mr. Reimer believes that public opinion will ultimately fasten some form of regulation upon the anthracite industry and contends that it needs certain forms of regulation. The first of these is that there must be a universal standard of preparation; second, a standardization of sizes; third, an elimination of wash sales and a fixing of commissions as between jobbers; fourth, a reweighing of coal cars at certain destinations or receiving points; fifth, equitable distribution in times of stringency based on previous years' tonnages, and sixth, the establisment of a bureau by the Federal Trade Commission for the collection of statistics, facts and costs of all the elements which enter into the mining, transportation and marketing of anthracite. Such a bureau would have to have authority to get whatever information it needed and not merely be the recipient of whatever information was voluntarily submitted.

Mr. Reimer said that so far as a retail trade is concerned, it needs education more than regulation—education in regard to costs, overhead, co-operation with its competitors; pooling of interests as regards the various forms of insurance; adoption of uniform systems, methods, practices, credits and a full realization that cut prices never yet made more profits, increased the consumption of coal in any community, or drove a competitor out of business.

The meeting was attended by about 400 coal dealers. Other speakers included Warren A. Leonard, president, Leonard Coal Co.; Bruce Barton; Charles Dorrance, vice-president, Hudson Coal Co.; Charles G. Edwards, president, Real Estate Board of New York; Roderick Stephens, president, National Retail Coal Merchants' Association, and Joseph E. O'Toole, executive secretary, National Retail Coal Merchants Association.

Illinois Mine Workers' Earnings, Jan. 1-15

EARNINGS during the two-weeks period Jan. 1-15, 1922, of workers in 102 Illinois coal mines employing 38,070 men producing a tonnage of 1,256,693 are shown in the subjoined tables. This is approximately 27 per cent of the mines; 45 per cent of the miners and 45 per cent of the total tonnage of the state for the period here shown. The mines included in this showing are located in all parts of the state and operate in coal seams ranging in thickness from 36 in. to 9 ft. The data, from members of the Illinois Coal Operators' Association, were compiled by F. C. Honnold.

There are three coal operators' associations in Illinois, operating a total of 373 shipping mines. The Illinois Coal Operators Association is the largest, having 179 mines, located in all parts of the state and producing normally about 58 per cent of the total tonnage of the state. The Coal Operators Association of the 5th and 9th District has 158 mines, all located within an average distance of 30-35 miles of East St. Louis, and produces about 31 per cent of the tonnage. The Central Illinois Coal Operators Association has 36 mines and produces about 11 per cent of the tonnage.

EARNINGS FOR TWO-WEEKS PERIOD, JANUARY, 1-15, 1922

	Northern Illinois	Danville	Fulton-Peoria	Springfield	Centralia	Du Quoin	—Southern Illinois Counties—			State Totals and Averages
							Franklin	Williamson	Saline	
1. Number of mines	8	6	15	10	5	5	19	21	13	102
2. Av. work time (days)	5	7.6	8.3	8.1	8.2	6	5.8	7.7	6.3	6.9
3. Tonnage	34,332	22,368	103,717	142,644	56,891	55,039	402,013	291,085	148,604	1,256,693
4. Total employees	2,852	607	3,170	3,686	1,708	1,743	12,236	7,229	4,839	38,070
5. Av. daily number all empolyees working at these mines	2,357	555	2,894	3,512	1,554	1,622	11,309	6,821	4,100	34,724
6. Number earning $50 or more in 2-week pay period	406	382	2,047	2,790	1,390	852	6,697	5,357	2,297	22,218
7. Av. earnings Group 6 2-week period	$75.79	$74.97	$81.21	$81.57	$76.10	$71.72	$79.47	$83.98	$79.39	$79.36
8. Percentage (Group 6) to av. number working daily (Group 5)	17.2%	68.9%	70.7%	79.4%	89.4%	52.5%	59.2%	78.5%	56%	63.9%
9. Percentage of total payroll paid to those making $50 or over	34.3%	77.6%	80.9%	82.1%	90.1%	65.3%	75.7%	86.6%	73.8%	77.8%
10. Number of men on payroll in excess daily average working (excluding mine office)	495	52	276	174	154	121	927	408	739	3,346
11. Percent absenteeism	17.3%	8.6%	8.7%	4.7%	9%	6.9%	7.6%	5.7%	15.3%	8.7%
12. Occupational deduction	$451.68	$777.35	$10,023.48	$5,783.84	$2,995.23	$2,628.01	$15,130.01	$17,347.75	$4,297.70	$59,435.05
Per capita	.161	1.283	3.202	1.604	1.767	1.533	1.263	2.461	.912	1.593
13. Check-off for miners union dues and assessments	$4,600.31	$1,288.60	$8,364.33	$9,987.94	$5,066.20	$3,224.71	$41,620.35	$21,747.18	$15,442.97	$111,342.59
Per capita	1.639	2.125	2.671	2.771	2.989	1.881	3.473	3.085	2.38	2.985
14. Av. deductions per ton:										
Occupational	.013	.034	.096	.041	.053	.047	.038	.059	.028	.047
Union dues	.134	.057	.08	.07	.089	.058	.103	.074	.103	.088
Total	.147	.091	.176	.111	.142	.105	.141	.133	.131	.135

AVERAGE DAILY EARNINGS BY CLASSIFICATIONS

	Northern Illinois	Danville	Fulton-Peoria	Springfield	Centralia	Du Quoin	— Southern Illinois Counties —			State Totals and Averages
							Franklin	Williamson	Saline	
Machine runners:										
Number of men	....	12	144	173	[illegible]	69	535	261	186	1,438
Av. earnings for the pay-period	....	$70.24	$94.79	$90.51	$70.56	$68.46	$86.77	$136.31	$92.[illegible]	$96.04
Av. for days mines hoisted coal	....	14.05	12.47	10.90	8.71	8.35	14.46	17.[illegible]	14.62	13.92
Av. based on every working day in 2 week period (11 days)	....	6.[illegible]	8.62	8.23	6.41	6.22	7.[illegible]	12.40	8.37	8.73
Loaders:										
Number of men	131	62	1,202	1,568	499	357	3,535	3,115	1,213	11,682
Av. earnings for the pay-period	$62.00	$67.72	$77.41	$83.33	$74.18	$66.57	$75.88	$75.40	$76.61	$76.32
Av. for days mines hoisted coal	12.40	8.92	9.32	10.29	9.07	11.09	13.08	9.79	12.16	11.10
Av. based on every working day in 2 week period (11 days)	5.64	6.16	7.04	7.57	6.76	6.05	6.90	6.86	6.97	6.96
Av. tonnage of loaders for days mine worked	4.2	7.5	7	9.1	7.7	9.1	11.4	9	10.3	9.1
Day men:										
Number of men	275	308	701	1,049	322	426	2,627	1,981	898	8,587
Av. earnings for the pay-period	$82.35	$76.61	$84.93	$71.64	$79.77	$76.56	$82.80	$89.62	$80.49	$82.51
Av. for days mines hoisted coal	16.47	10.09	10.35	8.84	9.72	12.76	14.27	11.64	12.77	11.95
Av. based on every working day in 2 week period (11 days)	7.48	6.97	7.72	6.51	7.25	6.96	7.53	8.15	7.31	7.50
Total (all classifications):										
Number of men	406	382	2,047	2,790	1,390	852	6,697	5,357	2,297	22,218
Number of mines	8	6	15	10	5	5	19	21	13	102
Av. days mines worked	5	7.6	8.3	8.1	8.2	6	5.8	7.7	6.3	6.9
Av. earnings for the pay-period	$75.79	$74.97	$81.21	$81.57	$76.10	$71.72	$79.47	$83.98	$79.39	$79.36
Av. for days mines hoisted coal	15.16	9.86	9.78	10.07	9.28	11.95	13.70	10.91	12.60	11.50
Av. based on every working day in 2 week period (11 days)	6.89	6.82	7.38	7.41	6.92	6.52	7.22	7.63	7.21	7.26

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Government Not to Intervene in Coal Controversy Prior To April 1; Failure to Confer Helps Miners

By Paul Wooton

Washington Correspondent of *Coal Age*

THE fact that the country is on the eve of a great coal strike seems to be perturbing no one in Congress. The mail being received by Senators and Representatives, which accurately reflects the matters which are giving concern to the public, contains little reference to the coal situation. It is evident that the public refuses to be excited about the strike. It is believed that the strike can last two or three months, if distribution is well handled, before the pinch will become sufficiently acute to bring public pressure on Congress and on the administration in sufficient volume to induce these agencies to attempt to relieve the situation. When regulation of the industry was threatened, the coal trade made unqualified claims that it was able to take care of any crisis. In the situation now facing it the coal trade will have the best opportunity of its history to show that it can handle its own affairs, including the problem of distribution.

At the time of this writing there is no sign of intervention on the part of the administration. Secretary Davis is having a good deal to say, but it is the official business of the Department of Labor to make a show at mediation. Real intervention by the administration would be indicated only when the President himself invited the representatives of the conflicting interests to confer. He is the only official whose invitation may not be declined. While the President has no legal power to compel the operators and miners to meet, custom has established the prerogative which makes his invitation tantamount to an order.

It is the consensus of opinion in Washington that the President is going to issue no such invitation prior to April 1. The circumstances surrounding the present situation are quite different from those in 1902, when President Roosevelt called the operators and the representatives of the miners into conference, and when President Wilson took similar action in the recent bituminous strike.

There is a growing belief, however, that the operators made a serious mistake in refusing to meet the miners in an interstate conference. What they have sacrificed in the way of public opinion is thought by some to more than offset any advantages that they may have gained by this refusal. In fact the only talking points the miners seem to have are the refusal of the operators to meet them in an interstate conference and the large profits alleged to be accruing to the anthracite operators.

Traffic Men Foresee 20 Per Cent Reduction in Coal Freights

Believe Large Increase in Traffic Will Be Sequel, Citing Result of Cuts in Rates on Iron and Steel and Oil

THERE is a general feeling among traffic men that the reduction in freight rates on coal may be as much as 20 per cent. This view is based largely on the unanimity of opinion as expressed at the rate-reduction hearing by witnesses representing most lines of industrial activity.

The Interstate Commerce Commission is now engaged in the onerous task of digesting the vast amount of evidence which was laid before it. Those who predicted that a decision would be forthcoming by April 1 are now willing to revise their estimate. It is not improbable that fully another month will be required by the commission to sift the evidence. There is a growing feeling that the railroads will do all they can to oppose the reductions which are likely to be ordered. This would mean at least that the thirty days' statutory notice would have to be given. In that connection it may be said that many believe that the railroads in their general attitude in this case have lost many friends, particularly by their objections to the appearance of shippers. When the railroads were turned back to the companies public opinion was with them to an extent never before attained in the history of railroads. Many think this asset has been largely frittered away.

The rate-reduction hearings continued for three months. More than a score of railroad lawyers from all sections of the country supported the railroad witnesses in their presentation of testimony intended to show that the railroads under no circumstances could stand a rate reduction at this time. Bankruptcy and receiverships were forecast for many of the carriers if rates were reduced. Nationally known railroad officials painted gloomy pictures intended to create the impression that the transportation machine is on the verge of collapse and that only one more stroke is required to paralyze it completely.

The railroads used 1921 as the basis of their calculations, which was the worst year in all railroad history. The carriers on a whole earned 3.3 per cent on their tentative valuations during 1921. They have admitted that the same tonnage handled in 1922 at the same rates and charges would earn 4.88 per cent. This allows for wage reductions already made, changes in working conditions authorized by the Railroad Labor Board, and the reduced cost of materials.

The railroads estimated the reduction in materials at 20 per cent. There is widespread belief, however, that the reduction was greater than that. In using the materials which were bought during peak prices railroad witnesses testified that they are being charged out on the high-cost basis. Shippers say that no other business in America is so protected or can fail to mark down invoices.

On the basis of probable costs in 1922 many are of the opinion that a return of 6 per cent could be made by the railroads if the tonnage were no greater than in 1921.

Throughout the hearing the railroads contended that reduced rates would not cause an increase in traffic. This was in the face of figures that rate reductions already had stimulated certain classes of traffic. Iron and steel export rates were reduced 25 per cent last August. An increase began at once in movement, which rose from 73,000 tons in August to 135,000 in December. Export rates on oil also were reduced. One large refinery in the mid-continent field had an increase ranging from 1,500 to 2,000 cars per month.

There is a quite general belief that the railroads are not willing to do their part of the deflating. Their labor costs have been reduced several hundred millions of dollars, but less than one-half of the saving accruing from that source has been translated into rate reductions. On the other hand, there is general faith in the Interstate Commerce Commission. Even though the transportation law has placed it in an embarrassing position by requiring it to act as guardian for the railroads, there is confidence that a decision in this important case will be an intelligent and equitable one.

Illinois Mine Hoists 7,214 Tons in a Day

THE world's record for a single day's output has been broken again. This time the Bell & Zoller Mine No. 1 at Ziegler, Ill., takes the palm. On March 9 the mine hoisted 7,214 tons. When this mine was sunk in 1903 by Joseph Leiter, top works were constructed of a size previously unheard of, for Mr. Leiter had taken a long look into the future and prophesied that within the life of those buildings that mine was going to be producing 5,000 tons a day.

See Prices Up Until Strike Is 90 Days Old; Then——

Nine Chicago Operators Only Thus Far in Agreement Runaway Market Unlikely—"I Don't Know" Is Customary Statement

"PRICES of coal during the coming strike? Well, if the strike runs past the 30-day mark, and it doubtless will, prices will take an upturn and keep on climbing until they double at the end of, say, 90 days. After that——"

If the ideas of nine coal operators in Chicago were trimmed down to only those few points on which they agree, and then put into words, the first paragraph of this article would be the result. The nine men—operators in various fields both east and west, running union as well as non-union mines—differ widely as to what should fill the blank at the end of that paragraph. They differ just as coal men are differing on almost every hazard they make nowadays. Practically the only statement they will agree upon from first word to last, day or night, Sunday and holidays not excepted, is: "I don't know." Casual visitors hear it. Customers asking for advice hear it. Even the coal men talking among themselves fall back upon it. Never was there such a period of "dumb-bellism" in the coal business.

It is pretty well agreed among coal men, however, even outside the nine operators here quoted, that prices must ascend during the coming summer until a general settlement with the miners on the wage question is effected. The ascent should not cause a runaway market—at least not during the first 90 days of the strike. After that——

EVIDENCES OF INDUSTRIAL REVIVAL SEEN

While demand is dead at this exact moment there are signs of a coming gentle revival to be noted in the middle Western region. The malleable iron industry all over this region is awakening after a long hibernation. A number of important railroad contracts for castings of various sorts have been let. Car builders are getting ready to handle some business that has fallen to them. There is a little steel business abroad in the locality around the lakes. Farm-machinery makers are beginning to feel the anticipated spring demand, now that the farmer is getting a better return on his grain, the automobile plants are feeling a faint urge and the brick and tile industry is fast coming to life for its summer run. So the Chicago coal men anticipate a thin trickle of demand for fuel during the spring which possibly might develop a little, though no freshet is in prospect.

With that slight freshening of demand evidencing itself probably soon after the strike takes effect April 1, it remains to be seen whether the non-union flow of coal from active mines will be heavy enough. Stocks on the docks and in the hands of railroads and large public utilities are considerable. They will absorb almost any shock that might—by some industrial miracle—register during April and early May. But if the entire union army of miners is still on strike by that time, it is expected in Chicago that a certain uneasiness among big consumers will begin to develop. With that prices on the coal coming out of West Virginia will start upward slowly.

Of course such demand as there may be will be for steam sizes during the summer. Domestic coals—if there are any on the market—will lag. As soon as that becomes evident, the producing mines will quit making domestic sizes. Then, as prices lift, nothing but mine-run coal will come west. Big consumers will crush it for their own use. Smaller consumers will take it until the price begins to get stiff. Then these will close down, lessening the demand probably enough to keep prices within sight; so say most of the nine operators.

But at the end of 90 days—— "Then," said one coal man of 20 years' experience, "the top will blow off. It will be getting late in the summer and people who have to have coal will get excited. You know what that means. And I'm afraid that's what's going to happen." Some others scoffed at the idea. "Why!" they exclaim, rolling back in their chairs, "this strike can't last 90 days. I should say not! Illinois miners are ready to make a deal out here any time, and it'll be made soon after the strike starts. That splits the union. Pfft! goes your strike."

"I'm afraid," soberly remarked an operator who has mines both union and non-union, and who came up through the ranks himself, "too many operators are forgetting an old principle of wise warfare and good business: 'Don't underestimate your opponent's strength.' Miners have a high regard for their union. In some localities unionism is almost a religion with them. Believe me, they won't consciously do anything that will smash their own organization. Even the Illinois miners will be a mighty hard bunch for Farrington or anybody else to lead into a separate agreement which will damage the union. Farrington may be willing to do it, and maybe he'll succeed, but I don't think so. Not if I know miners.

"When this strike starts, we're in for a long run of it. We may say: 'Oh, these fellows can't hold out long. They've no funds. They'll soon get hungry and then it's all over.' That's what a lot of operators thought in 1905. A strike started in the spring, when miners weren't supposed to have a quarter among them. It didn't end until the next fall. They fought for five months—on nothing. You know how they do it in these mining camps: Work a day or two at odd jobs, raise garden truck, get in debt to the store, pay a dollar or two and then get another ten dollars' worth of food, work another day or two on the roads or somewhere, get another extension of credit at the store, and so on.

"The storekeeper has to keep on giving more and more credit to a man for fear of losing what that man already owes him, and if he expects to stay in that town, he knows he has to carry those miners until they get back to work. A town can't let its people starve. So the miners can hold out until their towns are completely exhausted—and they'll do it if they think they're right. They'll hold out all summer in this strike if they believe the life of their union depends upon it."

So that particular operator is inclined to believe the country is in for a long drag of it—a drag long enough to have a decided effect on prices.

SOME MINES PRODUCE IN EXCESS OF SALES

Most Illinois operators are watching the others to see what effort, if any, is made to meet the strike period. Just now some mines are producing more than they are selling. This may be in anticipation of a last-minute rush of orders. If so, and if the rush does not develop, then such mines will shut down about March 22 or 23. If this production is going on in order to get a quantity of coal above ground before April 1, to be cashed in on later, that fact, too, will be evident in the final week's output compared with sales.

"I expect about 30,000 cars of Illinois coal will be on tracks unbilled the morning of April 1" guessed an operator. "Just how long it will stand there, or what price it will eventually bring, I couldn't even surmise. A lot of it will be held on a gamble and maybe the owners, after paying demurrage a long time, will dump it on the market at almost any price in order to get rid of it. On the other hand, demand may pick up and absorb it easily. If you asked me what the wise course is for operators my answer would be, frankly, I don't know."

The Illinois Coal Operators' Association has been silent, or nearly so, on the question of what prices may be during the strike. Here is its noncommittal comment: Coal prices will, of course, be affected directly by supply. It is believed non-union collieries can readily provide 3,500,000 to 4,000,000 tons per week; probably more if full car supply and adequate transportation is available. Such tonnage with reported stocks on hand should, judged by recent demand and arrival of spring weather, protect average requirements for some considerable period without distress to the public." E. W. D.

COME, GENTLE SPRING!—With all the other bills coming in then, we hope we won't have to get some new Easter coal. —*Chicago Journal of Commerce.*

Finds Increase in Anthracite Wages Greater Than in Manufacturing Industries and on Railroads

EARNINGS of anthracite mine workers under the present agreement are from 152 to 166 per cent higher than before the war and have increased more than those of wage earners in manufacturing industries and on the railroads, according to an investigation just completed by the National Industrial Conference Board, 10 East Thirty-ninth Street, New York City. The board's canvass also revealed that the working hours and employment had remained fairly steady. The board has just announced the general results of its study of conditions in the anthracite industry.

"This investigation," it was said at the offices of the board, "is the most comprehensive study ever made of conditions in the anthracite industry. It covers fifty-five companies, with 94,514 wage earners, operating 179 collieries, of which the total production in 1920 was 64,548,928 tons, or about 91 per cent of the entire production of the industry. The period covered is from the last half of June, 1914, to the last half of October, 1921, and the results show conditions as to earnings, hours of work and employment in a representative period under the agreement of 1912-1916, as compared with a representative period under that of 1920-1921, which expires March 31, and the renewal of which the operators and workers have just met to discuss. The investigation covered the same companies during the entire period. All classes of wage earners in the industry are included except clerks and executives, contract miners' helpers and workers who missed more than two days of the full working time in any semi-monthly period.

"The investigation shows that the average hourly earnings of all wage earners were 27.8c. in June, 1914, and rose to 72.8c. in October, 1921, an increase of 162 per cent. Excluding contract miners, who are paid on a different basis from ordinary workers and whose earnings tend to swell the average, this increase is from 22.5c. to 59.9c., or 166 per cent. The average actual earnings of all wage earners in the semi-monthly period in the last half of June, 1914, were $29.81, and rose to $75.18 in October, 1921, an increase of 152 per cent. On this basis the weekly earnings of all wage earners rose from $13.76 in 1914 to $34.71 in October, 1921.

WORKING HOURS DECLINE ONLY SLIGHTLY

"During this period the average hours worked in a semi-monthly period for all wage earners declined from 107.4 to 103.3. Excluding contract miners, the decline was from 115.1 hours in 1914 to 111.9 hours in October, 1921. The total number of workers employed showed practically no change during the entire period. The number of breaker starts per colliery, which serves directly to indicate the amount of mine activity and therefore the opportunity for employment, were 11.6 in June, 1914, rose to 12.5 in June, 1921, and declined to 11.8 in October, 1921. In short, employment in the anthracite industry has been fairly regular throughout the entire period.

"Comparing changes in actual earnings with changes in cost of living during the period covered, the investigation shows that real hourly earnings of all wage earners in October, 1921, were 60 per cent above those in June, 1914. Excluding contract miners, the increase was 62 per cent during this period. Real weekly earnings in October, 1921, were 54 per cent higher than those in June, 1914.

"A comparison of the average actual hourly earnings in the anthracite industry with those of wage earners in manufacturing and on railroads, as set forth in previous reports of the Conference Board, shows that while actual hourly earnings of anthracite workers were lower than those of industrial and railroad workers in 1914 they were higher in 1921 than those of the other two groups. The percentage of increase in actual hourly earnings for industrial workers from July, 1914, to July, 1921, was 113 per cent; for railroad workers up to Oct. 1, 1921, 131 per cent, and for anthracite workers, 168 per cent. By July, 1921, the average weekly earnings of workers in manufacturing industries were only 83 per cent above 1914, those in railroad work in October, 1921, 102 per cent, while in anthracite mining the increase was 152 per cent.

"The average actual hours worked per week by wage earners in manufacturing industries in 1914 were 51.3 as compared with 44 hours in July, 1921; those in the railroad industry were 59.7 in 1914 as compared with 52.2 in October, 1921; while the average hours per week for all workers excluding contract miners in the anthracite industry were 53.1 in 1914 and 51.7 hours in October, 1921.

"A comparison between representative periods from July, 1914, to October, 1921, shows that while employment has increased 21 per cent on the railroads, and declined 8 per cent in manufacturing industries, it has remained at practically the same level in anthracite coal mining.

"Up to October, 1921, real hourly earnings in the anthracite industry have increased 60 per cent, as compared with an increase of 41 per cent for railroad workers and of 32 per cent for industrial workers up to July, 1921. Real weekly earnings in the anthracite industry have increased 54 per cent as compared with 23 per cent for railroad workers and 13 per cent for workers in manufacturing industries generally.

PAY INCREASE TOPS OTHER INDUSTRIES

"In these comparisons the figures for workers in manufacturing industries go down only to July, 1921. Later data would make the contrast even more striking because of the continued decline in wages in manufacturing industries, while wages of anthracite workers, fixed under the 1920-22 agreement, have remained constant.

"The disproportionate increase in wages in the anthracite industry as compared with changes in manufacturing wages and railroad wages, is shown particularly when the changes in earnings of common outside labor in the anthracite industry are compared with those of common labor on class I railroads and with those of common or unskilled labor in manufacturing industries. The increase in hourly earning of common labor in manufacturing industries from July, 1914, to July, 1921, was 117 per cent; from June, 1914, through October, 1921, those of railroad workers rose 138 per cent and those of outside common labor in anthracite mining 89 per cent. During these periods the increase in actual weekly earnings for common labor in manufacturing industries were 85 per cent for common labor on railroads, 99 per cent and for common outside labor in anthracite mining 189 per cent.

"Comparing these changes with changes in the cost of living during these periods, the real hourly earnings of common labor in manufacturing increased 34 per cent; on railroads, 45 per cent; in anthracite mining, 77 per cent. Real weekly earnings of common industrial labor increased 14 per cent; common railroad labor, 22 per cent, and common outside mining labor, 77 per cent.

"The average hours worked per week declined 8 hours for common industrial labor, 9.6 hours for common railroad labor, while those of common outside anthracite mining labor increased 0.2 hour."

In considering adjustments in the anthracite mining industry, the following factors must be taken into account:

"1. The wage increases since 1914 have been very extensive.

"2. There has been no wage reduction in the depression period.

"3. The increases for surface labor have been far above those for underground workers in more hazardous occupations.

"4. The increases have been greater for the unskilled worker and the day worker than for the skilled laborer and the man who works on a contract or tonnage basis.

"5. The constant demand for anthracite as domestic fuel has maintained employment and hours of work at a practically uniform level."

Cost of Producing and Shipping Coal, Says McAuliffe, Must Come Down

IF the union bituminous and anthracite mines north of the Ohio and Potomac rivers close on April 1, the psychological effect on all industry will be other than beneficial, according to Eugene McAuliffe, in an address delivered March 1 before the Associated Engineering Societies of St. Louis. Outlining the elements that enter into the production of coal, Mr. McAuliffe stated what, in his opinion, were the salient features of the bituminous coal situation, as disclosed in part in the following paragraphs.

The cost of producing and transporting coal must come down. As the capital goods or savings invested in the industry are fixed in quantity, it remains for the directing force to get more out of the investment. To do this calls for an increased measure of efficiency in mine management; the problem offers difficulties, but they are not insurmountable. Much has been done in the way of installing larger units. The installation of mining machines, power haulage in place of animal haulage and the equipment that makes the mining and preparation of cleaner and better coal possible represent great strides toward betterment.

The loading of the coal at the face, which work now absorbs approximately 70 per cent of the total mining cost, must yield to mechanical loading machines, which are now loading lead ore in the southeastern Missouri lead belt for 15c. per ton. Such machines are being developed rapidly. They are in fact just around the turn and would be here now doing their part toward the amelioration of labor if it were not for the opposition of labor itself.

OPERATOR SHOULD CONTROL DRILLING AND FIRING

The drilling for and firing of explosives, a work now divided between hundreds of men in the larger producing mines, should be taken over by the operator, who could quickly develop a few skilled men who, equipped with portable power drills, would not only reduce the labor and cost of this feature of mine work but in addition, reduce the percentage of fine coal now made, improve the quality of all coal produced, and, further, add immeasurably to the safety of mine work. That 60 per cent of the men working underground handle, store and make use of high explosives as well as the sensitive fulminating caps employed to detonate them—these men frequently untrained, many of whom do not speak the English language—represents a condition that should not be allowed to continue.

One of the major responsibilities that attach to the owners of coal properties is that of building up an official mine staff which must be divorced from the working force. Unfortunately these men, usually honest, ambitious and industrious, frequently suffer not only from the tradition of years of work at the mine face but, due to the instability of the industry, hesitate to separate themselves permanently from the status of workmen, compelled as they are at times to go back to the ranks to obtain a livelihood. Broadly speaking, the mine staff or that portion which comes in immediate contact with the mine labor feels more closely related to it than it does to the capital investment.

The item of supplies, in Mr. McAuliffe's opinion, is one that must be studied carefully by all operating heads. Many large operations fail to maintain store supply accounts, simply charging to the current month's expense the invoice cost plus freight of each item billed for, regardless of the month in which it is used. The inside of a coal mine offers vicious opportunity for the waste of rails, fastenings (including spikes and bolts), copper, machine and motor supplies as well as timber.

Many of the items that bulk large in capital and operating costs have, like the union mine workers, refused to deflate their war and post-war prices. The makers of mine locomotives, mining machines and necessary repair parts are particular offenders. John Sherman years ago said "the way to resume is to resume"; likewise the way to deflate is to deflate. Every single interest that refuses to join in the work of deflation should be singled out and brought into line. The cost of power, whether steam or electric, whether made or purchased, should receive special study and attention.

With 67.8 per cent of the cost of production paid for mine labor, that element of cost also must be revised, Mr. McAuliffe said. The officers of the United Mine Workers hold that this one industry must either insure full working time to all who gain foothold therein, regardless of the fluctuations in demand for coal made by the consumer, or otherwise pay a unit wage sufficiently high on such days that work is available (and the individual cares to work) to provide the standard of living they desire. There are today 150,000 men depending on the industry over and above those needed to supply the demand, an army equal to 30 per cent of the nation's mine working force. It would be just as reasonable to charge the railroads with the duty of maintaining on their payrolls the 446,550 laid off in that industry between September, 1920, and the same month of 1921 and to demand that the agricultural, steel, lumber, metal mining and general manufacturing industries carry the hundreds of thousands of men laid off by them at a time when, due to industrial depression, a market for the product of these men was unavailable.

There is nothing extraordinary in the attitude of the delegates who endorsed the impossible program of the 6-hour day and 5-day week; they are merely echoing the illogical teaching of their paid organizers, who find it pays them to use the vast sums which are collected at the source to in this way perpetuate their own positions. Until the system that underlies the conduct of this organization is "dry cleaned" and "pressed" it will remain impossible for a sane constructive leader to bring this army of men potentially sound, into a livable atmosphere.

The industry is a vital and fundamental one and its workers should receive good, fair wages, but the problem of caring for the fluctuations in volume of business between years of activity and depression is one that cannot be cured by excessively high wage rates. The wages paid mine workers today in the union fields run from 100 to 250 per cent above those paid in the non-union fields, the one representing an excessive wage that is strangling all industry, while the other extreme suggests a wage too low to maintain even the most conscientious worker—neither condition such as to best serve the nation's welfare. I have a definite feeling that unduly depressed wages are even less defensible than those which are inordinately inflated. Whenever wages are considered, the offense of voluntary absenteeism from work exceeding 10 per cent, which is common to the mine worker, must not be lost sight of.

STRESSES EVILS OF ABSENTEEISM

Mine workers as a class absolutely refuse to recognize their responsibility to the industry. Absenteeism represents a condition that has grown up gradually; it is an uncontrolled privilege suffered by no other industry. The first duty imposed on the mine staff after starting time in the morning is that of seeking substitutes for absent workers at what might be called "key" positions—motormen, tripriders, machinemen, etc., who are essential to the creation and movement of the tonnage that the loaders place in the pit cars. This situation tends to reduce the day's output, increases the unit cost and multiplies the hazards that are attached to mining.

Under the contract the mine worker cannot be approached on the question of absenteeism providing he reports on alternate days on which the mine works; that is to say, if he is absent Monday, he may return Tuesday, absenting himself on Wednesday, and so on, this without even the formality of an excuse.

To this must be added the loss sustained from indifferent services rendered in certain important positions by leaders who resent being drafted for emergency service as motormen, machinemen, etc. Further, and unlike any other form of unskilled labor, the loaders, who approximate 60 per cent of the mine force, begin leaving the mine at the end of the fifth hour, continuing to straggle out thereafter, so that it is probable that the working day of this class of labor does not average more than six and one-half hours.

The annual turnover due to the migratory and shifting habits of mine workers represents an economic loss in excess of that suffered by any other form of industry. There are some splendid men in our mines in Illinois; that is evidenced by the fact that approximately 35 per cent of the men on the payroll earn 50 to 75 per cent of the wages paid during each two-weeks period. This better element, however, is dominated and overrun by the irresponsible minority, who vociferously exploit the "rights of labor."

At the foundation of the abuses that surround the mine workers' union, Mr. McAuliffe stated, lies the much discussed check-off. Years ago certain operators agreed to collect at the source certain special assessments levied for sick benefit and funeral purposes. From this modest beginning the abuse has grown until the tax levied on mine workers, and through them on the consumers of coal, runs into millions of dollars annually. This tax, amounting frequently to more than 6c. per ton of coal produced, is used to build up and maintain the machine that in the autumn of 1919 defied all three branches of our national government—executive, judicial and legislative.

When a man seeks employment in a union mine his "card" is demanded and if he is unable to show membership he is compelled to sign an order authorizing his employer to check off an initiation fee ranging from $5 to $50. When the amount exceeds $10 the victim is graciously allowed the privilege of the installment plan, these payments taking precedence over orders given to purchase necessary food and clothing. "I recall a case where the son of a coal mine owner, who was then an engineering student, was compelled to sign up for a fifty-dollar check-off in order to enter his father's mine during vacation as an assistant to the mine surveyor. This method is used to collect funds to fight neighboring operators in the immediate vicinity, or in other states. I further recall where an operator producing coal in two states, checked off dues in one state to be used against him where his men were on a strike in another state.

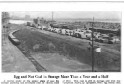
"I have before this expressed my belief in the theory of collective bargaining," continued Mr. McAuliffe. "I am in favor of unions soundly constructed and honestly administered. All unions should be forced to incorporate and should be subject to all of the laws, rules and regulations that govern corporate or partnership holdings of capital goods or accumulated savings, including the payment of federal income and excess profits taxes. All malicious interference with the operation of a mining property by its labor should be eliminated."

The consumer, a most important element in the coal industry, must assert himself, if the troubles that continuously beset it are to be remedied. Both coal operators and miners are opposed to the collection and publication of the facts that surround the production and sale of coal. This attitude is a mistaken one, very largely engendered by the legal advisers of the operators and as a matter of course opposed by the oligarchy which controls the union. Surely we can trust our national government to collect and publish reliable data covering this vital industry. No one today questions the integrity of the statistics collected by the government covering the operation of the railroads. "I will quote Secretary Hoover, who on Feb. 3 last, when speaking on the railroad situation, said:

"'We are struggling with the great problem of maintaining public control of monopoly, at the same time maintaining the initiative of private enterprise. I believe that we are steadily progressing to solution.

"'Great social and economic problems find their solution slowly and by a process of trial and error. We have tried unregulated monopoly, and have tried government operation, and found the error in them.'

"Given all the facts we can chart a course that will insure fair sailing for each and all of the four elements that go to make up the coal industry."



Egg and Nut Coal in Storage More Than a Year and a Half

A careful study of the proper sizes of coal for storage purposes has developed that of Illinois coals the size that will stand up best is not the large lump, which usually is given preference by coal retailers.

For the purpose of ascertaining which size would stand up best for domestic purposes in storage, the Union Electric Light & Power Co. laid down in its storage yards on Salisbury Street near the McKinley Bridge, in St. Louis, a large pile of egg and nut coal from Dowell, Ill. This was in the spring and summer of 1920. This coal is still in storage and with few exceptions shows up unusually well, far better than some storage piles of 6-in. lump. Thousands of people daily have seen this pile of coal and it has been watched by retail coal dealers from both Missouri and Illinois, with the result that they have decided that there is a smaller percentage of loss and breakage with these sizes in storage, without any danger of fire, than with either mine-run or lump.—E. J. Wallace, St. Louis, Mo.

Hultman Recommends Scientific Study of Domestic Fuel; Champions Bituminous

EUGENE C. HULTMAN, Fuel Administrator of Massachusetts, on March 14, 1922, appeared before the joint committee on mercantile affairs of the Massachusetts Legislature with the recommendation that the Massachusetts Institute of Technology conduct a scientific research as to the most economical domestic fuel and its efficient use.

Some of the points brought out by Mr. Hultman follow:

The bill paid by the householders of Massachusetts for anthracite this season will be about $80,000,000. If the best grade of smokeless bituminous coal had been used for domestic purposes, they would have saved approximately $40,000,000 on their domestic coal bill this year.

The anthracite situation is the source of increasing hardship to the families of Massachusetts on account of excessive prices, labor difficulties and extremely poor quality of the coal. There is no likelihood of permanent relief, except through the development of a fuel to compete with anthracite for domestic needs.

Many engineers and geologists claim that the anthracite region has reached its maximum production, due to limited deposits of coal; others advance the argument that production is artificially controlled through an understanding among the operators. In either case, the fact remains that as long as the people of Massachusetts allow themselves to depend upon anthracite for their domestic requirements they will have to pay the price demanded by those mining it, as well as such tax as the State of Pennsylvania may impose.

Therefore, the special commission on the necessaries of life recommended in its report to the General Court that the Legislature appropriate the sum of $10,000 a year for a period of three years, to be expended through the division of industrial co-operation and research, Massachusetts Institute of Technology, to study and report annually upon:

(1) The substitution of bituminous coal, the supply of which is practically inexhaustible, for anthracite. The prepared sizes of bituminous coal have been used by householders of the West and Middle West for many years.

(2) The compilation, classification and simplification of instructions for burning fuel in small heating units, such as are commonly used in dwellings.

(3) The compilation and simplification, for use of the layman, of methods and means which may be adopted for cutting down the loss of heat through walls and windows. It should deal with recommendations for building of new houses with proper stops, interlinings, air spaces, etc., and with the question of proper construction of window panes and sashes, and use of double glazing to prevent heat loss.

Mr. Hultman summarized the principal advantages and disadvantages of anthracite and bituminous coal as a household fuel. The advantages of anthracite are: cleanliness, little smoke, easy control of fire and steady heat, while its recognized disadvantages are high price, monopolistic source of supply, slow response to change of drafts, and high slate and ash content.

On the other hand, the advantages of bituminous coal are low price, competitive sources of supply, quick response to change of drafts, low percentage of inert matter and high heat value, as compared with the disadvantages of being dirty to handle, making more smoke and more attention to fire and furnace being necessary.

Anthracite, he stated, is a luxury at its present price compared with the prices of other fuels. It is an established economic fact that money spent for luxuries which add greatly to the standard or comfort of living is well spent, if the individual or community can afford it; on the other hand, money spent for luxuries without a commensurate return is the worst form of economic waste.

"There is colossal ignorance of and unreasonable prejudice against soft coal on the part of most householders. Folkways are difficult to change, and our habit of using anthracite has been carefully nurtured by those who would lose money if we should use any other fuel. While people will exclaim that soft coal cannot be used in the household, upon questioning they will admit that their opinion is based upon what someone has told them or on an impractical experiment in 1902. At that time the difference in price between the two coals was not as great, or the facts in regard to anthracite supply not as well known, as at present; so that those who used bituminous coal regarded it entirely as a stop-gap fuel, and made little or no attempt to study the best methods of combustion."

According to the U. S. Geological Survey, over one-half of the domestic consumption of the United States in 1917 was bituminous. The total consumption was 106,500,000 tons, of which 49,400,000 tons (46 per cent) was anthracite and 57,100,000 tons (54 per cent) was bituminous. With low-volatile or smokeless bituminous coal properly burned there is but little more smoke than with anthracite. The ash content is 50 per cent lower and the heat unit value is nearly 20 per cent greater than in anthracite.

"The low-volatile bituminous coal regions available to this market," he said, "supply the finest coals in the world, and the only problem we have to solve in order to have a high-grade fuel to compete with anthracite is that of combustion. The Massachusetts Institute of Technology has assisted our manufacturers for years in their problems of combustion. The people of our Commonwealth can employ the service of the Institute of Technology to work out these problems at a cost of about one-fifth of a cent per ton on the present consumption rate of anthracite coal."

Byproduct Coke Produced and Sold or Used by Producers in the United States, 1920, by States and Kinds*

(In Net Tons)

	Production a		Sales								Used by Producer	
			Furnace		Foundry		Domestic and Other		Screenings and Breeze			
State	Coke	Screenings and Breeze	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Coke	Screenings and Breeze
Alabama	3,123,890	206,847	228,798	$1,890,345	27,514	$301,000	21,300	$115,428	40,053	$74,035	2,836,509	163,116
Illinois	2,136,793	197,746	387,790	5,008,243	216,537	3,040,733	267,755	2,479,078	103,208	211,686	1,259,168	118,186
Indiana	4,553,697	326,546	180,718	2,120,703	196,208	2,667,306	385,842	3,083,628	37,100	64,520	3,840,900	292,454
Kentucky	466,985	42,283	364,266	2,623,676	44,098	501,462	64,278	534,466	42,283	27,265	....	....
Maryland	682,132	50,360	7,437	(b)	....	....	....	....	2,520	(b)	678,989	59,255
Massachusetts	488,089	33,150	....	....	355,365	(b)	132,410	(b)	50,629	(b)	....	....
Michigan	1,393,445	92,388	291,793	3,227,253	400,696	5,553,922	448,752	4,107,026	20,524	41,168	282,799	17,902
Minnesota	674,801	45,504	106,085	1,127,699	57,229	744,511	163,765	1,719,202	8,884	23,077	360,806	42,730
New Jersey	725,571	72,330	453,831	(b)	95,164	(b)	221,837	(b)	23,841	(b)	10,683	49,213
New York	1,040,192	38,980	297,628	3,471,321	8,036	99,003	90,220	1,022,880	35,102	113,999	639,445	20,613
Ohio	5,614,877	423,887	651,654	6,547,341	632	4,418	169,216	1,135,150	142,586	209,542	4,783,002	268,285
Pennsylvania	7,730,256	777,027	544,152	6,291,166	....	....	173,763	941,250	32,743	38,935	7,100,823	492,586
Tennessee	139,121	5,141	98,677	900,300	39,702	460,490	....	....	3,126	1,274	....	....
Washington	26,284	6,014	1,057	10,993	....	....	....	....	85	276	23,344	5,929
West Virginia	447,392	7,512	36,348	397,569	....	....	9,110	70,989	100	200	344,957	37,677
Combined States: Colorado Missouri Rhode Island Wisconsin	1,590,426	135,120	404,730	9,224,613c	274,701	10,305,380d	213,489	5,871,331d	20,235	443,027e	687,036	124,240
Total United States	30,833,951	2,460,835	4,054,964	$42,841,222	1,715,882	$23,678,225	2,361,737	$21,080,429	563,019	$1,249,004	22,848,461	1,692,186

*As reported by the U. S. Geological Survey

(a) The total value of production, based on the average of sales, amounted to: Coke, $313,028,732; screenings, $4,434,818. (b) Included with combined States.

(c) Includes also value of Maryland and New Jersey furnace coke. (d) Includes also value of Massachusetts and New Jersey foundry and domestic coke. (e) Includes also value of Maryland, Massachusetts and New Jersey screenings.

Fairmont Reported to Be Ready to Compromise; Lewis Firm for Negotiation on Central Field Basis

ALL likelihood of a Central Competitive Field conference having faded, the centers of interest in the impending wage conflict in the soft-coal fields have shifted to the outlying fields. Among these the situation in the Fairmont region of northern West Virginia, for the time being, is the most significant. It is reported that the largest operator in this district on March 11 suggested to a joint conference of operators and miners at Fairmont that they jointly proceed to negotiate a scale without reference to what may or may not be done in the Central Competitive Field and intimated that the check-off is of minor importance. This is held by those in touch with the situation nationally to mean that the Fairmont field is preparing to concede the check-off for a scale and is cited as the first important recession from announced policy of elimination of the check-off.

It is pointed out that the real opponents of the check-off among the operators are now narrowed down to the Pittsburg Coal Producers Association, the Southern Ohio Coal Operators, the Central Coal Association, which represents a minority in central Pennsylvania, and the Kanawha operators. These groups, it is emphasized, are not so located as to insure their being able to hold out indefinitely should they alone attempt to make the elimination of the check-off a real issue.

In nearly every union soft-coal field the operators have attempted to open negotiations with the local union. Illinois producers now have the promise of Frank Farrington, district president of the union, to meet them prior to April 1, providing John Lewis, international president, has not in the meantime brought about an interstate conference. In the Southwest the two sides have had a preliminary conference and in Fairmont there is said to be prospect of early negotiations looking toward a new contract. Elsewhere there is no present indication of other than a suspension without even a preliminary canter. The Lewis forces are holding firm to his policy of no action save through a basic wage scale in the Central field. Even Mr. Brophy, who supported Farrington at Indianapolis last month, is following Mr. Lewis' lead in this.

While Secretary Davis was in New York on March 15, looking in on the anthracite wage conference, a statement was given out at his department in Washington summarizing the positions taken by the operators in the Central Competitive Field. This statement, given out March 17, follows:

PROPOSED PRELIMINARY JOINT CONFERENCE OF COAL OPERATORS AND MINERS REPRESENTING WESTERN PENNSYLVANIA, OHIO, INDIANA AND ILLINOIS, KNOWN AS THE CENTRAL COMPETITIVE STATES

Obligation:—Resolved, that an interstate joint conference be held prior to April 1, 1922; the time and place of holding such meeting is referred to a committee of two operators and two miners from each state herein represented, together with the International officers of the United Mine Workers' organization.

Status of Negotiations on March 17, 1911.—President John L. Lewis invited the operators to meet as per above resolution, in Pittsburgh, Jan. 6, 1922, but withdrew the call later because of unsatisfactory replies, which indicated that a full attendance could not be secured. A second call was issued by Mr. Lewis for March 2, 1922, but with the same unsatisfactory results.

The Secretary of Labor, at the request of the President, Feb. 24, 1922, took up the question of securing the desired conference with the following results:

The Pittsburgh Coal Producers Association positively declined to join in the renewal of the Central Competitive states agreement; therefore attendance at agreed conference deemed useless so far as they are concerned; but will meet with their own miners to negotiate an agreement without the check off.

The Pittsburgh operators have posted a wage scale, effective April 1, which calls for a reduction of 35 to 40 per cent.

Pittsburgh & West Virginia Railway Coal Operators Association and Panhandle Coal Operators Association request the right of representation in any Central Competitive states conference, although they had not been included in the previous conferences of said states.

The Southern Ohio Coal Operators Association decline to join in any interstate agreement but will meet their own employees to negotiate one. They were parties to all previous Central Competitive states agreements. They contend that the miners' claims in excess of the Bituminous Commission's award as per agreement of March 31, 1920, disrupted the interstate movement, and that the methods of arriving at the interstate wage agreement have been challenged in the federal courts as violation of the Sherman anti-trust law. They have also posted a wage scale effective April 1, similar to Pittsburgh.

The Eastern Ohio Coal Operators Association at first declined to join in any interstate wage agreement for same reasons as Pittsburgh. They later agreed to attend March 2 meeting if operators of all four states attended. Five prominent coal operators of this association suggest a joint conference of all union mines in the United States. The Central Ohio Coal Operators Association also suggests a national joint conference of the entire industry or especially of the union mines.

The No. 8 Ohio Coal Operators protest against a Central Competitive states meeting, but are willing to meet representatives of their employees and their union officers to negotiate their own scale. They object to eastern Ohio operators making their scale same as in the past, as they produce 40 per cent to eastern Ohio's 60 per cent tonnage of the district. They ask aid of the department to secure the desired local conference.

The Indiana Coal Operators Association accepted the invitation of first called meeting Jan. 6, also to the meeting called March 2, but this second acceptance was qualified by an expression of futility of such a conference after the declaration of miners' policy and demands framed at their Indianapolis conference, Feb. 6, and that they could not seriously consider same nor agree to meet in conference for such a purpose.

The Illinois Coal Operators Association, the Operators Association of 5th and 9th Districts, and the Central Illinois Coal Operators Association, representing the whole State of Illinois, are ready to attend any conference of the Central Competitive states without any qualifications and request a conference with the representatives of their own employees and state officials of the United Mine Workers if President Lewis fails to secure a conference of the four Central Competitive states before March 31. President Farrington for the Illinois miners protests the appointment of any federal commission in the case, as he is confident that he can secure a settlement for Illinois.

On March 16 the Federal Council of the Churches of Christ in America issued a statement to the public press appealing to the mine workers and coal operators to settle their differences through conferences and that both parties "recognize that the establishment of right human relations takes precedence over any economic issue." The statement lays particular stress on the clause in the present contract calling for a conference prior to April 1 and says: "The mere existence of this pledge of honor is sufficient to overrule all objections to conference."

AMERICAN FEDERATION ASSURES SUPPORT

Come what may, the American Federation of Labor is with the mine workers of America in their struggle against the mine owners, according to a statement issued on March 16 by that organization.

"No group of employers in any industrial controversy in this country has ever placed itself in a more indefensible position than that occupied by the mine owners at this time. Bound by a solemn agreement to confer with the workers upon the terms of a new agreement, they have refused to abide by the terms of their own pledge," the statement continues, and concludes:

"The cause of the miners is just, and in that just cause they will have the united and unswerving support of the great labor movement of our country."

District No. 2 of the United Mine Workers of America, meeting at Du Bois, Pa., on March 10, called on the public to join with the miners in demanding through federal action the facts of "the hopelessly messed coal industry." The convention declared in the call that the coal grievances of the public grew out of the same causes as the miners' grievances, and urged that the government publish all the facts as the first step in a fundamental organization of the industry. The convention declared that the necessity of public ownership of coal mines and the economic and human wastes of private ownership had been demonstrated, and it congratulated the national convention of the union for setting up the nationalization research committee to "transform the miners' policy of nationalization from a vague aspiration into a fighting program."

The Kanawha operators on March 16 announced their decision to postpone until March 27 further consideration of a new wage scale. On that date their board of directors will meet and on March 29 will give its decision to the membership. The invitation of this association to the miners' union to meet on or before March 11 brought no response from the miners.

Farrington Agrees to Meet Illinois Operators Before March 31

Message to Producers Indicates Intention to Stick to Union as Long as Possible—Wants No U. S. Coal Board

By E. W. Davidson

THE Middle West spent the past week progressing calmly seven days closer to a general mine strike on April 1, with the market stagnant, production rolling along at about 50 per cent of normal and with no more interesting event in the labor field than the sending of two messages by Frank Farrington, president of the Illinois miners and potential leader of a rebellion in the United Mine Workers of America. He replied to the Illinois Coal Operators Association that even though it is too late to prevent a strike he would meet them in separate wage negotiations some time between now and March 31, after the Mine Workers' last hope for a four-state conference has been shattered, and he wired Secretary of Labor Davis that Illinois miners hope the government will let miners and operators settle their own differences.

The tone Mr. Farrington adopted in his message to the operators lacks cocksureness and indicates that the Illinois king of miners may be having some trouble holding his own forces in line behind him. Mr. Farrington, in failing to go at once into a wage conference in the face of the wishes of union headquarters, gives the appearance of having encountered some obstacle. Judging by his tone, he is trying now to make it plain that he is going to stick to the union as long as possible. But it is evident he is willing to meet the operators and hopes to keep them in a friendly mood until he can do it.

The significant part of Farrington's March 15 message to the Illinois Operators Association, which had urged him to hurry and decide whether to meet them, runs:

> Our district executive board has directed me to say to you that in their opinion President Lewis still has a lingering hope that the miners and operators in the Central Competitive Field will be brought together in wage scale conference through government influence and that a four-state agreement will eventuate therefrom. Naturally we are anxious to co-operate with President Lewis to the end that an interstate agreement may be consummated and consequently we do not want to do anything that might hamper him in his efforts to bring about an interstate conference, therefore we earnestly urge that the Illinois operators relieve us at this time of the necessity of definitely stating the date upon which we shall meet them in district wage scale conference. However, should developments make it apparent that an interstate wage scale conference is not to be held previous to March 31, we assure you that we shall enter into district wage scale negotiations on some date previous to March 31, as provided for in the thirty-second section of our state agreement.

The message of March 15 from Farrington to Secretary Davis opposing the appointment of a government commission to settle the present difficulty between miners and operators gives the impression that Illinois miners thought mine-union headquarters were trying to get such a commission created.

The only other public action in the labor trouble taken west of Ohio was the telegram of the Southwest Coal Operators Association to Secretary Davis at Washington March 13 protesting vigorously against governmental action looking toward a four-state wage conference.

Thus, so far as the Middle West is concerned, the deadlock between miners and operators remains in that well known condition, *status quo*.

Railroads Heard in Probe of Bunker Rates

THE Interstate Commerce Commission on Monday, March 20, began an investigation of bunker coal rates to determine whether the railroads should make the rates on bunker coal lower than those on coal used locally in the ports. The railroads were represented by C. A. Cochran of the Baltimore & Ohio; E. B. Hotchkiss, for the Chesapeake & Ohio, and Walter Thayer for the Pennsylvania.

The commission is faced with a provision of law which says that the rates cannot be based on the use to which the coal is put. Notwithstanding this, both the carriers and shippers contend that it is not a violation of law to make rates for bunker purposes lower than rates for local purposes at port.

Representatives of the railroads only were heard on Monday. They said that they make one rate for coal to be delivered at side tracks at ports (line trade), another for coal to be shipped by vessel to destination inside the Virginia Capes and another for coal to be sent beyond the Capes, none of which is dependent upon the use to which the coal is to be put. They asserted that on coal for local ports the railroads performed more service than for delivery to ships and that the coal for ports should bear a higher rate than the coal for bunkers.

The investigation is being conducted by W. P. Bartel, an examiner for the commission, who stated that it had ruled in the New Orleans case that lower rates on bunker coal were unlawful because they were less than rates on coal for local delivery. It was said, however, that as the railroads do not publish cargo coal rates to New Orleans, the situation is different from that at North Atlantic ports.

Morrow Letter Says Lewis Misquoted Price Evidence Before Commerce Commission

IN a letter to John L. Lewis, president of the United Mine Workers' of America, under date of March 11, J. D. A. Morrow, vice-president of the National Coal Association, directs attention to a misquotation of his evidence before the Interstate Commerce Commission in urging freight rate reductions on coal last January, as embraced in a statement sent out by the United Mine Workers' of America last week.

In his letter Mr. Morrow says that the United Mine Workers' statement, which has been sent out broadcast, gave an entirely erroneous impression, in making him appear to have said that while the miner was paid $1.97 per ton for mining coal the coal itself was selling at an average of $10.41 per ton.

In his letter Mr. Morrow says:

"I know you wish to quote sworn testimony accurately and, therefore, wish to advise you that I made no statement that the average selling price of bituminous coal in the United States in October, 1921, was $10.41 per ton. The exhibit filed with the Interstate Commerce Commission, which represents the only information on this subject in our possession or given to the commission or anyone else, showed that the average price of bituminous coal f.o.b. the mines, run-of-mine basis, for the seven months April to October, 1921, was $2.89, and that the miners received 67.8 per cent, or $1.97 per ton, out of the total cost of $2.91 for producing that coal. The figures for the month of October, 1921, were: Average amount received per ton, $2.73, and average total cost per ton, $2.59. The same exhibit shows that in the month of November the average amount received was $2.67, and the average cost of producing the coal was $2.72. Similar figures for December were: Average price at which the coal was shipped, $2.56; average cost of producing it, $2.91.

"In view of the misleading and erroneous impression created by the statement of your organization, if the figures used therein are as I understand them to be, will you kindly see that a correction is published which will accurately quote the testimony submitted to the Interstate Commerce Commission."

Mine Workers' Committee to Meet March 24 At Cleveland to Settle Strike Policy

THE policy committee of the United Mine Workers of America, composed of 116 representatives, will meet at Cleveland March 24 to determine upon policies to be pursued by the miners in case they walk out or cease operations April 1. A statement to this effect was made by John L. Lewis, president of the union, in Washington on Monday, March 20.

Anthracite Agreement Not Expected by April 1; Mines Probably Will Suspend

OPENING in New York City March 15, the sixth general wage conference between the mine workers and operators of the anthracite fields since the award of 1903 of the Anthracite Coal Strike Commission was attended by 74 representatives of the operators and 39 members of the miners' tri-district scale committee in addition to International President John L. Lewis and Vice-President Philip Murray.

President Lewis called the conference to order and William L. Connell, of Scranton, was chosen as permanent chairman and James Gorman, of Hazleton, Pa., as secretary. President Lewis made formal presentations of the demands adopted at the Shamokin convention and they were outlined in detail by District Presidents Thomas Kennedy, Chris Golden and William J. Brennan, and Andrew Matti, vice-president of District No. 7.

S. D. Warriner, president of the Lehigh Coal & Navigation Co., as chairman of the operators' general policies committee, requested a recess so that the operators could consider the demands of the workers, and an adjournment was taken until March 17 at 2:30 p.m.

The demands of the miners were given in full in *Coal Age* of Jan. 26.

When the conference was resumed on March 17 at the Pennsylvania Hotel Mr. Warriner presented the reply of the operators to the demands of the miners. As was expected, the mine owners insist that a reduction in wages is imperative, saying that readjustment of wage rates is the first essential step to a reduction in the price of anthracite to the consumer and to insure continued stability in the industry.

After the reply had been presented, upon motion of Mr. Warriner it was decided to refer the demands of the miners and the reply of the operators to a joint sub-committee of operators and miners for the purpose of arriving at an agreement. Those representing the operators will be Mr. Warriner, W. J. Richards, president of the Philadelphia & Reading Coal & Iron Co.; W. W. Inglis, president of the Glen Alden Coal Co., and W. L. Connell, representing the independent coal operators. For the miners there will be the three district presidents, Messrs. Kennedy, Golden and Brennan, and International President Lewis, with Vice-President Murray as alternate for Mr. Lewis. Alvin Markle was chosen chairman of the joint sub-committee and James A. Gorman, secretary, both without votes. The discussion of the demands was scheduled to begin Tuesday afternoon, March 21.

Apparently there is no expectation that an agreement can be reached before April 1. Lacking an agreement and contract, the mines will suspend operations, it is said.

The statement of the operators in full follows:

> The object of this conference should be to construct a working agreement which will, in contrast with conditions in other coal fields, continue to afford a basis whereby the anthracite industry will provide fair wages, full-time employment to its workers, and a maximum production of coal at a cost which will enable it to be sold to its customers at a price they are able to pay.
>
> The consuming public is largely composed of wage earners in other industries, who have already accepted substantial decreases in their earnings, and who cannot continue to pay present prices in order that the workmen in the anthracite field may hold their present scale of wages.
>
> With these facts in mind the general policies committee is authorized to say in reply to your communication to the joint conference of anthracite operators and miners, embodying 19 demands to be used as the basis of an agreement to take the place of the one now in effect, which expires March 31, next.
>
> Careful consideration has been given to the demands and to the explanatory remarks made by the speakers at the joint conference. It should be stated in the first place that the anthracite operators are not unwilling to continue contractual relations with the United Mine Workers of America, but, on the contrary, are willing to continue the practice of dealing with that organization as representing their employees, provided that the form of contract is in accord with the principles laid down by the Anthracite Coal Strike Commission, appointed by President Roosevelt in 1902, and the Anthracite Coal Commission, appointed by President Wilson in 1920; and, provided, further, that the jurisdiction of the Board of Conciliation that has been a potent factor in the preservation of peace in the anthracite region shall not be questioned or abridged. The operators are ready to consider and discuss any proposition relating to wages and working conditions submitted by either party.
>
> When it comes to matters affecting the cost of production, there is another party to be considered, viz: the buyer. Any adjustment which is not satisfactory to the buyer must inevitably fail, for in that event production cannot be distributed, and the miner will then lose his opportunity for employment. The interests of all parties will best be conserved by steady work for the miner, maximum production at the mines, and the widest possible market for the product. To secure this a reasonable cost of production is necessary. Anthracite is the only basic commodity which has not receded in cost of production since the war. In fact, costs of anthracite production today are far above the war-time peak.
>
> The deflated pocketbook of the buyer cannot continue to pay the present prices. Economy is being practiced by the consumer and various substitutes for anthracite are being used. But for the fear on the part of the public of a suspension April 1, the recent movement of anthracite would have been even less than it was, with the result of short time employment throughout the region. The economic situation today not only forbids any increase in costs and prices but compels a reduction.
>
> Anthracite labor is the only group in this country which has not sustained a decrease in wages in line with the general readjustment in other industries nor has it suffered a material decline in the opportunity for steady work. Deflation in the cost of production, 70 per cent of which is represented by mine labor, is imperative. The anthracite operators, after most careful thought, can see no alternative. Readjustment of the wage rates is the first necessary step to reduce the cost of anthracite to the consumer and to insure continued stability in the industry.
>
> It is obvious, then, that prosperity and steady work in the anthracite fields must cease unless the price of anthracite coal can be reduced to a figure which the consumer can pay. We are confident that if in our negotiations this absolutely controlling factor is kept constantly in mind we shall be able to reach a conclusion which will promote the welfare of all concerned. And with this hope we are prepared to consider through the negotiating committee any matter pertaining to wages and working conditions presented by either party.

Sewalls Point Exchange Ceases Operation

MEMBERS of the Sewalls Point Coal Exchange have ratified the action of the board of directors in voting to wind up its affairs, and the exchange has ceased to operate. This action had been under discussion for several months. This leaves only the Newport News Coal Exchange in operation, the Lamberts Point Exchange having ceased to function Feb. 15.

There is some talk in trade circles of reviving the Sewalls Point Exchange under another organization of a more commercial character, but nothing definite in this regard has been accomplished.

The sampling plant of the Sewalls Point exchange is the most modern of its kind and proved an innovation in the classification of coal at Hampton Roads. Some arrangement whereby this plant may still be used as an adjunct to the coal piers is being thought out. The Sewalls Point exchange handled all the coal shipped over the Virginian Ry. terminals, and in the future its dissolution will not affect the handling of coal except that it will be consigned to individual shippers instead of to the pools.

State Police at Thomas, W. Va., Guard Men Who Return to Work at Reduced Wage

IT became necessary on March 13 to assign a detachment of state police to duty at Thomas, W. Va., where the Davis Coal & Coke Co. is operating mines. This precaution has been taken to protect the miners who are willing to work at a reduced wage. The decision to assign state police to Thomas followed an attack made by wives and sympathizers of foreign miners on a number of mine workers on their way to work at Thomas on Saturday, March 11. As these men passed through a cut on the public highway they were so severely pelted with stones that they had to turn back. Captain White of the state police joined Sheriff Close of Tucker County on the Monday following and after making the rounds with him decided to send four members of the police to Thomas.

So far the miners opposed to any wage reduction—and they consist largely of foreigners and negroes, who predominate in this section—have resorted only to picketing and to a show of force, surrounding miners who want to go to work and turning many of them back.

Production and the Market

Weekly Review

STRIKING evidence of the weakened condition of the market is found in the marked decline in spot prices this week, ten of the fourteen coals entering into the *Coal Age* Index recording decreases, with the result that the index dropped five points to 173, the sharpest decline this year. Spot prices on soft coal are now lower than at any time since the middle of 1916.

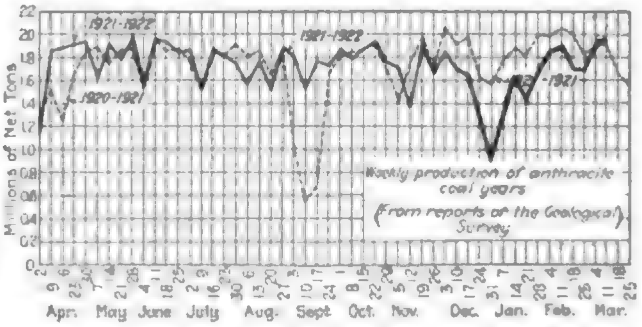
But while prices have been dropping, production has gone up. Forced sales and stocking by railroads and public utilities have taken the large outputs in recent weeks. In the last few days before April 1 the operators of union mines will fill every car they can obtain, thus holding production to a high level up to the last minute.

There is no feeling of apprehension now being shown by consumers in the face of the impending suspension. The reason for this, of course, is that stocks are in comfortable volume and that with the present low rate of industrial consumption they will last for some time. Then, too, non-union offerings are heavy. The tendency now is to stay out of the market until reserves are in need of replenishment. Inquiries continue numerous, however, and it is plain that consumers want to have access to non-union supply when the need comes.

MARKET SLUGGISH, NON-UNION OFFERS PLENTIFUL

That this supply will be more than ample is indicated by the increasing number of contract offers that are being made, and this non-union contract interest may be expected to grow as long as the spot market lacks snap. A New England railroad has just completed an arrangement for a large tonnage, over the next twelve months, at $1.50 for a good grade of Connellsville coal. The next few months' outlook for the coal producer is not encouraging. The supply, plus reserves now in hand, is so topheavy that considerable improvement in consumption requirements must be made before the market can come to a turning point. The industrial horizon is not altogether dark, however. Industrial convalescence is slowly but surely gaining ground. The steel mills are showing more signs of stability. Building trades are more active and better buying all around is predicted as farm products are becoming stronger.

Hard-coal demand is waning, although there is more of a tendency toward retail stocking than in the bituminous coal trade. Dealers have generally taken precautions to carry over sufficient tonnage of the family sizes to meet their needs until about May 1. Steam coals are moving well but large users are nearly stocked up and heavy storage at the mines reassures those who have not yet taken all they think necessary.



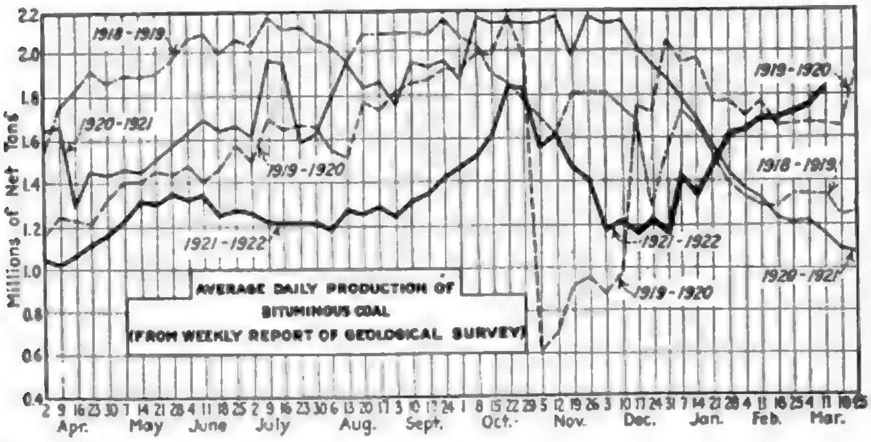
Weekly production of anthracite coal years

(From reports of the Geological Survey)

The coke market has turned easier but prices are not yet softening. There is no diminution in demand to account for the changed conditions, which is attributable to the poorer call in the coal market.

BITUMINOUS

Production increased another 500,000 tons during the week ended March 11. The output was 11,058,000 net tons, as compared with 10,553,000 tons in the previous week. Car loadings on the first two days of last week indicate that the upward trend is being continued. The present



AVERAGE DAILY PRODUCTION OF BITUMINOUS COAL

(FROM WEEKLY REPORT OF GEOLOGICAL SURVEY)

Estimates of Production

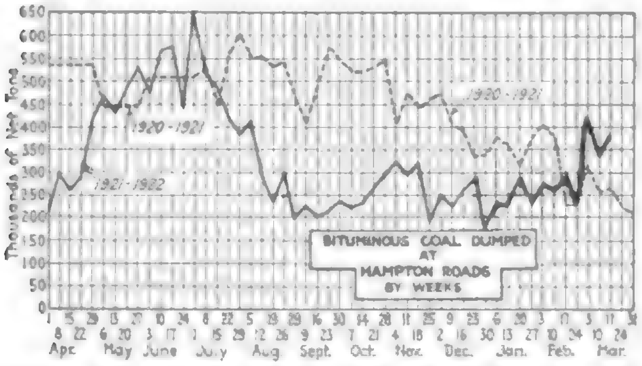
(Net Tons)

BITUMINOUS

Week ended:	1921–1922	1920–1921
Feb. 25 (*b*)	10,402,000	7,432,000
March 4 (*b*)	10,553,000	7,278,000
March 11 (*a*)	11,058,000	6,900,000
Daily average	1,843,000	1,150,000
Coal year	403,047,000	503,539,000
Daily av. coal yr.	1,392,000	1,732,000
ANTHRACITE		
March 4	1,913,000	1,902,000
March 11 (*a*)	1,982,000	1,925,000
Coal year (*b*)	81,261,000	85,471,000
COKE		
	1922	1921
March 4 (*b*)	143,000	178,000
March 11 (*a*)	154,000	162,000
Calendar year	1,294,000	2,257,000

(*a*) Subject to revision. (*b*) Revised from last report course of production is like that of last fall, when buyers increased their orders in anticipation of a railroad strike.

Much of the recent output has gone into storage, but it probably would require further stocking of 7,000,000 tons before reserves reach the level which obtained at the close of the war. Industrial consumers are not inclined to take more storage coal, as stocks are considered nearly adequate. Business activity is not increasing rapidly enough to cause buyers any apprehension about present reserves, which are not as heavy as when strikes have impended in the past. With the prospect of lower delivered fuel costs in the future and with non-union tonnage available in such good volume the buyer fails to see the necessity for further expenditures on his fuel account.



Railroads and public utilities, however, are continuing to accumulate tonnage. The carriers are not only storing at their usual supply bases but have in many cases repaired bad-order cars sufficiently to permit their being loaded and stored on track. Operators are filling every car available, especially in the Midwest, and there is much tonnage standing on track throughout the country.

The domestic market is stagnant. Householders are indifferent to the strike prospects and are making provision only for the balance of the season. Retailers reflect this attitude in their orders, as they profess a desire to reduce their yard stocks to a minimum in order to take advantage of the changed mining conditions after the strike.

All-rail shipments to New England are holding fairly well. During the week ended March 11 there were 3,695 cars moved, as compared with 3,868 cars in the preceding week. This tonnage is largely contract fuel which is being pressed on old agreements before their expiration on April 1. Pennsylvania spot coals are very slow in this section, except where special price cuts have been made.

Dumpings for all accounts at Hampton Roads were

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

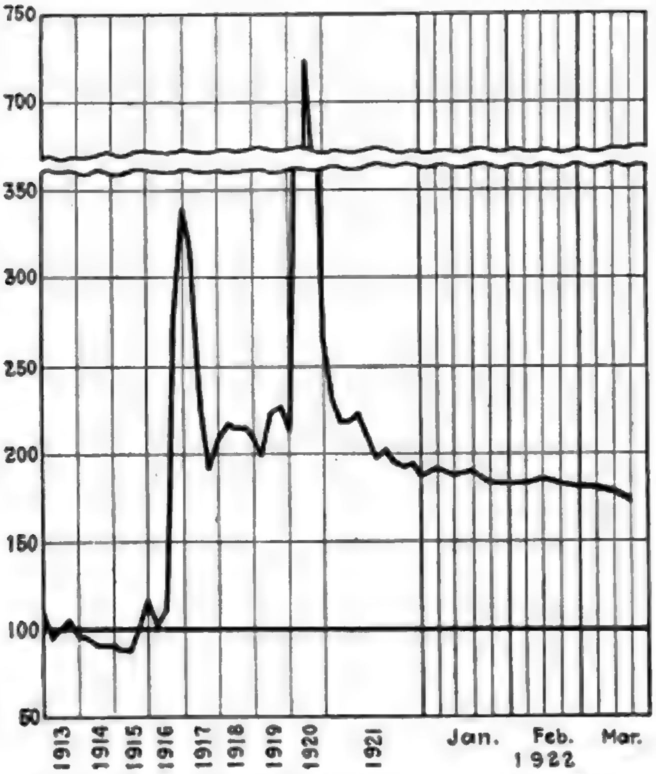
Low-Volatile, Eastern	Market Quoted	Feb. 20 1922	Mar. 6 1922	Mar. 13 1922	Mar. 20 1922†
Pocahontas lump	Columbus	$3.25	$3.20	$3.15	*$3.00@$3.15*
Pocahontas mine run	Columbus	2.10	1.85	1.85	1.75@ 2.00
Pocahontas screenings	Columbus	1.55	1.35	1.45	*1.10@ 1.25*
Pocahontas lump	Chicago	3.15	3.15	3.15	3.00@ 3.25
Pocahontas mine run	Chicago	2.15	2.00	1.85	1.65@ 2.00
Pocahontas lump	Cincinnati	3.15	3.15	3.15	*2.75@ 3.00*
Pocahontas mine run	Cincinnati	1.75	1.75	1.75	*1.65@ 1.75*
Pocahontas screenings	Cincinnati	1.15	1.15	1.15	1.00@ 1.25
*Smokeless mine run	Boston	4.55	4.65	4.60	*4.50@ 4.65*
Clearfield mine run	Boston	1.95	1.95	1.95	1.65@ 2.25
Cambria mine run	Boston	2.45	2.45	2.45	2.25@ 2.60
Somerset mine run	Boston	1.90	1.90	1.90	1.75@ 2.00
Pool 1 (Navy Standard)	New York	3.00	3.00	2.95	*2.75@ 3.00*
Pool 1 (Navy Standard)	Philadelphia	3.05	3.05	3.05	*2.85@ 3.15*
Pool 1 (Navy Standard)	Baltimore	2.55	2.70	2.65	2.60@ 2.70
Pool 9 (Super. Low Vol.)	New York	[illegible]	2.50	2.40	*2.10@ 2.50*
Pool 9 (Super. Low Vol.)	Philadelphia	2.45	2.45	2.45	*2.10@ 2.60*
Pool 9 (Super. Low Vol.)	Baltimore	2.25	2.30	2.15	2.00@ 2.25
Pool 10 (H. Gr. Low Vol.)	New York	2.10	2.10	2.00	*1.75@ 2.05*
Pool 10 (H. Gr. Low Vol.)	Philadelphia	[illegible]	[illegible]	[illegible]	1.90@ 2.20
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.05	2.15	[illegible]	2.10@ 2.15
Pool 11 (Low Vol.)	New York	1.75	1.75	1.70	1.60@ 1.80
Pool 11 (Low Vol.)	Philadelphia	1.75	1.75	1.75	1.65@ 1.85
Pool 11 (Low Vol.)	Baltimore	1.75	1.95	2.05	**2.00@ 2.10**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.50	1.60	1.60	*1.45@ 1.60*
Pool 54-64 (Gas and St.)	Philadelphia	1.50	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)	Baltimore	1.40	1.55	1.55	1.50@ 1.60
Pittsburgh sc'd. Gas	Pittsburgh	2.65	2.70	2.70	*2.60@ 2.70*
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.15	*1.90@ 2.10*
Pittsburgh slack (Gas)	Pittsburgh	1.65	1.65	1.65	*1.50@ 1.60*
Kanawha lump	Columbus	2.65	[illegible]	2.50	*[illegible] 2.40*
Kanawha mine run	Columbus	1.65	[illegible]	1.60	*1.40@ 1.65*
Kanawha screenings	Columbus	1.30	1.30	1.40	**1.35@ 1.50**
W. Va. Splint lump	Cincinnati	2.35	2.25	2.50	*2.00@ 2.25*
W. Va. Gas lump	Cincinnati	2.05	2.00	2.15	*1.75@ 2.00*
W. Va. mine run	Cincinnati	1.50	1.35	1.35	**1.25@ [illegible]**
W. Va. screenings	Cincinnati	1.20	1.30	[illegible]	1.25@ 1.35
Hocking lump	Columbus	2.65	2.65	2.60	2.50@ 2.70
Hocking mine run	Columbus	1.90	1.90	1.90	*1.65@ 1.90*
Hocking screenings	Columbus	$1.30	$1.45	$1.50	**$1.40@ [illegible]**
Pitts. No. 8 lump	Cleveland	3.10	3.10	3.05	*2.85@ 3.00*
Pitts. No. 8 mine run	Cleveland	1.95	2.00	1.90	1.85@ 1.90
Pitts. No. 8 screenings	Cleveland	1.65	1.80	1.75	*1.65@ 1.75*
Midwest					
Franklin, Ill. lump	Chicago	3.30	3.25	3.45	*3.15@ 3.65*
Franklin, Ill. mine run	Chicago	2.50	2.50	2.50	2.25@ 2.75
Franklin, Ill. screenings	Chicago	2.00	2.00	1.85	**1.75@ 2.10**
Central, Ill. lump	Chicago	3.00	3.00	2.80	2.55@ 3.00
Central, Ill. mine run	Chicago	2.35	2.35	2.35	2.25@ 2.50
Central, Ill. screenings	Chicago	1.80	1.75	1.75	1.65@ 1.85
Ind. 4th Vein lump	Chicago	3.25	3.25	3.25	*3.00@ 3.25*
Ind. 4th Vein mine run	Chicago	2.50	2.50	2.40	**2.40@ 2.50**
Ind. 4th Vein screenings	Chicago	2.00	2.15	2.15	*1.90@ 2.15*
Ind. 5th Vein lump	Chicago	3.20	2.80	2.80	2.55@ 3.00
Ind. 5th Vein mine run	Chicago	2.25	2.35	2.35	*2.10@ 2.35*
Ind. 5th Vein screenings	Chicago	1.75	1.65	1.60	1.50@ 1.75
Standard lump	St. Louis	2.75	2.60	2.60	*2.40@ 2.70*
Standard mine run	St. Louis	1.95	1.95	1.85	*1.75@ 1.85*
Standard screenings	St. Louis	1.20	1.10	1.20	*1.00@ 1.25*
West. Ky. lump	Louisville	2.50	2.45	2.45	*2.25@ 2.50*
West. Ky. mine run	Louisville	1.85	1.85	1.85	*1.65@ 1.90*
West Ky. screenings	Louisville	1.40	1.80	1.65	*1.40@ 1.65*
South and Southwest					
Big Seam lump	Birmingham	2.90	2.60	2.60	2.50@ 2.75
Big Seam mine run	Birmingham	1.85	1.85	1.85	1.70@ 2.00
Big Seam (washed)	Birmingham	2.10	1.85	1.85	1.75@ 2.00
S. E. Ky. lump	Louisville	2.60	2.45	2.35	*2.00@ 2.25*
S. E. Ky. mine run	Louisville	1.55	1.55	1.50	**[illegible] 1.65**
S. E. Ky. screenings	Louisville	1.20	1.30	1.35	*1.25@ 1.35*
S. E. Ky. lump	Cincinnati	2.50	2.25	2.25	*2.00@ 2.25*
S. E. Ky. mine run	Cincinnati	1.50	1.40	1.35	**1.25@ [illegible]**
S. E. Ky. screenings	Cincinnati	1.10	1.20	1.30	*1.15@ 1.35*
Kansas lump	Kansas City	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	March 6, 1922 Independent	March 6, 1922 Company	March 13, 1922† Independent	March 13, 1922† Company	March 20, 1922† Independent	March 20, 1922† Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.00@$7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.[illegible]
Egg	New York	2.61	7.25@ 7.50	7.60@ 7.75	7.35@ 7.75	7.60@ 7.75	7.35@ 7.75	7.60@ 7.75
Egg	Philadelphia	2.66	7.15@ 7.75	7.75	7.15@ 7.75	7.75	7.15@ 7.75	7.75
Egg	Chicago	5.63	7.50*	6.90@ 7.40*	7.50*	6.90@ 7.40*	7.50*	6.90@ 7.40*
Stove	New York	2.61	7.75@ 8.10	7.90@ 8.10	7.85@ 8.10	7.90@ 8.10	*7.75@ 8.00*	7.90@ 8.10
Stove	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25
Stove	Chicago	5.63	7.75*	7.20@ 7.60*	7.75*	7.20@ 7.60*	7.75*	7.20@ 7.60*
Chestnut	New York	2.61	7.85@ 8.10	7.90@ 8.10	7.90@ 8.10	7.90@ 8.10	*7.85@ 8.00*	7.90@ 8.10
Chestnut	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25	7.75@ 8.15	8.05@ 8.25
Chestnut	Chicago	5.63	7.75*	7.20@ 7.60*	7.75*	7.20@ 7.60*	7.75*	7.20@ 7.60*
Pea	New York	2.47	4.50@ 5.50	5.75@ 6.45	4.50@ 5.50	5.75@ 6.45	**4.75@ 5.[illegible]**	5.75@ 6.45
Pea	Philadelphia	2.38	4.75@ 5.00	6.15@ 6.25	4.75@ 5.00	6.15@ 6.25	4.75@ 5.00	6.15@ 6.25
Pea	Chicago	5.63	6.00*	5.60@ 6.10*	6.00*	5.60@ 6.10*	6.00*	5.60@ 6.10*
Buckwheat No. 1	New York	2.47	3.00@ 3.50	3.50	3.00@ 3.50	3.50	*2.75@ 3.50*	3.50
Buckwheat No. 1	Philadelphia	2.38	2.75@ 3.50	3.50	2.75@ 3.25	3.50	2.75@ 3.25	3.50
Rice	New York	2.47	2.00@ 2.60	2.50	2.00@ 2.60	2.50	2.00@ 2.60	2.50
Rice	Philadelphia	2.38	2.00@ 2.50	2.50	2.00@ 2.50	2.50	2.00@ 2.50	2.50
Barley	New York	2.47	1.40@ 1.60	1.50	1.50@ 1.75	1.50	1.50@ 1.75	1.50
Barley	Philadelphia	2.38	1.50@ 1.75	1.[illegible]	1.50@ 1.75	1.50	1.50@ 1.75	1.50
Birdseye	New York	2.47	1.65@ 1.75	2.00@ 2.[illegible]	1.65@ 1.75	2.00@ 2.50	1.65@ 1.75	2.00@ 2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index 173, Week of March 20, 1922. Average spot price for same period, $2.10. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

377,307 net tons during the week ended March 16, as compared with 346,553 tons in the previous week. Accumulations at Tidewater have declined, while vessel tonnage awaiting cargo has increased. Most of the coal dumped is going to New England. Those markets are so surfeited with coal that prices has sagged, while distress cargoes are on the increase.

ANTHRACITE

Production of anthracite increased to 1,982,000 net tons during the week ended March 11, as compared with 1,913,000 tons in the preceding week. Consumers are not stocking in anticipation of any shortage. The majority of the retailers have already made provision for what tonnage they wish to carry over after April 1 and the market has turned softer. In fact, were it not for the last-minute stimulation caused by some late dealer stocking the market would be very weak at this writing.

Steam coals have been stocked heavily by the larger users and the demand has softened. No interest has been shown as yet by Lake purchasers, as dock stocks are still large and are moving very slowly.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Mar. 4, 1922 Inclusive	Week Ended Mar 4
Non-Union			
Alabama	63.5	61.2	66.1
Somerset County	55.5	74.4	75.7
Panhandle, W. Va.	55.3	48.0	58.0
Westmoreland	54.9	57.4	63.8
Virginia	54.8	56.8	64.6
Harlan	53.3	52.8	55.1
Hazard	51.7	61.6	66.1
Pocahontas	49.8	59.0	61.4
Tug River	48.1	61.4	67.9
Logan	47.6	59.6	68.6
Cumberland-Piedmont	46.6	48.0	50.2
Winding Gulf	45.7	61.9	67.3
Kenova-Thacker	38.2	52.1	61.5
N. E. Kentucky	32.9	44.2	55.4
New River**	24.3	29.2	31.0
Union			
Oklahoma	63.9	59.4	64.7
Iowa	57.4	75.9	79.1
Ohio, north and central	52.6	44.8	47.9
Missouri	50.7	63.6	76.5
Illinois	44.8	52.1	58.6
Kansas	42.0	50.5	61.7
Indiana	41.4	51.9	59.0
Pittsburgh†	41.2	36.7	37.8
Central Pennsylvania	39.1	47.6	48.2
Fairmont	35.3	47.1	35.5
Western Kentucky	32.5	34.9	40.0
Pittsburgh*	30.4	28.1	31.8
Kanawha	26.0	13.6	12.6
Ohio, southern	22.9	24.3	29.1

*Rail and river mines combined.
†Rail mines.
**Union in 1921, non-union in 1922.

COKE

Beehive coke production registered another increase during the week ended March 11. The output was 154,000 net tons, as compared with 143,000 tons in the previous week.

Recent coke offerings were small, which accounted for the increasing prices over the past month. The poor demand for coal has eased the situation, however, and coke production is now adequate. The coke market has softened in the past week, although prices are not yet quotably lower.

Foreign Market And Export News

Hampton Roads Pier Situation

	Week Ended March 9.	Week Ended March 16.
N. & W. Piers, Lamberts Point:		
Cars on hand	2,533	1,598
Tons on hand	134,436	89,810
Tons dumped	122,795	158,087
Tonnage waiting	6,750	18,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,424	1,690
Tons on hand	71,200	84,500
Tons dumped	12[illegible],309	93,418
Tonnage waiting	2,500	15,000
C. & O. Piers, Newport News:		
Cars on hand	1,375	1,234
Tons on hand	58,750	61,700
Tons dumped	60,719	85,377
Tonnage waiting	—	1,100

Coal Paragraphs from Foreign Lands

GERMANY — Production in the Ruhr region during the week ended March 4 was 1,838,000 metric tons, according to a cable to *Coal Age*, as compared with 1,978,000 tons during the preceding week. February production reached 7,750,000 tons and in Upper Silesia, 2,691,000 tons. Transportation was entirely disrupted by the railway strike and the freezing of waterways and has not yet returned to normal. Freight rates were increased about 20 per cent on March 1, and are now 32 times the pre-war figures.

ITALY — The price of Cardiff steam first is now 42s. 3d., according to a cable to *Coal Age*. Last week's quotations ranged around 42s. 9d.

Export Clearances, Week Ended March 16, 1922

FROM HAMPTON ROADS

For Atlantic Islands:	Tons
Dan. S.S. Rolf, for Bridgetown	2,712
Nor. S.S. Krosfond, for Castries	2,807
Nor. S.S. Bur, for Fort-de-France	6,312
For Brazil:	
Br. S.S. Collingham, for Buenos Aires	5,491
Am. S.S. Robin Hood, for Rio de Janeiro	8,285
Br. S.S. Sallust, for Rio de Janeiro	2,026
For Canada:	
Am. Schr. J. Edward Drake, for Hamilton	1,120
For Cuba:	
Nor. S.S. Porsanger, for Havana	6,408
Nor. S.S. Anna Sofie, for Havana	2,988
Nor. S.S. Tosto, for Cavenas	1,004

FROM PHILADELPHIA:

For Brazil:	
Br. S.S. West Gambo, for Rio de Janeiro	

INFORMATION RELATIVE TO POSSIBLE COAL MARKETS can be obtained by consulting "Foreign Trade Opportunities" *Commerce Reports*, issue of March 13, 1921, Nos. 1031, 1038, 1046, and 1065.

British Benefit from Strike Talk Here; French Industry Needs Lower Costs

Production in Great Britain decreased slightly during the week ended March 4, according to a cable to *Coal Age*. The output was 5,039,000 gross tons as compared with 5,047,000 gross tons during the previous week, the high mark for the year.

South Wales market activity is not affected by the engineers' lockout demands. The impending labor trouble at American mines is strengthening the call and all export markets are improved.

Exports during February continued to increase. The total shipments were 5,014,000 gross tons as compared with 4,020,935 tons in January, and 4,309,162 tons in December. Exports during February a year ago were only 1,728,000 tons.

Ascertaintment of the mining industry in January, which fixed the wages for March, shows the wage percentage to be 61.71 per cent above the basis rates, or a drop of 10 per cent on the previous month. Wages, however, are unchanged, as under the National Agreement they cannot fall below 89 per cent.

French Coal Trade in Serious Shape: Coming Reductions Will Help

The industrial crisis persists, and the slight improvement marked from November to January again seems to be something of the past. On top of this, competition of British coals is getting sharper.

Industrial coals are, if anything, even in less demand, and sometimes offers are made at as low as 90 fr., delivered. The Collieries in the Nord, in order to get rid of the huge stocks have again established price reductions according to quantities lifted; they vary from 50 centimes per ton up to 500 tons to 2 fr. for quantities between 1,500 and 2,000 tons. In certain cases reductions of 3 and even 4 frs. are paid on industrial coals.

Wage reductions which will be enforced from April, will permit a drop of about 8 fr. per ton. A bill has been lodged with the House of Commons to permit exceptions to the 8-hour act in the mining industry.

The Minister of Public Works has also asked public utility enterprises to use French coals whenever possible instead of foreign coals, and it has been decided that the latter will only be used when their c.i.f. price is more than 10 fr. lower than the cost of French fuel. Reductions in rail-freights are also being arranged.

British Coal Exports, January, 1920, 1921 and 1922

BY DESTINATION

Country	Gross Tons 1920	1921	1922
Russia	4,215		19,495
Sweden	164,180	40,672	116,509
Norway	119,391	44,035	112,332
Denmark	175,651	71,651	190,786
Germany	479	14,393	247,313
Netherlands	82,031	83,807	294,538
Belgium	68,995	13,847	253,375
France	1,622,663	565,405	1,172,544
Portugal	53,820	25,986	58,401
Azores and Madeira	9,846	2,384	9,099
Spain	36,279	116,154	132,053
Canary Islands	28,168	2,686	24,680
Italy	363,420	308,318	481,495
Austria	44,766	......	......
Hungary			
Greece	35,680	22886	61,227
Algeria	40,181	20764	92,557
French West Africa	19,074	15,208	8,865
Portuguese West Africa	46,306	14,992	9,150
Chile	957	10,759	4,528
Brazil	50,981	436	31,401
Uruguay	29,892	19,306	46,023
Argentine Republic	82,361	22,757	121,866
Channel Islands	8,446	18,115	13,847
Gibraltar	85,204	22,669	64,313
Malta	35,499	19,172	8,863
Egypt	94,652	82,797	115,540
Anglo-Egypt, Sudan	......	......	......
Aden and Depend	6,019	......	10,836
British India	110	104	168,743
Ceylon		6,082	25,459
Other Countries	49,306	134,721	125,097
Total January	3,358,572	1,700,106	4,020,935
Total December	2,302,076	4,309,162	......

AMOUNT AND VALUE

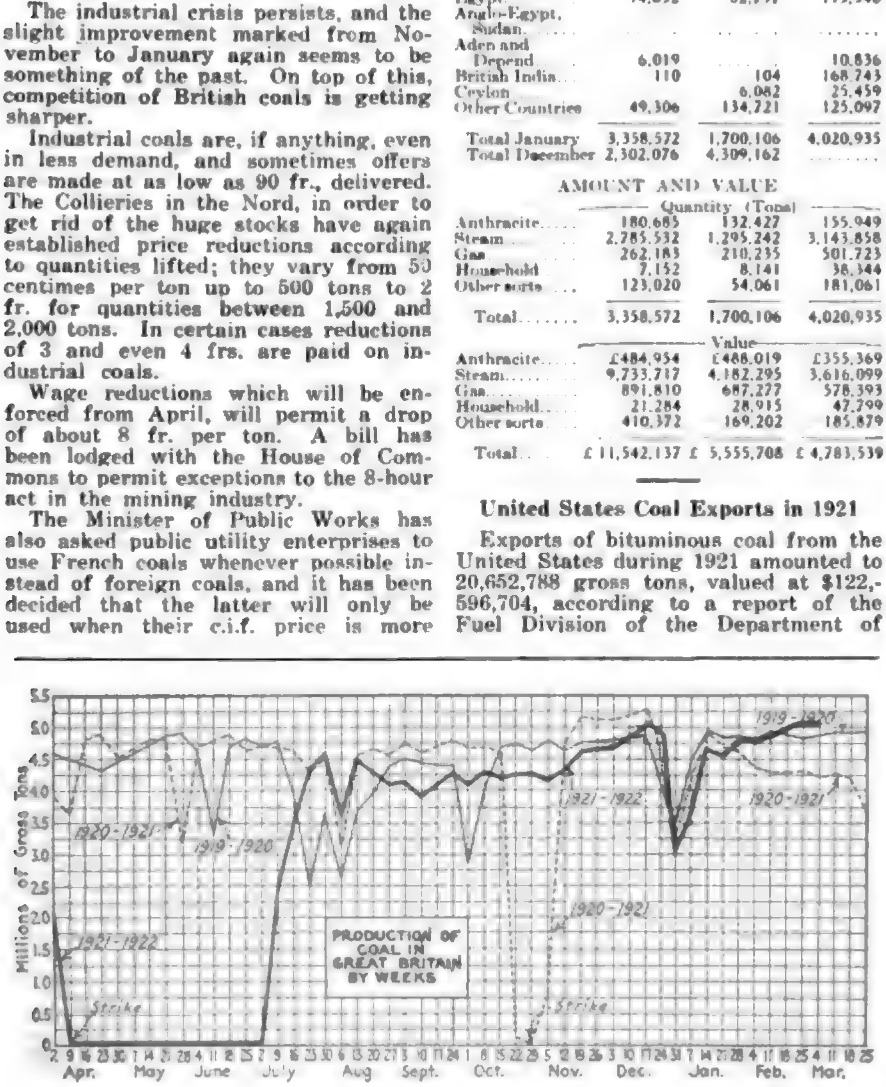
	1920	1921	1922
	Quantity (Tons)		
Anthracite	180,685	132,427	155,949
Steam	2,785,532	1,295,242	3,143,858
Gas	262,183	210,235	501,723
Household	7,152	8,141	38,344
Other sorts	123,020	54,061	181,061
Total	3,358,572	1,700,106	4,020,935
	Value		
Anthracite	£484,954	£488,019	£355,369
Steam	9,733,717	4,182,295	3,616,099
Gas	891,810	687,277	578,393
Household	21,284	28,915	47,799
Other sorts	410,372	169,202	185,879
Total	£11,542,137	£5,555,708	£4,783,539

United States Coal Exports in 1921

Exports of bituminous coal from the United States during 1921 amounted to 20,652,788 gross tons, valued at $122,596,704, according to a report of the Fuel Division of the Department of Commerce. This was a decline of 40 per cent, as compared with the 1920 exports, which were 34,390,254 long tons, valued at $304,273,241. These figures do not include bunker coal laden on vessels engaged in the foreign trade, which in 1920 aggregated 9,362,178 tons and in 1921 7,547,518 tons.

The decrease in 1921 was divided mainly between France, Netherlands, Sweden, Canada and Argentina. Of the total exports of soft coal, 12,483,550 tons or 61 per cent went to Canada. The 1921 exports, while below those of 1920, were nevertheless 300,000 tons above the average of the past nine years. Exports to Canada were 500,000 tons below the nine-year average and to other countries 1,000,000 tons above it.

Anthracite exports were 4,176,221 gross tons, about 650,000 tons less than in 1920. Coke exports declined 66 per cent from the 1920 figure, 1921 being 273,888 tons as compared with 821,252 tons in 1920.



Less Coal at Hampton Roads

Business has been brisk in the face of the impending coal strike. Coastwise movement is on the increase, while a slight revival in foreign shipments occurred last week. Dumpings were not increased to any extent in volume. But the number of orders filled was greatly in excess of the previous week. Accumulations at Tidewater have decreased, while vessel tonnage awaiting cargo has piled up.

Prices are stronger this week, and the tone of the market is firm. The greater portion of the tonnage moving is on contract, particularly for bunkers. A general tone of optimism pervades the market.

Pier and Bunker Prices, Gross Tons

PIERS

	March 11	March 18†
Pool 9, New York	$5.50@ $5.75	*$5.45@ $5.75*
Pool 10, New York	5.20@ 5.40	*5.15@ 5.50*
Pool 9, Philadelphia	5.50@ 5.85	5.50@ 5.85
Pool 10, Philadelphia	5.20@ 5.60	5.20@ 5.60
Pool 71, Philadelphia	5.70@ 6.00	
Pool 1, Hamp. Rds	4.60	*4.50@ 4.65*
Pools 5-6-7 Hamp. Rds	4.15@ 4.25	**4.30**
Pool 2, Hamp. Rds	4.45	**4.55**

BUNKERS

	March 11	March 18†
Pool 9, New York	$5.80@ $6.15	*$5.75@ $6.05*
Pool 10, New York	5.50@ 5.70	5.45@ 5.75
Pool 9, Philadelphia	5.90@ 6.10	*5.85@ 6.10*
Pool 10, Philadelphia	5.60@ 5.85	*5.50@ 5.85*
Pool 1, Hamp. Rds	4.75	**4.90**
Pool 2, Hamp. Rds	4.55	**4.70**
Welsh, Gibraltar	38s. f.o.b.	**40s. 6d. f.o.b.**
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	39s. t.i.b.	**42s. t.i.b.**
Welsh, Messina	36s. t.i.b.	**39s. t.i.b.**
Welsh, Algiers	34s. f.o.b.	**37s. f.o.b.**
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	40s. f.a.s.	*38s. f.a.s.*
Welsh, Teneriffe	40s. f.a.s.	*38s. f.a.s.*
Welsh, Malta	40s. f.o.b.	**42s. f.o.b.**
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Welsh, Naples	39s. f.o.b.	*38s. f.o.b.*
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	40s. 6d. f.o.b.
Belgian, Antwerp	30s.	30s.
Alexandria	45s.	**47s.**
Bombay	38 rupees	38 rupees
Capetown	39s.	39s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	March 11	March 18†
Admiralty, Large	27s.@ 27s. 6d.	27s.@ 27s. 6d.
Steam, Smalls	19s. 6d.@ 20s.	*19s.@ 20s.*
Newcastle:		
Best Steams	25s.	25s.
Best Gas	24s.	**24s.@ 25s.**
Best Bunkers	23s.@ 24s.	**23s. 6d.@ 24s.**

†Advances over previous week, shown in **heavy type**; declines in *italics*.

North Atlantic

Non-Union Coal Contracts Offered in Greater Number

Will Continue While Current Market Lags—No Apprehension Felt as April Approaches — Requirements Safeguarded—Evidence Seen That Supplies Will Be Available.

CONSUMER interest is waning and market prices have weakened in the past few days. Requirements have been quietly safeguarded and there is no apprehension felt over the strike outlook due to the possible inability to secure what little tonnage may be needed after April 1. The flow of non-union coal is convincing evidence that coal will be available when needed.

Contract offerings of non-union tonnage are increasing and will continue to do so as long as the current market lags. A larger number of loaded boats in New York harbor tends to strengthen boat rates.

BALTIMORE

Consumers are refraining from active staring in the face of the strike. The belief that the non-union mines will continue to produce, in conjunction with coal already above ground, enough fuel to take care of a possible period of strike and the present light call for fuel needs of the nation all have an effect in holding down buying. Prices are very weak.

A conference in Baltimore, March 13, between the northern West Virginia operators and representatives of the mine workers, District No. 17, was unfruitful of immediate results as the mine workers unexpectedly announced that they could not discuss the wage question without further authority. The conference was then adjourned until the middle of this week when another attempt to adjust will be made through a meeting in Baltimore.

PHILADELPHIA

Despite the fact that everyone has admitted that trade has been extremely quiet for the past few months, yet much of the coal shipped has been in excess of current needs and is now in stock. The tonnage of the past month compares well with the production of the years before the war.

Each day the belief grows that the only ones liable to feel the strike, at least for a month or two, will be the union operators. Lately there has been an increase in the tonnage offered to big concerns on a contract basis. If the spot demand does not strengthen there will be a further influx of contract offerings. Some good coals have recently been offered on a contract basis for limited tonnages at $1.80@$2.

There has been just the least semblance of a flurry in the spot market lately by a few concerns deciding at the last moment to lay in some reserve, and who endeavored to get immediate shipment.

NEW YORK

Consumers are not excited and buying is generally lighter than a few weeks ago. There are more cars at the local piers but most of this is on contract or for public utilities, and spot offerings are lighter.

There is considerably more strength in the demand along the line than at Tidewater, although prices are about on the same basis. It is conceded that with current needs no greater the non-union fields will produce sufficient coal to take care of the immediate situation.

There is a tendency among non-union mines to close some contracts and quotations on a basis of $2.20@$2.35 for Pool 10 have been reported. Higher grades are being quoted up to $2.75, subject to wage adjustments.

Southern coals coming into the harbor at present are mostly for public utilities.

FAIRMONT

Conditions remain much the same. Not more than 100 mines out of the 500 or more in the northern part of the state were in operation at any time during the week ended March 11. Tidewater shipments were somewhat heavier, but railroads were not buying on quite so large a scale.

CENTRAL PENNSYLVANIA

Two highly important developments marked the proceedings of the U. M. W. convention at DuBois last week. One was the adoption of a scale patterned after the demands voted at the international convention at Indianapolis. The other vital feature was the receipt of an invitation from the Association of Bituminous Coal Operators of Central Pennsylvania, asking the convention to appoint a scale committee to sit in joint session with a committee of the operators' association.

UPPER POTOMAC

Miners averse to any reduction are endeavoring to prevent those who have accepted lower wages from going to work by picketing and parades and in some instances are succeeding. Although there has been no general adjustment of wages in the district enough miners have returned to work at lower wages to increase production somewhat. Prices are a little stiffer and that is helping to some extent.

New England

Ask High-Volatile Bids Roads Flooded with Offers

Market Unimproved—Few Openings for Shippers — Numerous Distress Cargoes Disturb Prices—Marine Freights Soften—Reserves for 90 Days on Hand.

THE New England market shows no improvement. There are few openings in sight for shippers. The textile tie-up is reducing the tonnage needed and various other industries see no early increase in their fuel requirements. Distress cargoes are becoming numerous and lower prices have resulted. Marine freights have softened and this presents the only inducement for consumers to lay in additional reserves, which now range up to 90 days' supply.

Some railroads are asking bids on high-volatiles and this is bringing a flood of offers. Pennsylvania grades are quiescent except where special price cuts are made to compete with coastwise tonnage.

Both all-rail and by water receipts lately have made a better showing, but this is to be attributed to buying some weeks ago rather than to any improvement in current demand. Spot quotations have sagged again because of light request, and are shown in the Weekly Review.

The textile strike is only one factor in a very dull situation. Shoe manufacturing and other industries are sharing much the same dullness and there is an utter lack of snap that makes the current steam coal market abnormally quiet.

The surplus of marine transportation is again making itself felt. Rates of $1 flat have been named on steamers from Hampton Roads to Boston, and it is easy to predict the same level for barges of 2,500 to 3,000 tons.

At Boston there is still an amount of "distress' coal to be forced on reluctant buyers. On one steamer, about 7,500 tons. $1.10 demurrage was paid, due not to lack of handling facilities but to a market that was practically flooded with spot coal. Under such pressure prices on cars Boston have receded to $6.15, and in some instances to $6.

Contract requirements of certain of the New England railroads have caused a mild stir in the trade the past few days. Bids are asked on high-volatile and it is said that every coal man east of the Ohio River is out for a share of the tonnage.

Pennsylvania grades are quiescent. A few operators have made special prices for March shipment, but for the most part little is heard from the Pennsylvania fields. The somewhat increased movement is due largely to extra efforts on the part of producers to start forward unfilled balances on last year's contracts to which both railroads and other consumers stand committed.

Anthracite

Output Gains Slightly, Due to Last-Minute Demand

Retailers Avert Precipitous Decline in Domestic Market—Dealers Provide for Strike Carry-Over Seldom in Excess of 45 Days' Needs—Householders Indifferent.

PRODUCTION shows a slight increase. This is due, however, to a last-minute demand by some retailers, which has saved the domestic coal market from a precipitous decline. Dealer's stocks are far from being at capacity, but the majority of them have already made provision for what tonnage they desire to carry over—in only a few cases in excess of 45 days' requirements.

The householder continues to eke out his season's needs with small orders. Steam users are becoming well-stocked and the movement of these sizes is slowing up. Lake business has made no stir, as the Head-of-the-Lakes trade is having difficulty in moving supplies on hand.

BOSTON

While there is only a moderate demand, there is an evident shortening in supply. Producers are now turning down orders that are offered them, and even those companies who were easy on supply the first half of the month have now accumulated about all the boats they can be certain of clearing with March coal.

Retail demand continues light. Relatively very few householders are taking in coal for next winter; most people seem satisfied to wait until the hoped-for reduction is operative.

In larger cities there is more disposition to carry ninety days' retail supply. In smaller cities a six weeks' supply is about the average provision being made.

ANTHRACITE FIELDS

Practically nothing but the wage settlement is talked about in the region. Only a very few optimists predict that there will be no tie-up and it is a foregone conclusion that if there is no strike there will be an automatic suspension due to lack of demand.

Nearly all the mines have recovered from the wet spell of last week. The steam-shovel stripping engineers in the Hazelton field have settled their differences and the men have returned to work.

PHILADELPHIA

Retail purchasing has been moderate, but only because of the probability of a mine suspension on April 1.

News from the conferences between miners and operators has been far from definite and the retail men are still endeavoring to guess the outcome. All are buying a good excess over current deliveries, but as yet there is no yard with a capacity stock, and there is no likelihood that there will be.

Some dealers who had postponed adding to their stocks found last week that they had delayed too long, especially when they desired stove and nut. Despite this strengthening of demand there has been no increase in prices by independent shippers.

Steam sizes are unchanged, with buckwheat in good demand, barley extremely so, and rice more or less quiet. Big users are prepared for a shut-down of several months. In addition, they have a feeling of confidence based on the heavy stocks still in storage. However, railroads without heavy accumulations of coal will have first call on this tonnage in the storage yards.

BALTIMORE

An abrupt curtailment of the late ordering, stirred by warnings of possible conditions of a hard coal strike, came toward the close of last week. Dealers are much interested in the possibility of the Maryland legislature passing the 2,000 pound net ton law to replace the present gross ton law requiring the delivery of 2,240 pounds.

A warm contest has arisen on this subject with considerable misrepresentation from sources that have been warring upon the coal men lately. As the Merchants & Manufacturers Association has lined up behind the measure, however, it is hoped that the bill will be passed.

BUFFALO

Dealers have several weeks' stock on hand. The mild weather has lessened consumption. Independent prices show an easy tendency. The expectation is that business will be only moderately active during the remainder of the month. Dealers are being advised to have enough coal on hand to take care of requirements until at least the middle of May.

Leading shippers say they are not making any arrangements to load coal into vessels this month for the opening of navigation late in April. This season may, therefore, open late this year, making an active period toward the close.

NEW YORK

Consumers appear to have lost all interest in strike conditions and although advised by the retail dealers to put in at least enough coal to last them until warm weather sets in they have not been inclined to do so. Retail yards for the most part are kept well filled with the domestic coals and dealers are endeavoring to have sufficient on hand on April 1 to last them until May 1 at least.

It was reported there was a tendency on the part of some shippers in this harbor to load boats in anticipation of next month's suspension.

Steam coal is not so active. Weather conditions have acted as a fuel saver. Early in the week there were nearly 40 boats of the poorer grades, mostly rice, lying in the lower Bay. The higher grades move easily but are in larger supply than a few weeks back.

Company coals are in better demand than the independent product and for that reason some of the latter coals are hardly bringing full company schedule.

Coke

UNIONTOWN

The coal market is quiet although there is some contract activity. Any increased demand that may come because of the union strike has long since ceased to figure in speculation and operators are now prepared to handle the orders, if they come, and will not be disappointed if they don't.

Sewickley steam is quoted $1.30@$1.50; Pittsburgh steam, $1.40@$1.50 and byproduct $1.90@$2.

The coke market is inactive although prices are steady, there being but little demand and no tonnage without destination. Prices are; $3.30@$3.50 for furnace and $4.25@$4.75 for foundry.

CONNELLSVILLE

The coke market has turned easier, although prices are not definitely quotable at lower levels. The lack of strength is attributable to the decidedly softer conditions in the coal market, as coal of various grades has almost gone begging in the past week.

Prices for ordinary steam coal remain at $1.50@$1.60, about as low as operators can go, considering cost. Byproduct is offered at $1.60 and upward, depending on grade. A recent contract was at $1.50, this being taken as backlog business, 1,000 000 tons for a New England railroad for 12 months.

The Lackawanna Steel Co. has contracted for 15,000 tons of furnace coke a month beginning April 1, at $3.50 or a trifle less, to balance a possible deficiency in coal supply at its byproduct ovens on account of its mines being union.

Spot furnace coke is still quoted at $3.50 but the odd lots to be picked up at $3.25 have increased. Foundry continues in good demand, all signs indicating that foundries have been and are stocking some coke.

The *Courier* reports production during the week ended March 11 at 78,820 tons by the furnace ovens and 47,140 tons by the merchant ovens, making a total of 125,960 tons, an increase of 13,250 tons.

BUFFALO

Not much coke is being offered and the output is said to have been much curtailed. A scarcity is reported in Connellsville foundry, which is quoted $4.50@$4.75, with furnace at $3.25@$3.50. The larger sizes in crushed coke are in fairly active demand and prices are firm. A little surplus exists, however, in chestnut coke. To the above prices is to be added $3.64 for freight.

Chicago and Midwest

Eastern Coal Streams In; Price Advance Unlikely

Inquiries Heavier — Current Demand Improves, but Market Is Still Tight—Demand Is Only for Steam Coals—Railroads Stocking in Cars.

LAST-MINUTE inquiries are heavier and there is some improvement in current demand, but the market is still very tight. The number of orders placed is insignificant when compared with the tonnage available. Eastern coals are flowing in so heavily that prices are being shaved to avoid demurrage. Indiana and Illinois operators are loading every car available and indications are that April 1 will find a heavy tonnage on track. These sources, coupled with the good non-union supply, will easily absorb any late rush to cover that consumers may make, and at the same time keep prices from much of an advance.

What little demand exists is for steam coals. Railroads are still actively in the market and are storing coal in cars. Domestic tonnage is very slow and some producers are crushing the larger sizes. Price cuts on domestic coals have little effect, as neither the retailer nor the householder shows much inclination to make further provision against the strike.

All through the week selling organizations have been looking for a pick-up especially among the iron, brick, glass and automobile plants. They have been rewarded by a good many inquiries from these sources and a number of small orders but the market remained so definitely in the hands of the buyer that the business of selling coal continued unpleasant. Prices on a good many prepared sizes tended downward so that about every buyer on the market, shopped around and got it at about his own price. Steam demand was fair enough and lump and egg demand was poor enough, to cause the Peabody Coal Co., the biggest Illinois producer, to install and put into operation, a crushing plant at one of its mines.

With the strike only two weeks away, the trade, at the end of the week, finally began to show some slight concern. Three of the biggest operators in Chicago had a number of inquiries from heavy consumers asking for prices on coal to be delivered during the period ending with the night of March 31. In most cases no quotations were made, the companies claiming that the time has come for day-to-day prices because anything might happen between now and the mine suspension.

Selling agencies were watching closely last week to see who was contracting for Eastern non-union coal to be distributed through the Midwest region. It was reported that Midwest railroad yards were beginning to fill up during the last day or two of the week with this coal, so that even a good sized last-minute buyers' rush could easily be absorbed.

At the end of the week there was no noticeable checking of production. "No bills" at the mines were increasing but there was no stocking on the ground. One or two railroads were advising mine owners to produce every ton they could and put it on wheels. However, it is thought probable that miners themselves will take a hand in curtailing production even before the strike. Many are expected to quit work almost any time. So the coming week may see the banner production of the winter, if operators try to get a quantity of coal out before this slack-off starts.

CHICAGO

The market continued at its abnormally low ebb last week, showing no change until Friday and Saturday when there was a slight strengthening in the demand for steam. Eastern non-union coals ran into the city in a good sized stream, giving such concrete evidence that the non-union fields will care for the strike period that stocking did not cut much of a figure.

There is so little business for anybody that there was a good deal of price shading on prepared sizes on the part of a number of companies even though a determined effort is made to keep quotations generally from going into a slump. Company prices on such coals as southern Illinois prepared sizes continue at $3.25@$3.65 and central Illinois, $2.65@$3 but part of the business done in those same coals was at prices ranging 25c. or 30c. below the scale, and as the week closed, declines of 10c. a ton all around were common though a few companies maintained that their prices were already flat against rock bottom and that they would rather not sell at all than to undercut the circular.

The retail demand picked up ever so slightly during the latter half of the week because of the cooler weather, leaving dealers praying for at least another week of cold. The average householder's coal bin is practically empty.

SOUTHERN ILLINOIS

In spite of the fact that the strike is two weeks off there is little or no activity except on screenings. There is more doing in the Carterville field than in the others, but even here, most mines that are working only run two or three days a week.

Railroad tonnage is good and will continue so to the end of the month. It is likely as the end approaches that steam sizes will get better. Considerable dissatisfaction exists among the miners and in some parts of the field there is much destitution. All miners are in favor of a strike to maintain the present scale.

In Perry and Jackson counties somewhat similar conditions exist, except that four days are the limit on working time. Railroad tonnage is not good in this field.

Mt. Olive is working a trifle better, mostly on steam and railroad coal. Domestic is slow, with steam sizes going altogether on contract.

The Standard field shows no change. While railroad tonnage has picked up some domestic and steam seem to have fallen off and prices continue to slip. Screenings are in comparatively good demand.

LOUISVILLE

Although a strike apparently is inevitable the buyers are listless. Many large users are well stocked.

A strike is not expected to slow down things much in Kentucky, as most of eastern Kentucky is non-union, or the unions are not recognized, and workers are anxious for a chance to work. In western Kentucky one union section is on a non-strike contract with a year to run.

Coal today is to be had almost at the buyer's own figure, as eastern Kentucky mines are working on a much lower wage scale, and need business. Unless a strike develops a very slow market is in prospect for the next several weeks. The weather is too mild to create much demand for domestic sizes, although retailers are doing a little business, but principally from stocks on hand. Screenings are expected to tighten up shortly as a result of the small production.

WESTERN KENTUCKY

General demand has been poor. Screenings are not in the call that they were, but are moving. Production of lump is very light.

Industrial consumers appear to have stocked up fairly well. Some of them have been forced to hold up shipments. Railroad buying has been a little better.

In western Kentucky there are two operators' associations, one of which has a contract that has a year to run. This one field will probably be quite active during the closed period. It is understood that the contract carried a no strike clause, with the wage to be on the basis then in effect, but to be scaled according to any decision which might be reached by the United Mine Workers with other districts later on.

ST. LOUIS

Contrary to all expectations, business is dead. Domestic orders are almost unknown. There is some little movement on coke, largely experimental, on account of propaganda work. Hard coal is slow.

In the country sections the domestic call is easy, not much going into storage and what little is moving is cheap coal. Other years at this time the domestic demand for storage coal has been heavy.

Steam business locally is slow. It is probable, however, as April 1 approaches prices will go up and demand become greater when the public generally realizes that the strike may develop into something beyond the shutdown of a few weeks.

Northwest

Prices Firm as Strike Nears; Supplies Ample for Season

Suspension Will Enable Dock Men to Dispose of Higher-Priced Coals and Restock Under New Conditions—More Coal Moving—Buyers Still Hesitant.

PRICES are holding firm as the strike approaches. Dock men figure the coming suspension will afford an excellent opportunity to dispose of their high-priced stocks and allow them to refill their storage space under the new conditions after the strike. Coal supplies are more than ample for the balance of the season but a prolonged suspension would narrow the period during which Lake coal could be shipped, and restocking would thus be done under unfavorable conditions.

More coal is moving but the buyer is fluctuating between a desire to take only current needs and the possible need of reserves in excess of the season's requirements. Large users are the most active buyers at the present time, the smaller consumer generally delaying until a later date before taking in any tonnage that is not urgently needed.

MILWAUKEE

The weather thus far in March has been mild and spring-like and in consequence, the movement of coal from the docks is slow. City demand is light and orders from the country are not up to normal.

Some speculation is indulged in as to the probable drop of prices on April 1, but in view of the impending strike with its disturbance of the coal supply, buyers do not seem to be inclined to hold back for the small amount that may be involved. The supply of anthracite is fair and there is plenty of Pocahontas to be had. Soft coal screenings are not as plentiful as usual, but this is not a serious matter, as other grades of steaming coal are available. Prices of coal and coke remain undisturbed. There is an increased demand for the latter, following the recent cut of $2 per ton.

DULUTH

Business during the winter months of January, February and March will exceed the average of the same three months for the last ten years, according to predictions made by coal men here. The reason for the increase is that retail dealers last fall failed to place sufficient orders to carry them to the opening of navigation, and are now endeavoring to get enough coal in to fill their needs. Public utilities and railroads are also taking large tonnages in anticipation of the coal strike.

A dock survey just completed puts the bituminous coal tonnage at 3,300,000 and anthracite at 500,000. These figures show a comfortable margin before the opening of navigation but are not reassuring in view of a prolonged strike.

Prices are maintaining their strong tenor. Youghiogheny screenings are especially strong, selling at $4.75. In hard coal there is a shortage of stove; ample nut and pea, and a surplus of buckwheat.

Two docks have announced that their stocks will be cleaned up by the opening of navigation. These are the Carnegie and Northwestern.

The whole leaning here is toward strong optimism on the part of dockmen and dealers. Complaint against high prices, which was heard early in the season from consumers, has almost died away, it being evidently well established in the public mind that any excess in prices comes from high overhead and wages at the mines.

MINNEAPOLIS

The coal trade has been fluttering between having to buy for current demands and fearing to stock up in excess of what will be needed for the remainder of the winter. The commercial situation is nearly the same. What little difference exists is in favor of the present winter, which would mean a little more outlet for coal in industrial lines.

Buyers of coal for retailing or for distributing to the steam trade are trying desperately to meet the unknown condition of being supplied for reasonable needs without stocking beyond the time that new season's prices (expected to be at a much lower level) are available. There is ample coal on the docks for some months to come. The danger to the Northwest will be wholly if the suspension endures until far into the summer, and the restocking of the docks has to come into competition with the demands from all other sections. People in the trade rather regard the suspension, if it comes, as being likely to help clean up high-priced coal in dealers' bins and yards, and to some extent on the docks. The dock prices always follow the general market. Buying during the next few weeks will be at a minimum but there will be some forehanded buying by those who have very little in store.

One thing which would stimulate the movement of coal more than all else, is the revival of business activity, which seems to be on its way. Things have been depressed for a long time, but are on the mend, and the turn seems to be well established. Farm products have been at a minimum price for months, but are increasing in price. Slowly, the costs of many commodities which the farmer must buy, are declining, and thereby getting closer to the standard established by his income. These conditions have served to help matters materially in sentiment. People are getting over the worst of their feeling that dense, black depression is and of necessity must cover the whole earth. They are beginning to seek the answer wherein they may find some means of trading under conditions as they now exist. And as they pursue this line of thought, better things are due with all concerned, including the coal trade.

South

BIRMINGHAM

With a more active inquiry for steam coal and some increase in business being taken on, there is a more hopeful feeling pervading the ranks of the coal men. Spot sales show an improvement and negotiations are under way for the renewal of industrial contracts, quite a number of which expire April 1. The L. & N. has sent out proposals for its coal supply for another year and bids are now in course of preparation.

The movement has increased materially in the past week. The Frisco is stocking heavily, taking the entire output of some of the Walker County mines at which contracts are held. The L. & N. also increased its contract allotments again the past week, while the Southern is taking a much heavier tonnage. To this may be added the improvement in the industrial and utility demand and the large amount of coal being transported for coke-making.

There is no change to be noted in the domestic trade. Lump coal is difficult to dispose of and there is a surplus on the rails. Some producers are throwing it on the steam market as a final resort.

Both steam and domestic quotations are more stable than for some time back, and there is little likelihood of prices going to lower levels. Rather there is a disposition to stiffen commercial figures. Schedules quoted the past week represent the prevailing prices at this time.

VIRGINIA

There was a slight drop in production during the week ended March 11. This loss was due to a slackening of the steam demand. Despite the drop in production some plants heretofore in idleness have resumed operations. Prices are a little lower. There is more inquiry for coke but only about 6,000 tons of coal a week are being utilized at this time.

Canada

TORONTO

The impending strike appears to have little influence upon market conditions here. The public seems to have the impression that prices may come down

As the dealers have large stocks on hand, bought at a high figure, no drop is likely to occur in the near future. The principal consumers of bituminous have sufficient stocks on hand to meet their present limited requirements for some time.

Quotations are as follows:

Retail.	—
Anthracite, egg, stove and nut	$15 50
Anthracite pea	14 00
Bituminous steam	$9 25@$9 75
Domestic lump	11 25
Cannel	16 00
Wholesale, f.o.b. cars at destination:	
¾ in. lump	7 00@ 7 75
Slack	6 00@ 6 75

Eastern Inland

Increased Production and Stocking Weaken Prices

Consumers, Indifferent to Approach of Strike, Stay Out of Market—Will Rely on Present Stocks and Non-Union Producers.

GREATER production and consequent stocking has been the cause of a weakening of prices on the Eastern Inland coal market. Consumers are more indifferent in the face of the approaching strike and the general tendency now is to stay out of the market, relying on present stocks and the non-union suppliers after April 1. Inquiries are more numerous, however, and it is plain that the consumer wants to know where he can lay his hands on coal when it is needed.

Railroads and public utilities are the only active factors in the market today. The carriers are not only storing coal in the usual manner but some have put "bad order" cars in sufficient repair to get them under load and on track.

CLEVELAND

The bulletin of the Cleveland Trust Co. for March declares that industrial coal consumers are viewing the approaching strike with no apprehension, in view of stocks sufficient for about six weeks and prospects of a substantial flow of coal from non-union mines.

A survey in Cleveland reveals that, with promised production from the non-union fields, a shortage is improbable. Public utilities are well stocked and the city has just authorized the expenditure of $500,000 for the purchase of coal against the strike. The Cleveland Electric Illuminating Co., has a supply of 200,000 tons on hand, sufficient for 100 days. The average daily consumption of 2,000 tons is being offset by fresh deliveries and by April 1, the 100-day supply will be intact.

The municipal water and light plants have about 25,000 tons in storage or sufficient to last for 70 days. Other city departments are equally well protected. Stocks in retail yards are sufficient to supply all demands for the remainder of the season. The New York Central has enough coal stored in this section to last for 35 days. Industrials are buying more coal as a result of greater plant activity, but little storage against the strike is apparent. Inquiries are numerous, however, and it is clear that users are anxious to know where they can put their hands upon supplies when they need them.

The steamer Leopold arrived at Sandusky a few days ago from Cleveland, loaded with coal and cleared for Chicago. This is the first movement of the season.

DETROIT

Wholesale dealers and jobbers report there is only a moderate volume of buying. Despite the apparently wide divergence between the demands of the workers and the position of the employers, some of the local consumers are expressing a belief that no long strike will develop. The strongest retarding influence, however, is the generally unsatisfactory condition of business.

Household buying has diminished with the passing of wintery temperatures. Many of the retail dealers are holding large stocks.

West Virginia 4-in. lump is quoted $2.50, 2-in. lump, $2.25, egg, $2, mine run, $1.50, nut and slack, $1.30. Ohio 3-in. lump is $2.75, 1¼-in. $2.50, egg, $2.25, mine run, $1.85, nut and slack, $1.50. Pittsburgh No. 8 1¼ in. is $2.35, ¾-in. lump, $2.15, mine run, $2, nut and slack, $1.85. Smokeless lump and egg is $3.25, mine run, $2, nut and slack, $1.50.

BUFFALO

The market shows no improvement. Consumers have ample stocks to carry them for at least a month, and, as they anticipate a reduction in prices, as well as freight rates, they are unwilling to make any purchases.

Business activity does not appear to be increasing to an extent sufficient to cause alarm over the depletion of coal stocks, and there is a general feeling that non-union mines will be able to take care of the requirements of consumers for some weeks.

The annual inquiry for coal on contract for municipal and other large institutions is now being made. Under present conditions, however, the authorities are not likely to be satisfied with the results of their advertising, and the coal men are not in position to quote intelligently a year ahead.

COLUMBUS

Only occasionally a large order is being booked, where the purchaser is desirous of accumulating stocks. Buyers as a rule are somewhat anxious to talk contract but producers and shippers are holding off until labor troubles are ironed out.

The principal demand is still for steam grades. Screenings are moving in fair volume but in certain sections they are scarce because of the curtailed production of lump. Railroads are buying both for storage on track and for accumulating in reserve stocks at certain junction points. A survey of the situation in Ohio shows that most steam users have supplies for 60 to 90 days and consequently they are not worrying.

Domestic trade is extremely slow. Dealers' stocks are adequate for the present. Retailers are devoting their time to cleaning up and as a rule are loath to accumulate heavy stocks at this time. Consumers are only buying sufficient coal for the remainder of the winter. Retail prices are fairly stable at former levels, with some cutting to force trade.

PITTSBURGH

There is no expectation that officials of the local district of the U. M. W. will take any practical action in response to the formal invitation of the Pittsburgh Coal Producers' Association that a meeting be held to negotiate a local wage agreement. The more common guess is that breaks from the union ranks will occur first on the fringe of the district, where some mines have turned non-union in the past few months. On the other hand there are bare possibilities of some sympathetic strikes occurring in the Connellsville region, where many union miners have been working of late.

The local market has turned remarkably soft. While most operators continue to quote former asking prices of $2.10@$2.20 for steam mine run, there have been sales in the past week as low as $1.80, and $1.90 has been a common figure. It is generally assumed that sales under $2 are usually of coal mined under special wage conditions, although at mines formerly considered union, it being still believed that $2.10 approximately represents cost under the U. M. W. scale. Connellsville coal has been very hard to sell, and ordinary coking coal has been offered down to $1.60 in some cases, steam being commonly quoted $1.50@$1.60, this coal being at a freight disadvantage, as compared with Pittsburgh.

The conclusion in the trade as to the decrease in coal demand is that consumers were forehanded in laying in stocks and have in most cases now gone as far as they think necessary.

EASTERN OHIO

Notwithstanding the development of market inactivity generally, the output during the week ended March 11 was 390,000 tons or approximately 62 per cent of rated capacity. This is 6,000 tons above the preceding week and is greater than the output since the first week in November, at which time artificial market conditions also prevailed by reason of anticipated labor difficulties on the railroads.

The chief mainstay to production was the demand from the railroads. Carriers are making light repairs to "bad order" gondola equipment sufficient to permit a run to the mines for track storage purposes. It is claimed that the railroads will have at least a 60 days' supply ahead by the close of the month and some who have been storing on the ground as well as in cars, even more.

Although a coal strike on April 1 now appears inevitable, it has afforded little stimulus to activities in the trade. Demand tapered off during the week, and, if anything, now borders on dullness. Prices have softened slightly.

Receipts at Cleveland during the week ended March 11 amounted to 1,645 cars, divided 1,214 to industries, 431 retail yards; as compared with the total of 1,516 cars the preceding week.

NORTHERN PANHANDLE

Aside from railroad fuel shipments the only demand is from those few consumers who still continue to stock in anticipation of a strike. Mines running on a non-union basis are securing more business than organized operations. Owing to the uncertainty of the future, comparatively few contracts are being made.

Cincinnati Gateway

Heavy Stocks and Expected Cost Cuts Limit Buying

Steam Users Purchase for Requirements Only—Inquiries Active, Orders Few—Low-Volatile Shipments Too Heavy for Market—Prices Slipping.

THE approach of the date set for the strike has failed to keep buyers in a purchasing mood. Heavy stocks, the probability of mine cuts and freight reductions to come are causing steam consumers to question the wisdom of taking more fuel than is needed for current requirements. There is no dearth of inquiries, however, but actual orders are few.

Low-volatile shipments have been too heavy for the market and prices are slipping. Western points have an increasing tonnage on demurrage, as buyers appear to have satisfied their needs. The domestic market is stagnant while household buying has eased with the appearance of warm weather.

CINCINNATI

A combination of warmer weather and a stalled demand has overweighted this market to a point where price concessions are forced in order to stimulate business, but even with cuts on practically all offerings but steam coal there has been but little revival of the disposition to trade that was shown a month ago. Mails to most of the selling agents here are still burdened with inquiries but there is little "kick-back" in the form of actual sales.

The smokeless situation again was brought down a peg by the stagnation that followed the glut of coal thrown on the market to catch up with the orders a few weeks ago for prepared sizes. A cut on lump and egg has not produced more orders. Run of mine, too, has been stagnant. A few purchases by byproduct plants bolstered up the nut and slack situation and raised it to the dollar level and up.

Nut and slack and steam coal generally still has the center of the stage in the high-volatile division. Gas companies and utilities are the heavy purchasers. No word is being spoken on contract prices.

There has been no change in the retail prices. Business locally has fallen perceptibly and a revival of price cutting to end up the season is not unlikely.

SOUTHEASTERN KENTUCKY

Production and prices are being maintained. There is a good deal of anxiety being manifested over the strike situation.

About 20 mines in the Bell-Harlan fields have recently signed agreements with the 19th District, providing two years' work on the 1917 scale of pay. This is the rate of pay in effect at most of the mines in this field at the present time. It now remains to be seen whether the balance of them will follow suit or endeavor to make separate contracts with their men.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

New River shipments have been so greatly in excess of the demand that there is more or less tonnage on the market without buyers, with the result that prices are weaker. Consumers appear 'o have stocked sufficiently to meet a strike situation.

Gulf mines continue to operate about four days a week, production being around 60 per cent of capacity, with labor shortage cutting down the output to some extent. Prices are virtually unchanged, with the demand for steam grades less brisk than it has been heretofore. There is comparatively little prepared call.

POCAHONTAS AND TUG RIVER

Railroad disability is affecting Pocahontas production to the extent of 25,000 tons a week. As it is, however, as much coal is being produced as at any time during the war period. Some of the tonnage is on demurrage in the West, owing to the fact that the supply is in excess of the demand. Steam markets are far below the usual pre-strike activity and quotations are somewhat weaker.

Tug River mines are holding their own from the standpoint of production, with approximately 100,000 tons moving each week. Even a slight weakening of the market for steam grades has failed to check production. An improvement in the steel business of course has something to do with the maintenance of production in this territory. Prepared is in light demand.

HIGH-VOLATILE FIELDS

KANAWHA

Kanawha mines are making no headway owing to a poor demand for virtually all grades. Prices are so low that operations are precluded at nearly all mines except where there has been a reduction of wages. Consumers, even including utilities, have secured enough coal to tide them over a strike emergency and in many cases are retiring from the market. Operators are preparing to adjust wages or at least to announce an adjustment, without regard to officials of the United Mine Workers.

LOGAN AND THACKER

Production in the Logan field continues at a rate of more than 300,000 tons a week. There is scarcely any demand for the domestic grades but producers are moving a large volume of steam coal although on the whole there is less market interest shown.

Williamson mines continue to produce more than 120,000 tons a week. The rate of output is 60 per cent of capacity or about the same as in smokeless territory. A car shortage is handicapping producers to some extent. Railroads are securing a fairly large tonnage and contract coal is moving in good volume to utilities. The general demand, however, is not particularly brisk.

NORTHEASTERN KENTUCKY

As steam buyers become stocked for the strike they are dropping out of the market or at least reducing their requirements. There has been a decided recession in demand with a resultant weakening of prices. Even public utilities have ceased to buy on so large a scale. However, production is in excess of 55 per cent of capacity.

West

SALT LAKE CITY

Retail business continues good. The mines are doing as well as could be expected in view of the virtual closing of the Pacific Coast markets to Utah coal. Operators still find it difficult to obtain market for slack, but it is hoped that the industrial situation will soon be such that more slack will be consumed. There are already signs of renewed activity in the metal mining and smelting field.

DENVER

Operators of Colorado, while hoping to avert a strike, nevertheless feel that they will be involved if miners walk out in the Middle West in conformity with a proposed strike of nation-wide character.

Included among the demands — six-hour working day, double pay for Sunday and holiday work—of the several union camps in Colorado are those similar to the national demands. This is the inference drawn from a formal notice served on the Colorado State Industrial Commission that unless new agreements are reached a strike will be called April 1.

Cold weather has brought about a steadier market. Mine prices are about the same, bituminous lump bringing $5 and $10.25@$10.75 at retail. Louisville lignite lump is $4 at the mine and $8 retail, while Weld County lignite is $3.50 at the mine and $7 retail. This grade, however, is selling as low as $6.25 retail.

Lignite steam is bringing $1@$1.25 at the mine, and $4@$4.50 l.c.l. at destination, while Trinidad steam is $2.25 at the mine and $6.65 in small-lots delivered.

KANSAS CITY

There is little doing in the coal trade, as most all of the steam plants have put in stocks sufficient to carry them for from one to three months and with the non-union fields to call on, there is very little apprehension felt over the approaching strike.

There is a quietness that is ominous in view of the battle that will start April 1 and it is a safe bet that the cost of producing coal will eventually be lowered as until it is done the operators can make more money, or rather lose less, by not operating than by running their mines. No material change has occurred in prices from last week.

News Items From Field and Trade

COLORADO

The Colorado Fuel & Iron Co. reports for 1921 gross earnings of $27,485,938, against $51,812,813 in 1920. After all charges, including interest, depletion, depreciation and inventory adjustment, there was a deficit of $2,731,172. against a surplus of $1,286,806. After payment of dividends the deficit was increased to $3,404,669. The profit and loss surplus on Dec. 31, 1921, was $1,484,186, against $5,118,026 at the close of 1920.

ILLINOIS

The holdings and property of the mine of the **Kanawha Fuel Co.**, at Duquoin, are being sold by auction. The funds will go to pay off a debt owed to former employees of the concern.

The Manhattan Coal Co., Peoria, has announced its intention of sinking a new mine just east of Peoria. Work will be started as soon as weather conditions will permit and the mine will employ in the neighborhood of 150 men at the start.

The Columbia Coal & Coke Co., of Springfield, has announced the opening of new offices at Chicago, in the Transportation Building.

The Spring Creek Mine, one of the largest in the vicinity of Springfield, has been purchased by George Reisch from Frank Reisch and Albert Reisch. It employs about 350 men and has been working regularly the past six weeks.

A luncheon of the **Chicago Wholesale Coal Shippers' Association** was held at the Great Northern Hotel recently. Larry W. Ferguson, vice-president of the association, was the chief speaker.

The By-Products Coke Corporation, in its annual report for 1921, shows a net loss of $1,295,235, after interest charges and adjustment of inventory. This compares with profits of $702,145 for 1920.

The Central Illinois Public Utilities Co., which is in control of all the public utility plants in the southern Illinois mining fields, has taken option on several thousand acres of land on the Mississippi near Grand Tower for the purpose of building a dam on the order of the one at Keokuk. This plant will be supplemented by one or two boosting stations in the coal fields, such as the one now at **Harrisburg**, to take care of the peak loads.

There is a "mysterious stranger" among the coal men of Chicago. His name is **C. W. Neff.** Mail is continually received for him at suite 407 McCormick Bldg. and frequent callers there ask to see him. However, nobody has ever been ushered into his office and his mail is handled along with other **"C. W. & F."** correspondence. The name painted on the door of the suite is the well-known Chicago, Wilmington & Franklin Coal Co.

KANSAS

A 5-ft. vein of coal has been located on the Perry White farm, northeast of Parsons, and the owner intends to sink a mine shortly. The coal is 120 ft. deep with a good roof and the vein is 62 in. thick.

The Chamber of Commerce is urging the use of Leavenworth mined coal in a "trade at home" movement. There are 500 coal miners employed at present by the Leavenworth mines and the payroll averages $75,000 a month. This is the largest payroll in the city. Inroads made by outside coal has occasioned this movement.

KENTUCKY

The Gordon-Miller Coal & Coke Co., in a suit filed, seeks to recover $1,500 from J. J. Blankenship. The plaintiff, describing itself as a corporation with a capital stock of $250,000, asserts that on March 10, 1919, Blankenship agreed to purchase 1,500 shares of the stock at $1 a share; that the stock was delivered to him, and that he sold 200 shares, but has never paid to plaintiff any of the $1,500 for the stock sold.

An agreed judgment was entered in a Louisville court recently for $15,000 in favor of the **Harlan Coal Co.** against the **Kentucky Collieries Corporation, the Antonio Coal Co.** and the **Path Fork Coal Co.**, jointly. The judgment in the coal case is in full satisfaction for a claim for $154,200 filed by the Harlan Coal Company for alleged breach of contract.

Fire recently destroyed the storage house and elevator together with hoisting engine and machinery of the **Ludlow Coal & Supply Co.**, at Ludlow. The damage to the building and machinery was estimated at $12,000.

The Castro Mining Co., Cary, has filed articles with the Secretary of State; capital $15,000; C. L. Gooch, **J. Y. Page and Frank** C. Martin are incorporators.

MINNESOTA

The **Northern Pacific Ry.**, in St. Paul, has advertised for bids for coal for two sections of that road—one from Mandan, N. D., to Helena and Butte, Mont., and one from Helena, Mont., to the Pacific Coast. Both sets are being opened today. The first calls for lump coal, from 1,350,000 to 2,400,000 net tons, besides smaller tonnages of washed nut, sizes 2 and 3, and washed pea, sizes 4 and 5, aggregating from 165,000 to 315,000 tons. The second calls for 1,800,000 to 2,000,000 tons.

MISSOURI

One of the largest coal deposits in Missouri has been uncovered at Deepwater and a company will be formed at once to mine it. It is estimated that the field contains 5,000 tons to the acre or 1,000,000 tons in the entire field. **The Progress Coal Co.** owns the land on which the coal was found.

Suit has been brought by the **Home Coal Co.** against the City of Macon for recovery of $4,201.51, alleged to have been collected by the municipal electric light department as an overcharge for electricity in operating the mine for the last four years.

NEW YORK

Under the plan of reorganization authorized by the creditors, the **Creditors' Committee of the Interstate Coal & Dock Co.** has organized under the laws of Maine a new corporation to be called **Interstate Coal & Dock Co.** This company will have an authorized capital stock, consisting of 7 per cent cumulative preferred stock, of the par value of $3,000,000, and 50,000 shares of common stock of no par value. All the property and assets of the old company have been transferred and conveyed to the new corporation, including 9,600 shares of the capital stock of the Low-Volatile Consolidated Coal Co. of West Virginia, which was pledged to certain creditors. Voting trust certificates representing preferred stock in the new company will be issued to creditors having liquidated claims in amounts to be fixed by Special Master Williams, and voting trust certificates representing common stock will be issued both to creditors having liquidated and unliquidated claims and also to stockholders of the old company. Officers of the new corporations are: E. M. Poston, of Columbus, president; William G. Mather, Cleveland, and Charles A. Hinsch, Cincinnati, vice-presidents; C. H. Mead, Beckley, secretary-treasurer and general manager, and F. K. Pendleton, New York City, general counsel.

The Coal Trade Club of New York held a luncheon on March 15 at the Whitehall Club, New York City, the meeting being well attended. The members were addressed by A. F. Corwin of the Metropolitan Trust Co., who spoke on "Credit." F. R. Wadleigh, Chief of the Fuel Division Department, Foreign and Domestic Commerce, Washington, D. C., has promised to give an address at an early meeting of the club.

Robert Hager, president of the Hager Coal Co., Cincinnati and **F. U. Fisher**, of the same corporation, were visitors to the New York coal market to look over the eastern and shipping situation.

A judgment has been found in Supreme Court at Buffalo against the **Fidelity Coal & Coke Co.**, Pittsburgh, in favor of **Harold C. Seitz**, Buffalo, for $27,315.56.

The offices of **Whitney & Kemmerer** and **Dickson & Eddy**, at Buffalo are being moved from the Marine Trust Bldg. to the Prudential Bldg.

OHIO

The towboat Helper, one of the **Campbell Creek Coal Co.'s** fleet, capsized in the Ohio River last week, drowning two people who were on board.

The Brooks Coal & Supply Co., Cleveland, has been chartered with a capital of $50,000 to deal in coal and supplies. Among the incorporators are T. C. Brooks and W. O. Roehl.

W. E. Darnaby, formerly secretary of the Southeastern Coal Co., is now connected with the Eagle-Elkhorn Coal Co., having been succeeded by **Ray O'Connell.**

The Wheeling & Cleveland Coal Co., Bridgeport, has been incorporated with capital stock of $50,000 by M. V. Frazier, A. Dittrich, R. J. Bryan, Thomas J. Jordan and David H. James, for the purpose of developing coal properties near Bridgeport.

The W. S. Jennings coal interests of Virginia and Kentucky, will operate a sales office in Cincinnati in charge of W. S. Denham, formerly in charge of Western sales for the Carter Coal Co. The Jennings group of Kentucky mines are in the Hazard district and the sales of some of these are under agreements still to run but will be under the supervision of the new department.

Fred Legg, president of the Logan & Kanawha Coal Co., of Cincinnati, gave a quart of his blood to be transfused in an effort to save the life of his brother Edwin, who had been injured in a railway accident. The effort was unavailing, the victim of the mishap dying a week later.

The Paramount Coal & Coke Co., Cleveland, has been incorporated with a capital of $25,000 to deal in coal and coke both at wholesale and retail. Incorporators are R. F. Andrie, H. C. Yandt, D. C. Griffith, E. I. Pierson and F. B. Steif.

PENNSYLVANIA

Production in the **Fifth Bituminous District**, according to a report just completed, fell off in 1921 more than three million tons. The exact figure was 3,525,268 tons. The total for 1920 was 6,610,355 tons. A like drop is shown in the tonnage for the **Ninth District**, the decrease over 1920 being exactly 3,059,321 tons. Coke production for the two districts also showed a heavy drop, the difference being more than a million tons.

The Westinghouse Electric & Manufacturing Co. has transferred to the **Monarch Fuel Co.**, Latrobe, the coal right on 1,221 acres of land situated along the Bessemer & Lake Erie R.R. The consideration, according to the deed, was $733,000.

W. F. Sekol, consulting engineer of Scranton, has been engaged by the Northumberland County commissioners to fight the anthracite corporations in an effort to retain an increase in coal assessments in that county. In the past the coal assessment has been $37,000,000. The county commissioners boosted it to $93,000,000. The coal companies have announced their intention to fight the increase.

The Continental Insurance Company of New York and the Fidelity Phenix Fire Insurance Company of New York, recently filed a petition with the U. S. District Court, asking leave to withdraw their suit which sought to set aside the sale of the **Lehigh & Wilkes-Barre Coal Co.** to the Reynolds syndicate. The petition says that the two companies, who based their suit on "information and belief," think the answer filed by the Central Railroad of New Jersey, is correct and that there was no substantial difference between the bids of the Reynolds syndicate and the Franklin Securities Corporation. Since the filing of the answer and examination of the balance sheets, the petitioners think they are not justified in proceeding. This action leaves a similar suit brought by Isaac Starr, a Jersey Central stockholder, pending.

A total of 3,803,073 tons of coal was produced in the **Fifteenth Anthracite District** in 1921. The number of tons shipped is reported as 3,167,253, while the number of tons sold locally and consumed by employees was 145,921.

A charter has been issued to **W. H. Hughes & Co., Inc.**, Altoona. The purpose of the company is mining, preparing and shipping coal. It has a capital stock of $300,000 and E. C. Broomer, Altoona, is the treasurer of the company.

The commissioners of Dauphin County and the **Philadelphia & Reading Coal & Iron Co.**, have reached an agreement regarding the valuation of the company's lands in East Hanover, Ruch, and Middle Paxton townships. The county's expert recommended that valuation be raised $900,000, but the agreement was that the old valuation of $116,905 should be increased by $50,000. Taxes for 1919-1922 inclusive will be paid on this basis, and a dispute which has lasted for several years is ended. Counsel for the Reading pointed out that their Dauphin County lands do not contain workable coal, as tests had proved the coal to have been crushed badly by the tilting of the rock strata. In Columbia County, the coal lands (Conyngham township and Centralia borough) have been assessed this year at $22,000,000 an increase of $20,000,000 over the last valuation.

Production in the **Third and Fifth Anthracite** mine districts during 1921 was nearly 5,000,000 tons, according to the annual reports of inspectors just submitted. In the Third District, 2,845,977 tons were produced, and 2,518,230 shipped to market. A total of 2,056,209 tons was produced in the Fifth District.

There is considerable more activity in the Connellsville coke region. **The Century Coke Co.** has fired 50 additional ovens, making 86 out of 205 now in operation. **The American Coke Corporation** has fired some additional ovens at the Martin plant, making 142 out of 240 ovens at that plant now in operation. **The Republic Iron & Steel Co.** are preparing to start their Martin and Bowood mines.

Stockholders in the **Lehigh Coal and Navigation Co.** expect to receive a 10 per cent stock dividend within a short time. At a recent meeting in Philadelphia all of the directors who served during the last year were re-elected. The meeting also approved all the policies of S. D. Warriner, president of the company.

The Baltimore & Ohio will construct a siding from the Somerset and Cambria branch to the new mines of the **Somerset-Cambria Coal Mining Co.** just north of Somerset. The Somerset-Cambria company started to sink a shaft on Jan. 14. A tipple is now being erected.

The Producer's Coal & Coke Co., with offices in Johnstown has opened a branch office in Pittsburgh, which has been placed in charge of George D. Breck.

The affairs of the **Grazier Coal & Coke Co.**, one of the oldest corporations of its kind in central Pennsylvania, are in the process of liquidation for the benefit of the stockholders who are the heirs of the late John A. Grazier and H. F. Grazier. The corporation will be reorganized by Mrs. Jessie F. Grazier and F. J. Gromley, and will be continued. Mr Gromley has had many years of experience in the business and at present is the manager of the Garfield & Proctor Coal Co. Miss Frieda Miller will act in the capacity of treasurer.

Fire broke out recently in the tipple of the Cokeburg Junction Mine of the **Acme Coal & Coke Co.**, near Bentleyville, and destroyed about one-third of the structure, causing a loss estimated at $1,000. The origin is not known.

The newly uniformed special police officers of the **Hudson Coal Co.** made their first appearance a short time ago. The uniform adopted is similar to those worn by the state troopers.

Production fell off over 3,000,000 tons and coke nearly 1,500,000 tons in 1921, as compared with 1920, in the **Ninth Bituminous District**, according to the annual report recently made public. Production in aggregate by tons was:

	1921	1920	Decrease
Coal	2,114,015	5,173,336	3,059,321
Coke	595,325	2,031,132	1,435,808

Production in the **Eleventh Bituminous District** for 1921 was 4,094,901 tons, a falling off of 1,454,225 tons from 1920. The district is entirely in Westmoreland County.

TENNESSEE

The Mercantile Coal Co., with offices at Knoxville and mines at Nick's Creek, at which place it has a lease on 1,200 acres of coal land which carries the Dean seam, has just about completed its new tipple and equipment and will be ready to ship coal within the next few weeks. This company will have, when completed, one of the most up-to-date operations in the state.

TEXAS

The entire plant of the **Lockney Coal & Grain Co.** was destroyed by fire of unknown origin. The loss will amount to $25,000 with insurance of $15,000. Announcement is made that the plant will be rebuilt at once.

Bruce Gentry, of Rockdale, has been re-elected as state mining inspector by the Mining Board in session at Austin.

The Consumers Lignite & Fuel Co. has been organized at San Antonio, and has begun operations on an extensive scale in Bastrop County, near Bastrop. This is the twelfth coal mining company to open mines near Bastrop, and coal is now being shipped from that point to all parts of Texas.

The Galveston Coal Co. is now bringing coal for bunkers from Mobile to Galveston via barge. The Galveston company heretofore shipped its coal from Virginia on steamers, and it is found that the fuel can be brought much cheaper on barges from Mobile.

UTAH

Frank N. Cameron, vice-president and general manager of the Liberty Fuel Co., Salt Lake City, has been elected to the same office with the Utah Fuel Co. Mr. Cameron is one of the best known figures in the coal mining circles of the mountain country. He was the founder of the Cameron Coal Co. He will have as his assistant **C. B. Hotchkiss**, former assistant to the president of the W. P. Railroad. **L. R. Weber** will succeed Mr. Cameron at the "Liberty."

The Utah Coal & Coke Co. has filed its valuation report, showing 2,774.18 acres of coal land in Carbon county worth $381,634.73.

The Spring Canyon Coal Co. reports a valuation in Carbon County of $656,453. The company has 2,071.3 acres of land.

VIRGINIA

Members of the **Newport News Coal Exchange** are conferring with officials of the exchange relative to adjustment of differences which have arisen over the assessment of demurrage charges. The members claim that the tariffs have been improperly applied, and that there is an irregularity in the manner in which cars have been reported on demurrage. Some shippers claim that the time of arrival of cars has been estimated, rather than checked on actual arrival, and that demurrage charges have been made on this basis. It is said approximately $100,000 is involved in the controversy.

E. I. Ford, manager of the Consolidated Pocahontas Coal Co., Newport News, has returned from Washington where he had been in conference with railroad officials and with representatives of the Newport News Coal Exchange.

W. L. Petty, former head of his own coal business and now a member of the firm of George W. Taylor & Co., coal and ice dealers, has been elected president of the Lion's Club of Norfolk, and made governor of this district for the club.

A petition signed by 6,000 Saline County coal miners, asking for the removal of Thomas English as State Mine Inspector for that district, has been forwarded to Governor Small. The antagonism against English started in the Harco local and spread to practically every mine in the county.

WEST VIRGINIA

The present plans of the **Consolidation Coal Co.** call for the sinking of additional shafts near Coalwood, operating headquarters for the company in the Pocahontas region. Several hundred additional houses will be constructed. Owing to the growing importance of Coalwood, the Chamber of Commerce of Welch is behind a movement to construct a paved road from Welch to Coalwood.

The Babcock Coal & Coke Co. is firing more ovens in Fayette County, there being 60 ovens in all in operation. With additional ovens in blast it has become necessary for the company to produce coal on a larger scale from its Cliff Top mines in Fayette County.

Benjamin Bissell of Baltimore, general manager of the Century Coal Co. which operates at Century, was a recent visitor in the Fairmont region.

Walter C. Romine, of Fayette County, must serve a term of six years in the West Virginia penitentiary, having been found guilty of dynamiting and wrecking the power station of the **Willis Branch Coal Co.**, on the night of Feb. 15, 1921. Testimony adduced by the state showed that fully 25 men took part in the attack on the power station and that Romine acted as a leader. Several implicated in the disturbances about Willis Branch are now serving terms in the penitentiary. The case will be appealed.

C. H. Jenkins, secretary and treasurer of the Hutchinson Coal Co., has returned to his home at Fairmont after spending a few weeks with Mrs. Jenkins in Florida.

The newly appointed secretary of the Standard Tide & Inland Coal Sales Co. is **H. W. Leet**, who has been in charge of the coal department of the Ashland Coal & Iron Co.

The Kingmont plant of the **Virginia & Pittsburgh Coal Co.** in the Fairmont region is being completely electrified. Power is obtained from the Monongahela Power & Railway Co.

The Davis Colliery Co. announces that **W. B. Bradford & Co.**, of Philadelphia and New York, have been appointed Eastern sales agents for the company's Jontee Copen coal, which is mined near Gilmer, on the Baltimore & Ohio.

Re-election of the old officers and directors of the **Atlantic Smokeless Coal Co.**, of Davis, took place at the annual meeting of this company held a few days ago. General satisfaction was expressed with the showing made by the company as covered in the annual statements and reports. The following officers were re-elected: George Wolfe, of Beckley, president, general manager and treasurer; Dr. J. Howard Anderson, of Marytown, vice-president; W. M. Black, of Lynchburg, Va., secretary.

The American Coal Co. announced, following the annual meeting of the company in New York a few days ago, that contracts had been closed for a new tipple to replace the old Crane Creek plant. The new plant will be one of the largest in the Pocahontas field, with a capacity of 400 tons an hour. This company will be one of the first to install an innovation known as the American Dry Cleaner. It replaces the washery and cleans coal by holding it in suspension by air instead of by water. A much more thorough preparation of the coal is accomplished, while doing away with the water problem.

Fire completely destroyed the tipple of the **Ashland Coal & Coke Co.** at Ashland, McDowell County. The loss sustained is estimated at $40,000, said to be fully covered by insurance.

There are several plants in northern West Virginia, it is understood, which recently resumed operations on a non-union basis. One of such plants is known as the Abbott Mine, operated by Byrdon Brothers, this mine being near Belington in Barbour County. Another report is to the effect that the **Salkeld Coal Co.**, also near Berlington, is working on a non-union basis.

Such coal land as underlies the right of way of the Morgantown & Kingwood Ry., operating in Preston and Monongalia counties, has been transferred to the **Penn-Mary Coal Co.**, identified with the Bethlehem Steel Co. The Morgantown & Kingwood was formerly owned by the Elkins estate but was sold to the Bethlehem several years ago and is now owned or leased and operated by the Baltimore & Ohio.

The Jamison Coal & Coke Co., operating in Pennsylvania and West Virginia has acquired a tract of 728 acres of Pittsburgh coal in Marion County, adjoining the present holdings of the Bethlehem Mines Corporation. According to current report, the consideration involved was $500,000. In the tracts acquired were 443 acres owned by Phil Sesler, 134 acres owned by Jancy J. Trader, 94 acres owned by Mary Collier and 56 acres owned by Margaret Sesler. The tract acquired is said to be one of the best tracts of Pittsburgh coal in the field.

W. A. Marshall & Co., of New York, has been appointed as sales agent of the **Soper-Mitchell Coal Co.**, of Morgantown.

R. M. Lambie, chief of the Department of Mines of West Virginia, declares that the number of fatal accidents in the coal mines of the state were greater in February than in any month since last April. Speaking of the number of accidents in the industry last year he states there was one fatality for every 261,000 tons of coal mined. Lack of education is attributed by the mine chief for the increase in fatal accidents.

The Cleveland Cliffs Iron Co. is busily engaged in putting up a new steel tipple at its plant at Ethel in the Logan field. The company expects to have this tipple in operation before long and through the use of such new equipment to materially increase its daily loading capacity.

WASHINGTON, D. C.

In reporting the army appropriation bill the House Committee on appropriations refused the army an appropriation of $20,000 which had been recommended for the construction of a coal trestle and bin at the Aberdeen, Md., Proving Ground. The bill also limits the army to $3,000,000 for the purchase of fuel for the coming year.

As an example of the effectiveness of vocational training, the **U. S. Veterans' Bureau** cites the case of a disabled coal miner who, at the completion of his vocational training, was able to take and successfully hold a position as mine foreman at $2,100 a year. Before the war, as a coal miner, previous to his disability he received $1,200 a year.

Both House and Senate have passed a bill to permit **agricultural entries on coal lands in Alaska**, and it now goes to the President for his approval.

The Navy Department has formally requested the Interior Department to take over the mining of coal at the Chickaloon Mine, at which experiments have been conducted recently. The formal transfer will probably be effected prior to May 1. On the ground that it is a mining function with which the Navy is not concerned, Secretary of the Navy Denby recently advised the House Committee on Appropriations that if it were determined that suitable Navy coal could be obtained in Alaska, that it should be mined by the Interior Department or by private contract. Secretary Denby says that outside of an emergency the use of Alaskan coal for the Navy would be contingent upon delivering coal at Pacific ports at a cost equal to or less than the cost to the Navy of coal near the Atlantic coast. Assuming that the price differential would favor the Alaskan coal he says there are two ways of making it available for Navy use—by arrangement with the Interior Department to mine the coal, stipulating a minimum delivery required under emergency conditions, or to contract with private parties for mining coal under a minimum output delivered to the Navy on demand, and in the absence of Navy use, to be sold in the open market.

Substitution of bituminous coal for anthracite for use at army posts, camps and stations, is being accomplished by the War Department as an economy measure in view of the high prices for anthracite. The Quartermaster General of the Army, in charge of fuel has been forcing the use of bituminous coal everywhere. Representative Anthony, of Kansas, in charge of the army appropriation bill, before the House, commended the army for fuel economy, saying that when anthracite prices go beyond a certain price the use of this coal is extravagant. He made the statement in connection with a report by army authorities that at Fort Riley anthracite stove cost $20.17 a ton, while bituminous cost only $7.

The average price paid for bituminous coal at the mines this year by the army has been $3.33 a ton and $6.38 delivered, and for anthracite $9.33 at the mines and $11.83 delivered, while some few quantities had been purchased as low as $2.50 and $2.75 a ton.

Before the U. S. Supreme Court on March 20 re-argument was heard in the appeal of the United Mine Workers of America from the decision of the lower courts which awarded treble damages under the anti-trust law in favor of the **Coronado Coal Co.**, for damages to the coal company's property during a strike in Arkansas several years ago. The union denied that it was a legal entity subject to the suit and fine in its argument. James B. McDonough and H. S. Drinker, Jr., argued the case for the coal company, urging that the lower court award of damages to it be affirmed.

Traffic News

The case of the **National Retail Coal Merchants' Association** against the Baltimore & Ohio, et al., for resumption of re-weighing and re-screening at Tidewater loading points for domestic and anthracite coal, is assigned for hearing on April 7, 10 a.m., at Chamber of Commerce Rooms, Philadelphia, before Examiner H. J. Wagner.

W. W. Houston, of the Panhandle Coal Co., chairman of the committee of twenty-one former shippers through the **Lambert's Point Coal Exchange**, who petitioned the I. C. C. to investigate the manner in which tariffs regarding demurrage charges were being applied at that exchange, is in Washington attending the hearing on this case. Approximately $500,000 is involved in the demurrage charges in question. The shippers contended that either the demurrage charges were not being applied properly at the exchange or that the charges were too high. Pending the outcome of the hearing the Norfolk courts were asked for an injunction restraining the Norfolk & Western, operating the exchange, from collecting the demurrage charges due. A further contention is that the charges were placed against the shippers rather than against the exchange.

In the complaint of the **Minnesota By-Product Coke Co.**, the I. C. C. decides that the rates on coke from St. Paul to points in South Dakota, Iowa, Illinois, Wisconsin and Michigan are unreasonable. It prescribes the following rates from June 6: from St. Paul: Mason City and Charles City, Ia., $2.43; Waterloo and Fort Dodge, Ia., $2.97; Marshalltown, Cedar Rapids and Des Moines, Ia., $3.105; Sioux City and Clinton, Ia., $3.51; Council Bluffs, Ia., $4.05; Chicago and Moline, Ill., $3.51. The rates from St. Paul to all points in South Dakota east of the Missouri River are not to exceed rates constructed on the basis of the distance scale of rates on coke in effect from Duluth to the same territory. In the same case the commission holds that the Minnesota intrastate rates on anthracite were not shown to have been an appropriate measure of the rates on coke from St. Paul to Minnesota points during Federal control.

The commission has reopened the case involving reduced rates on coal to Kansas City, Mo., for further oral argument, which will be held at Washington March 30.

In the complaint of the **Minnesota Steel Co.**, an I. C. C. examiner recommends that rates on coal from Missabe Junction to Steelton, Minn., during Federal control were not unreasonable.

Obituary

The body of **James E. Lambert**, 50 years of age, salesman for the Diamond Coal Co., Hazard, Ky., was brought to his home in Louisville following his sudden death at Rochester, Minn.

Andrew Baile, one of the most prominent coal merchants of Montreal, Canada, died on March 11, after two years illness, at the age of 80 years. He was born in Quebec and came to Montreal in 1869 where he engaged in the coal business. Mr. Baile was active in philanthropic work and was a life governor of the Montreal General Hospital.

William H. Richmond, retired coal operator and philanthropist, of Scranton, Pa., died recently at his winter home in Daytona, Fla.

Association Activities

Northern West Virginia Operators' Association

As the outcome of an exchange of telegrams between the advisory board of the association and C. F. Keeney, president of District 17, United Mine Workers, a meeting of the members and directors of the association was held at Fairmont on March 11 for the purpose of selecting representatives of the operators. It was decided to name the entire scale committee of the association to confer with the representatives of the miners at Baltimore.

Upper Potomac Coal Operators' Association

Directors and officers were elected at the annual meeting of the association held a short time ago in Cumberland, Md. Directors elected were: Truman M. Dodson, Bethlehem, Pa.; James A. Brown, Frostburg, Md.; R. A. Smith, Blaine, W. Va.; Douglas Gorman, Baltimore, Md.; Carroll Pattison; W. E. Ambrose, Cumberland, Md.; J. G. Emmons, Philadelphia; R. Marsh Dean, Elk Garden, W. Va.; A. Spates, Brady, Elkins, W. Va.; S. D. Brady, Fairmont, W. Va. The board chose the following officers: T. M. Dodson, president; James A. Brown, vice-president; John F. Palmer, secretary, and R. A. Smith, treasurer.

During the meeting market conditions affecting the industry and wage matters were discussed in an informal way.

At a banquet following the business session, Maxwell C. Byers, president of the Western Maryland, was the guest of honor and principal speaker.

Publications Received

The National Retail Coal Merchants' Association of Philadelphia has issued a booklet entitled **A Simplified Uniform Accounting System for Retail Coal Merchants.**

Annual Report for Year 1920 of State of Alabama, by C. H. Nesbitt, Chief Mine Inspector, Birmingham, Ala. Pp. 90; 6 x 9 in.; tables.

Annual Report of Iowa for the Biennial Period Ending Dec. 31, 1919, by W. E. Holland, R. T. Rhys, Edward Sweeney and L. E. Stamm, State Mine Inspectors. Pp. 48; 6 x 9 in.; tables.

Coming Meetings

American Institute of Electrical Engineers will hold its spring convention at Chicago, Ill., April 19-21. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

National Coal Association will hold its annual meeting at Chicago, May 24 to 26. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham.

Virginia Coal Operators' Association will hold its annual meeting April 15 at Norton, Va. Secretary G. D. Kilgore, Norton, Va.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

Chicago Coal Merchants' Association will hold its annual meeting April 11 at Chicago, Ill. Secretary, N. H. Kendall, Plymouth Building, Chicago, Ill.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 26 and 27 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Fidelity Trust Bldg., Indianapolis, Ind.

The readiness of many Midwestern miners to strike was evidenced last week when the men in one mine protested against a certain state mine inspector because that official did not compel the company to maintain the workings as they should be. For one thing entries were not cleared fast enough. The company president visited the place. He offered his men a chance to do the clearing and they refused. He gave them three days. They did nothing. Then, believing the whole ruction was only an effort to get the inspector into difficulty, he closed the mine indefinitely.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

Volume 21 NEW YORK, THURSDAY, MARCH 30, 1922 Number 13

April 1, 1922

A TEST of the "full economic strength" of the United Mine Workers will begin this week. The depths that may be plumbed before the end is reached no one now can say. Every union miner and mine laborer in both anthracite and bituminous coal fields is ordered to cease work on March 31, the non-union miners are exorted to strike and railroad labor is expected to lend moral support and passive assistance to the cause of the striker.

The basic cause leading up to this greatest of all coal strikes in the history of the country is simple of understanding and easy to state. It is that the coal operators and the miners have not been able to agree on a scale of wages and a contract to replace that now expiring. The operators expect the miners to accept a reduction and the miners have refused; in fact in the hard-coal region they have demanded an increase of 20 per cent.

The employers of the union coal miners are not asking that their men take less wages because they are possessed of a diabolical desire to oppress the men. They are interested in having contented employees living decent American lives. But they cannot pay in wages that which they have not. The operators of the union bituminous coal mines cannot get their share of the going trade when they are obliged, because of high costs, to sell at prices well above those charged by operators of non-union mines at which costs have been reduced because of wage reductions. The coal producer likes to get a good price for his product, but when demand is limited, as in 1921, the buyer always takes the cheaper coal. In consequence, the union soft-coal fields fell upon hard times in 1921, affecting both employer and employee. The producer sold on contracts that afforded a profit, contracts made before prices took their tumble, or he sold at the market and took a loss, or he did not run his mine. If he worked his mine he paid the union scale of wages, because he was under contract so to do. But he is resolved that this year he will have a scale of wages that will enable him to produce at such a figure as will meet competition. There is no gain for either capital or labor in having the price of its product so high that it cannot be sold. That is what precipitated the present trouble in the soft-coal fields.

With respect to anthracite the situation is different, because there is no non-union competition. Here, however, the public, which has had to pay the inordinately high prices demanded by the producer to cover his cost with present high wages, has made and is making heard its protest. The pressure of public opinion for lower-priced hard coal for household use is tremendous, and it is this pressure that the operators are passing on to the miners in their wage conferences in New York at the present time.

The United Mine Workers, on the other hand, is opposed to participation in deflation. Having had for twenty-five years steady and almost continuous increases in wages—increases culminating in post-war rates of pay far in excess of anything ever before known in the industry—it seeks to retain its advantage. No one begrudges the miner the opportunity he had and exercised of sharing in the war and post-war prosperity of the coal industry. The quarrel of the American people with the union is that it refuses to recognize that those times are over, that the miner alone cannot stay where he rode on the crest of the wave when the wave has receded.

There are, of course, other angles to the situation. A large section of the soft-coal operators are opposed to the check-off and have announced that they will not agree to the continuance of this practice in future contracts. It is through the check-off that the United Mine Workers has attained its present great strength. A practice harmless enough in the beginning in helping to build the union up to a point where it could help stabilize the soft-coal industry, the check-off has become the main support in power of a union that upsets the coal industry. The courts have declared it illegal in some of its applications.

Just why the union thinks that it can the better gain its demands by negotiating with the bituminous operators in a group instead of in small units is not clear. The officials have determinedly set their face against any meeting of the local unions with the producers and are holding out for a national conference through the Central Competitive Field.

The miners are making a strong bid for sympathy with their oft-repeated and strongly voiced denunciation of the operators who have refused to participate in a Central Competitive Field conference. They are saying that this alone is the cause of the strike. This is but camouflage. It is a legitimate thrust at a weak spot in the operators' armor. But it is not the real cause of dissension and disagreement. That is the rate of wages. What must not be lost sight of is that, meeting in one group or in several, the operators demand deflation of wages. On the surface the bituminous coal strike is a controversy over procedure; in reality it goes much deeper and is concerned with the fundamental economic problem of wage readjustment.

In the anthracite region the controversy is already narrowed down to that very problem. Without hitch a conference was arranged and is in progress, but that fact has not interfered with the miners calling a strike of anthracite miners. Similarly, had the operators agreed to a Central Competitive Field Conference there would have been a strike there.

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The Dark Industry

JAMES J. DAVIS, Secretary of Labor, alighted on the above strange designation of the coal industry and presented it to the ladies of the National Civic Federation as one of the first of his contributions to the present labor situation. We say "one of the first," for he is likely to be a frequent contributor in the future.

The industry is "dark," even very dark, only because the public is either uninformed or misinformed about it, for no industry other than railroading has had a brighter and more searching light thrown upon it. Coal men believe that the light has been overglaring.

The light of the inquiry on "Waste in Industry" conducted without bias by the Federated American Engineering Societies showed up the fact that other industries worked as irregularly as bituminous coal mining and that most ran less steadily than the anthracite mines. But this has been overlooked by the public. We question whether the Federated Societies really caught the significance of this discovery, even though the figures formed part of the report. It was the bituminous coal industry that was first caught sleeping in the auditorium of industry, and the word went forth that it was the only one that ever nodded.

Many are the lights which have fallen on coal mining. The Bureau of Mines let a ray shine on its accidents and its failure to extract 100 per cent of the coal. A cross gleam came from the Geological Survey, exhibiting its irregular operation and its overdevelopment. Another from the President's Bituminous Coal Commission revealed the fact that in an unusually prosperous year after a decade of penury it made almost 10 per cent of profit. The Bureau of Labor has cast a stream of light on the frequency of strikes and a somewhat garish and uncertain light on wages.

Other lights fell on it that revealed it in an almost angelic mood. The Census showed it as an industry where mortality was unbelievably low—unbelievably we say, though coal men had always known it. The Bureau of Mines showed the coal-producing industry as frugality itself when compared with the coal-consuming industries. The Geological Survey by its record of the ebb and flow in the number of operative mines showed how free the bituminous industry was from any control by the leading coal-producing corporations.

The National Coal Association and some of the local trade bureaus have used their statistical facilities to ascertain the actual wages made by the steadily working and the inefficient, revealing—is this a beauty or a blemish—that the coal-mine worker is earning more for what he does for others than he is paying for what others do for him. And now the National Industrial Conference Board is showing how large is the increase in wage compared with the advance in the cost of living in mining towns.

There were other lights like the one shed by the Geological Survey which showed nothing either harmful or beneficent in the coal industry—namely, the growth and decline of coal stocks, the weekly outputs of the districts, the loss of output due to strikes, and the difficulties resulting from the inadequacy of the railroads. Few industries indeed have such weekly records and hardly any so complete.

After all these cross lights had illumined the coal industry we thought that no one would call it "dark." It remained for James J. Davis and William R. Ingalls to bring back to us the age-long truth that to the blind all things are dark or but faintly illuminated. The industry is indeed dark so long as the public has a blind eye. There can be no light for those whose understanding is thus obscured.

Preservatives and Mine Fires

GREAT BRITAIN'S problems in mine operation frequently shed a light on our own. The mines of that country are old, deep, warm, dry and filled with timber. The coal they contain is either peculiarly subject to spontaneous combustion or is so rendered by the crushing effect of its heavy cover. One of the predominant mining subjects for consideration in England today is mine fires.

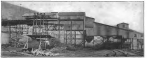
A general tendency in the same direction is noticeable in America. Our mines are mostly not as old, as deep, as warm or as dry as those in Great Britain, but conditions are gradually becoming parallel, and the literature of mine fires is increasing even here. Some of these fires, as those at Summit Hill, Carbondale and Frostburg, have been burning for years, but some are new. Not all indeed are deep. Many cannot be ascribed to depth, being surface fires, like those just named. But some seem to have clear relation to depth, especially those in metal mines.

The mine-fire hazard is becoming more menacing year by year, and with it comes the suggestion that the fireproofing of timber may prove of great advantage. The general opinion, based on imagination rather than on experience, is that the most generally used preservative —coal-tar creosote—is likely to add to the fire hazard, yet R. R. Hornor and G. M. Hunt, who have been investigating the subject for the U. S. Bureau of Mines and the Section of Wood Preservation of the U. S. Forest Products Laboratory at Madison, Wis., are of the opinion that "there is little evidence to show that the oil adds appreciably to the hazard except, perhaps, where the wood is fresh from the treating tank."

The authors mentioned say that "it is assumed, of course, that only those timbers will be treated that are to be used in working places which are to be kept open for a sufficient length of time in excess of the natural life of the timber to justify the use of treated timber."

In the West the fire hazard has been given more thought than in the East, especially since the Delagua fire, which started from the combustion of a mine door. At least as far back as 1912 the Union Pacific Coal Co. —and perhaps other mines also—made all its brattices and overcasts of concrete, had the miners cover the mine powder boxes with sheet steel, and in many instances kept explosives in the mine in concrete boxes. The timber problem, however, is larger than can be covered in this manner. Timber must continue to be used. If it is recovered it will pay to use preservatives. If it is broken and left, it may well be worth while to have it so preserved that it will not catch fire spontaneously.

But for the present our mines are rarely deep and the need of preserving timber for permanent roadways, especially return airways, is imperative, so that it is hardly likely at present that much consideration will be given to the preservation of any wood except that which is likely to be retained in service for at least a few years.



TIPPLE AT PARKERS RUN MINE; ELEVATORS ON SIDE USED FOR RAISING PIT PROPS TO TIPPLE HEIGHT

Parkers Run Tipple Has Two-Speed Picking Table, Prop Hoist and Boom to Feed Cars or Domestic-Coal Bin

Tipple Built to Run Either 200 or 400 Tons Per Hour—By Elevating Loading Boom Lump Coal May Be Delivered to Domestic-Coal Bin—Chain Lifts Raise Timbers and Rails from Supply Yard to Mine-Track Level

By Alphonse F. Brosky
Pittsburgh, Pa.

The tipple of the Parkers Run mine, belonging to the Fairmont & Cleveland Coal Co., is one of the best in the Fairmont region, and several unusual details are embodied in its construction. The framework is composed of structural-steel shapes supported on H-columns. The stairways are built of channel stringers provided with angle-iron clips, upon which rest inverted channels filled with concrete. Corrugated iron siding and roofing, with ample window lighting, provide a covering for the top and sides of the frame.

The equipment installed within the building is capable of handling 400 tons of coal per hour. Loaded trips are delivered on a level track to a chain trip feeder of 80-car capacity. This is driven by a 15-hp. slip-ring motor through a rubber belt and an adequate spur-gear reduction. As is customary, this machine is controlled from the dumping point through a friction clutch. The cars are fed one at a time over a track scale, passing thence to a Phillips crossover dump, where the coal is discharged to a receiving hopper. The empty cars pass from the dump to a kickback and thence gravitate to the empty track.

From that point a trip-maker elevates the empties individually over a slight grade to the level track, where the empty trip is made up for its return to the mine. The trip-maker is a duplicate of the trip-feeder, and one motor is utilized to actuate both machines. The trip-maker is driven from a countershaft of the trip-feeder through a steel thimble roller chain and spur gears.

From the receiving hopper the coal is fed to a picking table by an apron feeder driven from the table tailshaft. The feeder may be run to pass either 200 or 400 tons per hour. This arrangement is seldom made in tipples of this type. It possesses the advantage of maintaining a uniform flow of coal through the preparator whether the day's output be 3,000 or only 1,500 tons.

As the coal leaves the feeder it passes over a screen that delivers it to the picking table with the fine coal on the bottom and the lumps on the top. This separation facilitates picking. The table is driven at the rate of 60 ft. per minute by means of a 15-hp. slip-ring motor controlled automatically through push buttons.

No peculiar features are embodied in the screens proper. Arrangements are made so that sized coal may be loaded in cars of different depths of bed with a minimum of degradation. An emergency run-of-mine chute permits unsized coal to be loaded on the slack track without operating the shakers. By raising the loading boom to a feed chute, lump coal may be discharged onto an apron conveyor which carries it to a small storage hopper, which furnishes a supply of coal for domestic use. The arrangement is shown in Fig. 1.

Props Raised to Tipple Tracks by Chain Lift

The coal bed lies at tipple height and is thus above the elevation of the supply yard. An unusual means of raising the more generally used materials, such as steel rails, ties and mine props, to mine-track elevation has been adopted. This arrangement, as shown in the frontispiece, takes the form of a trestle built beside and on a level with the tipple approach. The trestle is of composite construction and was erected after the completion of the tipple proper. It is therefore independent of the preparatory structure. It carries a single track for supply cars.

Timbers and rails are elevated from the ground level by means of two supply elevators placed side by side. These consist of special steel chains provided with suit-

LOADING BOOM FEEDING DOMESTIC-COAL BIN
The loading boom is raised to the mouth of the chute shown in the center background, which discharges onto the apron conveyor extending to the right-hand corner.

able dogs for receiving the material. They are driven by a 20-hp. motor. The material is placed on the dogs at the bottom, and on reaching the top is discharged onto a curved skidway upon which it rolls or slides into suitably placed mine cars.

This tipple together with the supply elevators and receiving trestle was designed, fabricated and erected by the Pittsburgh Coal Washer Co., of Pittsburgh, Pa. The Sewickley bed, which runs 72 in. thick at this point, is worked at this plant, no great difficulties being encountered in its operation. The cost of mining consequently is low. Ordinary methods of mining or those adapted to normal conditions are followed, so that little can be said of the underground development. This mine is situated at Parkers Run, W. Va., a few miles east of Fairmont, and is connected with both the Baltimore & Ohio and the Monongahela railroads.

Lowering Cost of Room-Neck Switches

By Ralph W. Mayer
California, Pa.

In this day of standardization and quantity production it is interesting to learn that some mines have adopted a well-planned system of tracklaying that saves rail cutting, hunting for material, measuring of parts, waste and delay in the work and interference with the operation of the entry in which the room switches are to be laid. The rooms are turned on 36- and 72-ft. centers. Of course, other distances could be used with equal facility so far as the switch system is concerned, but these lengths meet the mining conditions. The rails as purchased are 30 ft. long. One or more of these is cut into 6-ft. lengths, the pieces being drilled at both ends for fish plates the same as are the regular track rails. A 30-ft. plus a 6-ft. length of rail then corresponds exactly with the distance center to center of rooms.

The exact location of the first room neck is carefully marked or given the trackmen before a single rail is laid in the entry. A 6-ft. length of rail is then placed on the room side of the track with its outby end in the exact location to be occupied by the room frog. A 30-ft. length of rail is then placed inby with its end butting against the end of the 6-ft. section already in place. On the outby end of the 6-ft. length it may be necessary in this instance to cut a rail to fit. By this means when the 6-ft. length of rail is removed a frog and a rail of the same aggregate length may be substituted, fitting the place exactly and being in proper position for the room track.

The track rail on the room side of the entry is then laid of 6- and 30-ft. lengths of rail alternating throughout its entire length. The 6-ft. sections thus come automatically opposite room necks and occupy the exact position which will be taken by the room frogs and short rails when the rooms are turned.

When the tracklayer is ready to lay a room switch, the proper 6-ft. length of rail is taken up and a frog and shorter rail slipped into its place. The end of the adjoining 30-ft. length is then bent inward to form the follower rail; the switch points and other parts are added and the job is complete. No rails need be cut when laying any of the switches on the entry.

Plate or built-up frogs are used. When a room has been worked out and the switch is to be removed, the frog and other switch parts are taken up, and a 6-ft. length of rail put in place. The 30-ft. rail which has been used as a follower is bent back in line with the entry rail and bolted and spiked into place. This leaves the track in exactly the condition in which it was before the room switch was laid.

When five adjoining rooms have been worked out, the 6-ft. lengths of rail may be reclaimed. After they are removed, the spikes holding the 30-ft. lengths are loosened and two of these lengths shoved endwise outby and the other two moved endwise inby until they butt against each other and the adjoining rails. This leaves a 30-ft. interval into which a corresponding length of rail may be fitted. All these lengths are then bolted together and spiked solidly in place.

By this means no time is lost either in laying or taking up a switch or in looking for, or cutting, rails to fit. Whole switches may be moved bodily from room to room and put immediately into place. As everything is made to standard it takes no longer to lay one switch than another. This saves both time and labor, the consumption of which in cutting rails to fit and bending them into place when following ordinary practice is almost unbelievable to one who has never attempted to do this kind of work.

There are from 25 to 50 miles of track in the average Illinois shipping mine, over which is operated the haulage system necessary to move coal, in so-called pit or mine cars, from the various rooms and entries, where it is mined, to the shaft where it is hoisted to the surface. For the lighting of these underground passages there is operated at each of these mines an electric plant of a capacity in excess of that required for lighting an ordinary town of 5,000 inhabitants. Such lighting plant is operated approximately throughout the entire twenty-four hours, being required during the working period for lighting the underground works and at night for lighting a large portion of the underground as well as the top works.

A large modern coal mine is in reality an underground city with a population, during working hours, of 500 to 1,000 men. Forty-five Illinois coal mines in the last year had an average of 651 employees.

Varying Track Gage and Bearings Would Not Prevent Standardizing the Mine-Car Running Gear

Cut the Axle in Two—Mount the Parts in Standard Bearings Bolted to a Standard Steel Channel—Use a Standard Steel Plate Riveted to the Channels to Keep the Four Wheels in Alignment

By F. H. Cadmus*
Detroit, Mich.

IN THEIR efforts to design and develop one new feature after another pertaining to the method of lubrication and to the means for the retaining of the lubricant after it has been applied manufacturers seem to have lost sight of the importance of the standardization of mine-car running gear. So today, speaking both of plain and roller-bearing wheels, there are many wheel constructions, with different methods of retaining the grease, etc. Both kinds of wheels seem to have their particular advantages and engineers favor one or the other according to the satisfactory results each one has had in the past with his respective kind of wheel. It now seems that mine-car running gear has advanced as far as it will for some time to come, in all features except standardization.

So many good constructions are to be had that the mine owner is at times influenced somewhat by price, and as a result of this condition has been led farther and farther away from the very point he must strive for in the future, namely, the standardization of his equipment.

Non-Standard Parts Costly and Cause Delay

In some cases the operators have different track gages in their different mines, due both to necessity and to the taking over, through consolidations and other financial transactions, of mines opened by others, so in addition to different types of cars there are sometimes different track gages and different models of the same type of car in the mines of a single company. From this, one can readily see where the mine operator is today as far as standardization is concerned.

Many operators in ordering repair parts for their cars must accompany their order by sketches showing the dimensions of the parts required. These parts, which should be made in quantity production, become special parts and must be sent through the shop as a special order. They not only cost much more than would standard parts but they take longer to make, for the shop must find an opening in its schedule, which in most cases is not within the week and sometimes not within the month. At any rate the parts are seldom received by the operator when he expects them and never when he wants them.

The above conditions force the operator to carry more parts in stock than if he had standard equipment, and these parts must in most cases be carried at the individual mine, as they are of use to that mine only. Operators probably could add much to what has been said already, for I speak only from observations I made while installing my production control system in a large plant, one of the products of which was mine cars.

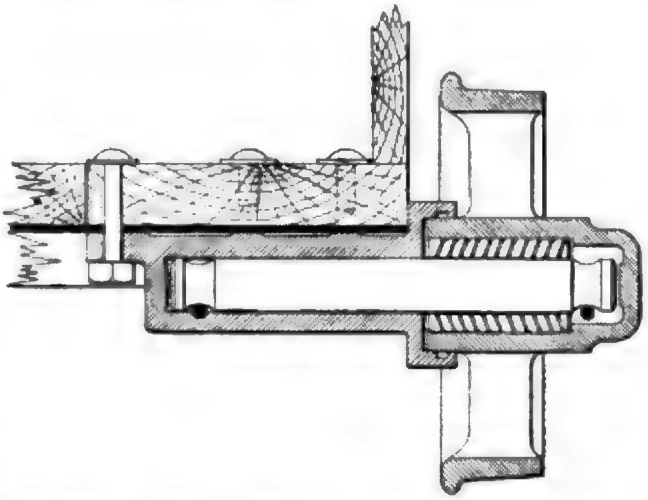
It is a fact that the axle, which must be changed in length for each track gage, is the most prominent obstacle to standardization. This drawback can be overcome by cutting the axle into two parts, lengthening the box and closing up the inner end. It is then necessary to make a bearing inside this box to take the thrust, which in the case of the full-length axle is taken care of at the opposite side of the car.

There are now four units to a truck instead of two, as in the case of full-length axles. By attaching two of these separate units to a steel channel and beveling these to fit its fillet, a single unit is made, equal in strength to any full-length axle. Any engineer can check the accuracy of this statement by applying the simple rules of "flexure in beams" to the axles under the two styles of loading.

This construction makes it possible to use the same units for any track gage, the difference being made up in the length of the channel, but with this exception all parts are interchangeable.

It seems that it would be desirable to go a step further and connect the two channels by a ¼-in. plate, bent at the ends or connected to the channels with angles and bearings to be changed at will and still always retain a fixed alignment of the four wheels. It will also permit the changing of these parts without disturbing the body of the car, as the truck can be bolted solidly to the bottom of the car.

Inasmuch as the bearing has an inclosed chamber, a type of wheel should be used that has an inclosed outer hub and also a bearing on the inside of this outer hub to do away with the wearing washers between the inner wheel hub and the box. The method of standardization



BY CUTTING AXLE IN TWO PARTS RUNNING GEAR CAN BE MADE TO SUIT ANY TRACK GAGE

A bearing is made inside the box to take the thrust which, where the axle crosses the car, is opposed by the wheel on the opposite side.

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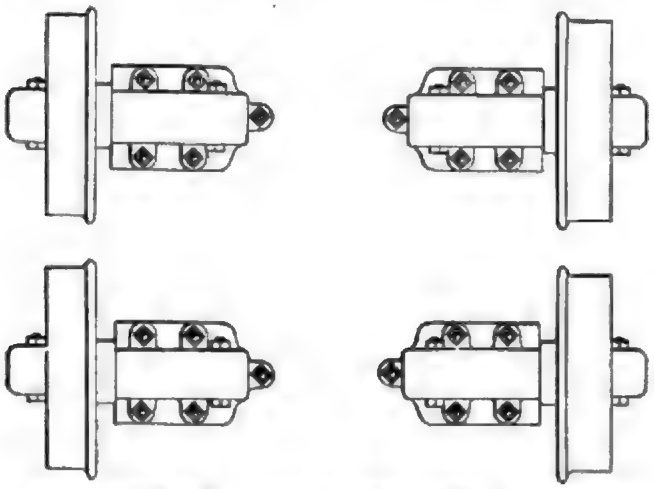
*Industrial engineer, Lewis-Hall Iron Works.

having been dealt with in general terms, it now seems appropriate to go into the details of construction.

The axle having been cut into two parts, some provision must be made to take up the thrust caused by irregularities and curves in the track. This can be done by providing a thrust bearing at each end of the axle, at the same time using a method of confining the wheel to the axle and the axle to the box which will permit a certain amount of end play. The inner end of the wheel hub also must be prevented from rubbing against the end of the box. Thus all the thrust is taken by the axle alone instead of a part being taken by the hub, and as the axle must necessarily be of less diameter than the hub the friction due to thrust is confined to a radius not greater than that of the axle, and its leverage is thereby reduced not less than 50 per cent.

As the axle is inclosed in a chamber composed of the box and the wheel hub, good workmanship assisted by the simple application of a felt washer will confine the lubricant to this chamber and eliminate the leakage, which is expensive, wasteful and dangerous.

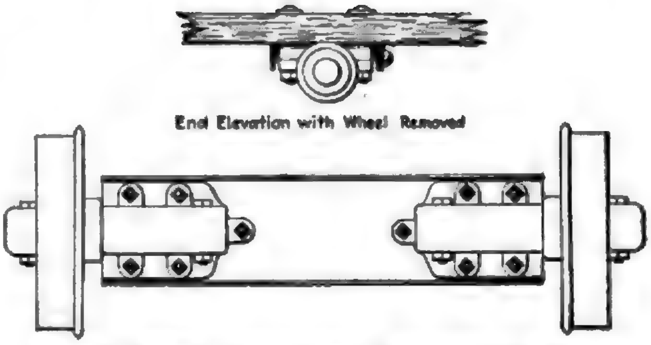


EACH WHEEL BO XCAN BE SEPARATELY REPLACED

With such equipment it is not necessary to keep a separate stock for every track gage which the mines may have.

It also seems to be a good time to propose a better method of applying lubricant to the wheels and axles. Many operators will admit that they use a cheap grade of black oil—not because it is the ideal lubricant but because they know a large percentage is going to drip out on the tracks and running gear, and to cover this loss, first cost of oil must be kept down. Why would it not be a greater economy to use the best, pay a higher price perhaps, and then put it where it is needed, keep it there, and make it work.

The old-fashioned pipe plug must go. It is continually getting lost or dropped into the dirt and then put back into place by a careless oiler, and the accumulation of dirt invited to enter the bearing and do its worst. Here is a good place to introduce another stage of standardization and one of several good systems of high-pressure lubrication, using a good grade of grease, presents itself as a desirable remedy for many difficulties which have been encountered in the past.



WHEEL BOXES ARE BOLTED TO STANDARD STEEL CHANNEL

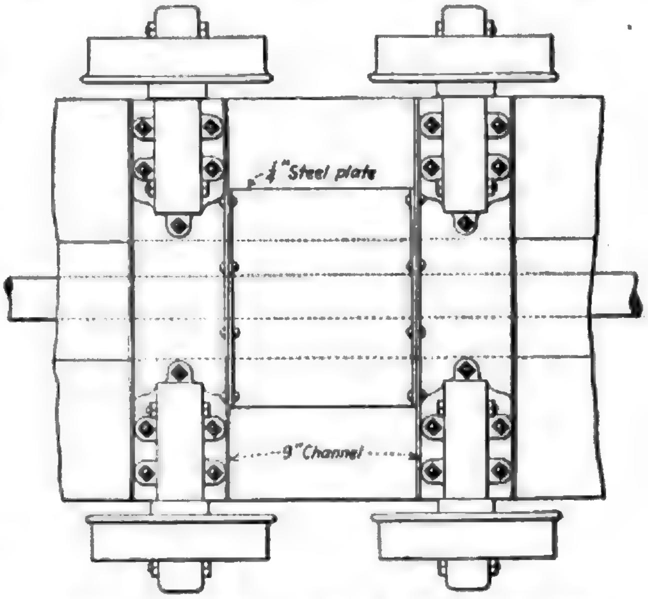
The length of this channel and its drilling is, of course, not standard, varying with every track gage.

Some operators prefer a roller-bearing wheel though others are satisfied with a plain "steel-on-iron" bearing. In order that all may be satisfied the wheel hub may be so made that to accommodate either style of bearing will necessitate only a slight change in the design of the hub, and the box can be kept the same for both styles of bearing, as the bearing surface proper is the inside surface of the wheel hub, the wheel turning on the axles.

Thus the bearing and the axle are interchangeable between the two entirely different styles of bearing—roller and plain—the lubricating system is the same for both and the one difference is in the hub of the wheel. What would this not mean to the stock of spare parts for mine-car running gears?

Now, in case a break occurs in wheel, axle or box, one-quarter of the car is out of commission and only one-quarter of the car needs to be torn down. A new unit is quickly installed and here again the value of the single unit is seen. With a full-length axle carrying two wheels and two bearings, a broken axle or a broken bearing requires a complete tearing down of one-half the running gear of the car, with the possible scrapping of this whole unit, whereas with the standardized single unit not more than one box, one wheel or one axle requires to be replaced. Here again is a great saving of time, labor and material, and the sum of these three items equals cost of repairs.

These points in favor of a standardized mine-car equipment may be briefly summed up under the follow-



STEEL CHANNELS UNITED BY WIDE CHANNEL

This channel may be made standard so long as the wheelbase is fixed. However, it is generally understood that the wheelbase should be one-third the car length. That length, however, is less variable than the capacity and can be standardized, for cars which violate this standard do not have to be thrown out.

ing list of features and advantages: (1) A running gear which is standard with all parts interchangeable regardless of track gage. (2) One that is adaptable to either plain or roller-bearing wheels. (3) One that will obtain the highest degree of efficiency and economy in operation. The side thrust incidental to travel around curves and track irregularities, which has heretofore been so destructive and troublesome, is entirely overcome by this construction. (4) Perfect and permanent alignment of the axles is obtained by attaching the four boxes to the rigidly built-up steel truck with bolts and lugs. (5) The side thrust is taken at the *ends* of the axle, inside the wheel and box, and for this reason there is no friction between the wheel hub and the box. (6) The wheel and box when assembled form a chamber within which the axle is wholly contained and inclosed, and further constitute a containing chamber for lubricant, so that the surfaces between which there is turning motion are always kept well lubricated. (7) The containing chamber is sealed; water, dirt and grit cannot get in nor can the lubricant get out. (8) The simplicity with which broken wheels, axles and bearings may be replaced will reduce running-gear repair costs to a minimum. (9) A modern system of applying lubricant will result in greater efficiency, greater economy and therefore better results.

In Regrouting Cylinder Foundation, Use Of Sulphur Was Narrowly Averted

By F. C. Sinback
Oak Grove, Ala.

Some time ago, while the master mechanic for a large coal-mining company, it became necessary for me to provide for the regrouting of the main generator engine—a 30 x 42-in. corliss. This machine was so constructed that the cylinder rested directly on the concrete foundation, a heavy flange being cast on the bottom edge, with holes cored through it to receive the anchor bolts. When the engine was erected the foundation was thoroughly grouted with cement, but at the time of which I speak, about two years later, the engine required releveling, and for this reason the foundation had to be regrouted.

As this occurred at a time when coal was in great demand and as our output would be cut about in half by shutting down this engine, much thought was expended on this problem, and a method sought for doing this work that would cause no delay in the operation of the mines.

The superintendent at this plant, himself an engineer, had decided on using sulphur for the grouting. This had the advantage over concrete in that it would solidify almost as soon as it was poured, whereas cement would require several days to harden. It was decided also to do the work on Sunday, so that no time would be lost in the operation of the mines.

I was afraid, however, that the heat from the cylinder would melt the sulphur, although I could not remember offhand the melting point of this material, nor did I know exactly how hot the bottom of the cylinder became. Something told me, however, that sulphur would not answer as grouting under that cylinder for the above reason.

I spoke to the superintendent about this matter, but he asserted that there was no danger. As I was unusually busy attending to other matters and as he had taken it on himself to handle this matter, I said no more at the time. The sulphur was purchased and all preparations made to do the work the following Sunday.

On the morning of that day I started raising the engine. All anchor bolts were loosened and the machine wedged up. I found that the cylinder had gone down about ½ in. into the grouting, but that the crank end of the girder frame remained practically in its original position. This is accounted for by the fact that the frame as designed was rather light, with the result that it was not stiff enough to prevent it from springing. This allowed the cylinder to work on the foundation to a greater extent than the rest of the machine. After wedging up and removing all the loose grout from under the cylinder a space of more than an inch in most places was left to be filled with the new grouting, and under the girder frame this opening gradually diminished until it became nothing at the extreme front end.

Melted Sulphur Readily on Exhaust Bonnet

The superintendent had been on hand for some time before I had completed wedging up and was looking after the melting of the sulphur. Having completed the preparation of the engine and everything being ready for grouting, I walked out to the point where the sulphur was being melted in a large iron pot and watched the proceedings for a few minutes. I was still not satisfied about the melting point of the new material as compared with the heat of the cylinder under which it was to be placed. Accordingly, saying nothing, I picked up a small lump of the sulphur, carried it into the power house and placed it on the exhaust bonnet of one of the other engines in operation at the time. It promptly melted. I at once realized that it would never do to use sulphur under the cylinder. I therefore returned and told the superintendent as much. To convince him, I picked up another lump of sulphur and asked him to come into the power house, where I demonstrated how it melted down on the exhaust bonnet of the running engine. After seeing this he became much agitated and asked me what we were to do. I told him to go ahead and pour the sulphur under the girder frame, while I gathered together enough lead and babbitt to grout the cylinder in place.

Lead, Babbitt and Zinc Used to Level Up

I collected about 1,200 lb. of lead, babbitt, zinc and all the other soft metal that was available. This we melted in the pot to which I have referred and poured it under the cylinder, using a large babbitt ladle for dipping it out. It took practically all the metal to fill the space, and we had several narrow escapes from being burned by flying metal, as this material blew readily when it came in contact with the damp concrete foundation. However, we operated the engine on Monday, and it has been running on this grouting ever since.

Had sulphur been used it would have melted out promptly on starting up, leaving the cylinder swinging on the girder frame. This no doubt would have broken, wrecking the engine and possibly causing loss of life. I have since looked up the melting point of sulphur and found it to be from between 239 and 248 deg. F. I have also found that the bottom part of the cylinder attained a temperature of about 266 deg. F. These temperatures tell their own story and show what might have happened if the foundation under the cylinder of this engine had been grouted with sulphur.

Make Wage Scales So Flexible That They Will Run for Years Without Injustice

By F. L. Baird*
Renton, Pa.

BUSINESS travels in cycles, with three major movements in each cycle. We have (1) the period of accumulation of capital with its easy money conditions, its gradually rising prices for capital and labor, its expanding credit and its general optimism; (2) the period of distribution with its overextension of credit and its overexpansion of business when prices of both commodities and labor reach their peak, when credit becomes strained and money scarce and high; (3) the period of depression when the public is pessimistic, industries shut down and labor is out of employment and when the public retrenches and stops buying.

In this last period frozen and overextended credits are gradually liquidated. Money becomes easy and cheap and seeks employment, and we drag along in this condition until the public comes slowly to believe that prices have reached their lowest point and begins to buy again. The length of the period of depression always depends on the speed at which commodities and labor are brought down to a normal level.

We then follow the cycle, beginning, as before, with the period of accumulation. This better economic condition starts in the section of the country that is first to adjust itself to the lower price basis. This has been the history of business conditions in the United States from the beginning and it is the natural outcome of the laws which govern the human mind.

Capital generally is in control of intelligent people, for if they were not intelligent they would not retain control of it long. During periods of depression capital is wise enough to renounce any attempt to continue making the big profits of the periods of great prosperity just past. Thus it is that capital always makes the sacrifices in profits before labor is ready to grant any concessions as to its rate of pay. In the language of the counting house, capital liquidates before labor.

Capital and labor must work hand in hand, for one is absolutely necessary to the other and on the success or failure of one depends the success or failure of the other. We cannot have prosperity of capital without prosperity of labor, and labor cannot be prosperous unless capital also prospers, for the producer is the ultimate consumer.

It is right and necessary that labor should have its organization to promote its welfare and have a hand in deciding its working conditions and remuneration. But the present system of inelastic wage rates covering a period of years that blindly overlooks the ever-changing economic situation due to the business cycle is wrong and fair neither to capital nor labor. So is a system that is set for each district without any regard to local conditions at the mines or without consideration of the restriction of the product to certain definite coal markets which the quality of the coal or the railroad connections and competition of other fields imposes.

I have said it is not fair to capital or to labor, and it is clear that it is harmful to the latter because during the periods of accumulation and distribution labor does not get its fair share of the profits that capital and labor working together create and therefore should enjoy in common and because during the third period, that of depression, organized labor resists wage reductions, so that, despite the willingness of capital to meet price reductions in non-union fields, it cannot do so, and the mine worker consequently gets little work, though at high wages, and there is a deadlock with the buying public, which retards the return of the accumulation period—a direct loss to labor as well as to capital. Furthermore, friction is inevitable in making a new scale, for what will not mend must end.

The unchanging wage scale is not fair to capital because during the period of depression the operator is forced to close his mines or run them at a loss.

The appended table will give an idea of a scale such as I have suggested. The selling price which is assumed to be normal for the 1918 wage scale is $2.40. All increases or decreases in price are taken as referring to this sales price. The wage concession is taken as 60 per cent of the price increase and the wage deduction 60 per cent of the price decrease. Thus the pick work price, which is 76c. with the price at $2.40, will be $1.063 when the price rises to $4, and 58.9c. if the price falls to $1.50.

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*Chief engineer, Union Collieries Co.

PROPOSED SLIDING SCALE FOR COAL-MINE WORKERS

			Mining, per Ton		Machine Mining Rates					Inside Day Wage				Outside Day Wage	
Average Selling Price, Run-of-Mine Coal, Per Ton	Percentage Relation of Sales to Basis Price	Percentage Relation of Wages to Basis Rate (60% Sales Percentage)	Pickwork	Machine	Cutters Wide and Narrow Work	Cutters Entry Per Yd.	Loaders, Wide and Narrow Work	Loaders, Single-Shaft Entry Work, Per Yd.	Loaders Double-shift Entry Work, Per Yd.	Shot Firers	Pumpers	Brattice Men	Common Labor	Tipple Hands	Common Labor
*$1.50	—37.5	—22.5	$0.589	$0.535	$0.0800	$0.1515	$0.4007	$0.3655	$0.4724	$[illegible].88	$3.72	$3.88	$3.72	$3.44	$3.20
1.60	—33.3	—20.0	.608	.552	.0826	.1564	.4136	.3773	.4876	4.00	3.84	4.00	3.84	3.55	3.30
1.70	—29.2	—17.5	.627	.569	.0851	.1613	.4265	.3890	.5028	4.13	3.96	4.13	3.96	3.66	3.40
1.80	—25.[illegible]	—15.[illegible]	.646	.582	.0877	.1662	.4394	.4008	.5181	4.25	4.[illegible]	4.25	4.08	3.77	3.50
1.90	—20.8	—12.5	.665	.604	.0903	.1711	.4523	.4126	.5334	4.[illegible]	4.20	4.38	4.20	3.88	3.60
2.00	—16.7	—10.0	.684	.621	.0929	.1760	.4652	.4244	.5486	4.50	4.32	4.50	4.32	3.99	3.70
2.10	—12.5	—07.5	.703	.638	.0955	.1809	.4781	.4362	.5639	4.63	4.[illegible]	4.63	4.44	4.10	3.80
2.20	— 8.3	—05.0	.722	.655	.0980	.1857	.4910	.4480	.5791	4.75	4.56	4.75	4.56	4.21	3.90
2.30	— 4.2	—02.5	.741	.672	.1006	.1906	.5039	.4598	.5943	4.88	4.68	4.88	4.68	4.[illegible]	4.00
†2.40	Basis		.760	.690	.1032	.1955	.5168	.4715	.6095	5.00	4.80	5.00	4.80	4.42	4.11
2.50	+ 4.2	+02.5	.779	.707	.1058	.2004	.5297	.4833	.6248	5.13	4.92	5.13	4.92	4.53	4.21
2.60	+ 8.3	+05.[illegible]	.798	.724	.1084	.2053	.5426	.4951	.6400	5.25	5.04	5.25	5.04	4.[illegible]	4.31
2.70	+12.5	+07.5	.817	.741	.1109	.2102	.5555	.5069	.6553	5.38	5.16	5.38	5.16	4.75	4.41
2.80	+16.7	+10.[illegible]	.836	.758	.1135	.2151	.5684	.5187	.6705	5.50	5.28	5.50	5.28	4.86	4.52
2.90	+20.8	+12.5	.855	.775	.1161	.2200	.5813	.5305	.6858	5.63	5.40	5.63	5.40	4.97	4.62
3.00	+25.[illegible]	+15.[illegible]	.874	.792	.1187	.2248	.5942	.5422	.7010	5.75	5.52	5.75	5.52	5.08	4.73
3.10	+29.2	+17.5	.893	.809	.1213	.2297	.6071	.5540	.7163	5.88	5.64	5.[illegible]	5.64	5.19	4.[illegible]
3.20	+33.3	+20.[illegible]	.912	.826	.1238	.2346	.6200	.5657	.7314	[illegible].00	5.76	6.00	5.76	5.[illegible]	4.[illegible]
3.30	+37.5	+22.5	.931	.844	.1264	.2395	.6329	.5775	.7467	[illegible].13	5.[illegible]	6.13	5.88	5.41	5.03
3.40	+41.7	+25.0	.950	.861	.1290	.2444	.6458	.5892	.7619	6.25	6.00	6.25	6.00	5.52	5.13
3.50	+45.8	+27.5	.969	.878	.1316	.2493	.6587	.6010	.7771	6.38	6.12	6.38	6.12	5.63	5.24
3.60	+50.[illegible]	+30.[illegible]	.988	.895	.1342	.2542	.6716	.6128	.7923	6.50	6.24	6.50	6.24	5.74	5.34
3.70	+54.1	+32.5	1.007	.912	.1368	.2591	.6845	.6246	.8076	6.63	6.36	6.63	6.36	5.85	5.45
3.80	+58.3	+35.0	1.026	.929	.1394	.2640	.6974	.6364	.8228	6.75	6.[illegible]	6.75	6.48	5.96	5.55
3.90	+62.4	+37.5	1.045	.946	.1420	.2689	.7103	.6482	.8381	6.88	6.60	6.88	6.60	6.07	5.65
4.00	+66.6	+40.0	1.063	.967	.1446	.2738	.7232	.6600	.8533	7.00	6.72	7.00	6.72	6.18	5.75

* Minimum scale rate. † All the wage rates to the right are those of the 1918 scale.

How to Socket Wire Rope and Retain Its Full Strength

Why Socketed Ends Fail—How to Make the Joint—Clean Wires with Gasoline, Hydrochloric Acid and Alkali—Use Pure Zinc Instead of Babbitt—All Instructions to Socketers Should Be in Writing

By Donald J. Baker
Charleston, W. Va.

How to socket wire rope most effectively is a problem that has never received the attention around the mine that its importance warrants. At shaft operations and plants having steep gravity planes the hoisting ropes are continually subjected to strains and stresses. Not only should they be frequently inspected but every effort should be made to develop a thoroughly systematized procedure for socketing them when new or for resocketing them when through daily wear and tear the socketed end has become no longer fit to withstand hard service.

Chief among the details to be borne in mind when placing an order for rope to be employed in a shaft or on a plane is that an adequate length should be provided. If only the requisite lineal footage is placed in operation, it will become necessary later to splice in additional short lengths to replace sections of several feet in length which have been cut off at the socket. Such rope soon becomes unsafe to use by reason of its diminished strength.

It is far better, and much more economical in the long run, to employ in the beginning a rope that is from 25 to 50 ft. longer than actual initial requirements. Yet it is not uncommon to see the drums of hoisting engines entirely bare when the rope is paid out.

Stresses sustained in heavy and continuous hoisting, while having their effects on all sections of the rope, are more noticeable in certain places than others. That portion of rope adjacent to the socket as well as that near or in contact with the shaft side of the sheave wheel when the cage is at rest at the bottom are subjected to more wear than is the rest of the cable. When the cage or skip comes to rest at the bottom of the shaft, the rope is continually vibrating. The extremity or point of this vibration ends at the sheave wheel and at the socket on the cage itself.

Cut Off Six Feet of Rope Every Six Months

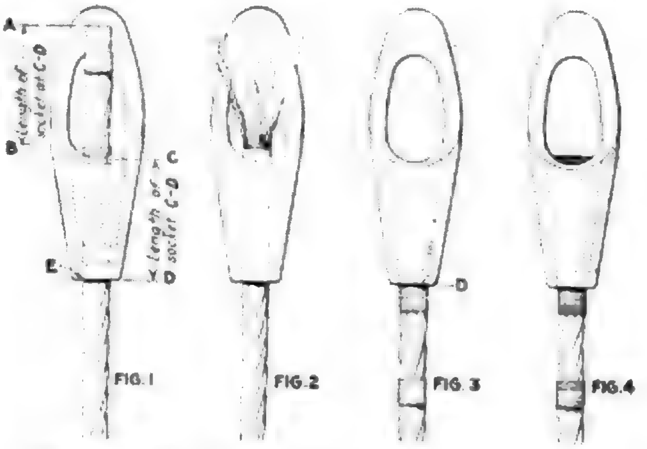
This is more wearing on the rope than the actual hoisting cycle. Not only is there a tendency on the part of the cable to stretch throughout its entire length at such times but shearing forces are exerted on the strands at the socket. It is considered wise, therefore, to cut off and scrap every six months or a year 6 ft. or so of the rope nearest to the socket. The section nearest the sheave wheel will then be lowered away from the point of undue stress, and consequently will not be subjected to any forces other than those exerted in a straight pull. It is always well to provide a drum that can carry the extra length of rope; otherwise in a few months it may be necessary to scrap the whole rope as too short for the service as a result of having become worn out at its lower extremity.

Heretofore it has been a fairly general practice in socketing rope around coal mines to pull a 6-in. length of the strands through the socket, bend them backward on the socket exterior, and then fill the interior with babbitt metal. The bent strands are then wired around the outside of the socket, and the job is considered as perfect as such a joint can be made.

In the first place, babbitt is not the most suitable metal for use as a filler; secondly, little care is exercised in the proper cleaning of the materials. These two factors alone in many instances give to the finished job a strength of only 50 per cent of the rope's capacity.

Recent experiments in the art of properly socketing wire rope do not tend to substantiate the claims made for older practices more generally in use. Infinitely more care should be exercised in cleaning the individual strands that are finally to rest within the socket. Then, too, unalloyed zinc is considered as being a far better socketing material than babbitt.

Two of the largest operators in the Pittsburgh district for several years past have followed a plan for socketing wire rope which it would be difficult to improve upon. The proper socketing of such rope is considered an operation of the utmost importance, for by it safety is promoted and valuable plant operation may be conserved at a time when it is most essential. The men in charge of socketing operations at too many plants are given merely verbal instructions as to how to proceed. This practice permits irregularities to creep into the work as a result of dimmed or hazy memories of the instructions actually received. The engineering departments of the companies referred to, however, have prepared tracings of what are now recognized as the four necessary steps in the operation. Furthermore, instructions (blueprinted from tracings) are issued covering the way in which each step of the work should follow its predecessor in natural sequence. Both blueprints are made on the same sheet, which is supplied to



FOUR STAGES IN THE SOCKETING OF WIRE ROPE

Three seizings are put on the rope. The socket is carefully cleansed of paint and grease and rounded out smoothly at E. The rope is then passed into the socket as indicated in Fig. 1. The end seizing is then removed; the wires are untwisted until they stand out like a broom, as in Fig. 2, and the hemp core is cut as far as the second seizing. The rope is then drawn back as in Fig. 3, and pure zinc at the proper temperature is poured in and the two remaining seizings are removed.

the men who have charge of the work. If the directions are followed to the letter—and there is small chance for deviation under the system adopted—there is only a remote possibility of the lives of men being jeopardized or of operations being tied up as a result of the rope pulling out of the socket.

The instructions here given are considered the most effective known today. Proceeding in accordance with them permits of the rope being used to a full 100 per cent of its capacity, instead of only 70 per cent, the figure that has long been accepted as safe where the strands are bent back on the socket and babbitt metal used as the filler.

Full directions for socketing wire rope as issued by one of the above-mentioned companies are as follows: Before cutting, the rope should be securely seized at the end with 1/16-in. black annealed wire tightly wrapped on in a single layer. Two additional seizings should be placed on the rope as indicated in Fig. 1 of the accompanying illustration. The second seizing should commence at a distance from the rope end equal to the length of the socket itself (as *CD*, Fig. 1), plus ¼ in., in order that the freed wires will finally project ¼ in. through the socket and to the outside.

The third seizing should be placed at approximately the same distance back of the second as the second is from the first. Care should be taken that these wrappings are absolutely tight and secure. It is extremely important that the main lay of the rope be prevented from untwisting, as otherwise the tension of the strands may not be equal to the strains upon them when the load is later applied. When all three seizings have been made, a hacksaw should be used for cutting the rope.

Grease, Paint and Sharp Edges Removed

Next, the internal surface of the socket should be thoroughly cleansed, and all paint and grease removed. The small-end opening of the socket should be smoothly rounded out at *E*, as shown in Fig. 1. This will remove any sharp or jagged edges that may have been formed in the casting or forging. The rope should be passed through the socket as indicated in Fig. 1.

Now remove the end seizing from the rope, permitting the other two wrappings to remain. Next untwist the wires in all the strands until they stand out, broom-shaped, as shown in Fig. 2. Cut out and remove the hemp core as far back as the first seizing now in place.

Dip the free wires into gasoline and then cleanse them thoroughly of all oil and grease. Follow this operation by dipping the wires into a solution of commercial muriatic (hydrochloric) acid. This latter dipping must remove all scale and expose the bright metal surface of each individual wire.

Next, dip the free wires into a solution of soda ash and hot water to thoroughly remove all traces of the acid. The strength of this solution should be that made by adding one ounce of soda ash to one quart of boiling water.

Pull the rope back into its proper position in the socket until point *B* of the rope (Fig. 1) comes opposite *D*, as shown in Fig. 3. Be certain that both the socket and the end of the rope are perfectly dry before either is brought into contact with the molten zinc. If one or the other is wet, steam will be formed, the zinc caused to fly, and severe burns may result.

Warm the exterior of the socket with a blow torch. See that the socket lines up with the axis of the rope, and then pour the socket full of molten zinc. The metal should be heated slowly in order that it may melt without burning. It must not be too hot or it may anneal the ends of the wires. From 700 to 800 deg. F. should be sufficient heat. To determine just when the metal has reached the most desirable temperature for pouring, the so-called "stick method" may be employed with safety.

A soft dry pine stick when dipped into the hot zinc and quickly withdrawn must not have any of the metal adhering to it; neither should it show signs of being much burned or charred. If the zinc adheres to the stick, it is too cold for pouring. If the stick appears a pale brown, then the metal is too hot to obtain the best results. The exact temperature of the zinc is reached when the stick shows no signs of zinc adhesion or of being burned.

Pour the molten metal slowly and evenly, allowing some of the zinc to flow entirely through the socket before plugging the bottom end. This insures the complete filling of the holder. If dross should form on the zinc in melting, be careful to let none enter the socket during the pouring process. After the zinc has fully solidified, carefully remove the remaining seizing wires. Great care should be exercised in doing this, that the wires of the hoisting rope be not cut or mutilated. Never use a hammer and chisel for cutting the binding wires.

The efficacy of the process here detailed depends on absolute cleanliness. The free wires must be perfectly clean in a chemical sense. After dipping in the various solutions, the wires must not under any circumstances be touched by the hands.

It has been found that the small amount of extra time consumed in socketing the rope in this manner, as against some of the older hit-and-miss methods, is of little importance. "Anything that is worth doing is worth doing well," and this old adage is quite as appropriate in socketing wire rope as in anything else. It will be found that by following this method the life of the rope is increased, little danger of an accident is incurred, and greater weights may be suspended from a given size of rope and socket. Certainly these are factors of the greatest significance.

Progress and Lost-Material Records Aid in Map Making and Inventory Keeping

ONE of the important duties of the engineering corps at a colliery is to keep the progress map of the mine up to date. Too often, however, this work is not done with the degree of promptitude and exactness it merits. In most cases the incompleteness is not the fault of men on the corps, for the data supplied to them are often vague and insufficient. Where the progress figures are collected by the members of the corps themselves in weekly visits to the mine accuracy is obtained, but the work is quite costly.

On the other hand, if the corps visits the mine at intervals of one or two months, the men are not familiar with the territory to be covered, and time is lost measuring up the progress made in places where the work performed does not warrant any such careful survey. Furthermore they find rooms have caved, in places only partly and in other places so as to be entirely inaccessible.

In the former case, though the place could be entered for purposes of inspection, it is really not safe to do so. So in places partly or wholly caved an approximation has to be made as to the length of the room at its termination. The pit boss in entering yardage in his notebook is interested in obtaining information which he alone requires, and he does not lay great stress on the progress map, believing that the engineering corps will, and should, take care of that. If appealed to for information covering a caved place of one or two months standing, he resorts to his notebook for yardage and relies upon memory for more detailed information.

A system of some kind, in which records are kept of progress and conditions underground, should be maintained at every mine. The practice often has been urged but seldom has been followed. No doubt the importance of these records as well as of others will be recognized more fully hereafter, for with their aid the task of the engineering corps will be simplified. Referring to the reports, the corps will have a clear insight as to what it has to do when it gets underground.

An excellent method of keeping records of the progress and conditions in the various places is used at the Jean mine of the Bertha Coal Co., Dinsmore, Pa. In taking his notes on yardage, R. M. Johnson, the mine boss, spends a little more time than is customary and enters descriptive notes of general conditions in each place. An example covering one portion of this mine is shown in record form in the table herewith. For this purpose an ordinary journal, 10 x 16 in., ruled horizontally, is used. These ledger entries are carried across a double page, allowing ample space for complete notes. As the rooms in this mine are driven in one direction only, a double page is all that is required for records of rooms driven from any one butt roadway. The notes are brought up to date after yardages are taken in the places and are entered in ink, longhand.

GUESSING HOW MUCH COAL HAS BEEN EXTRACTED

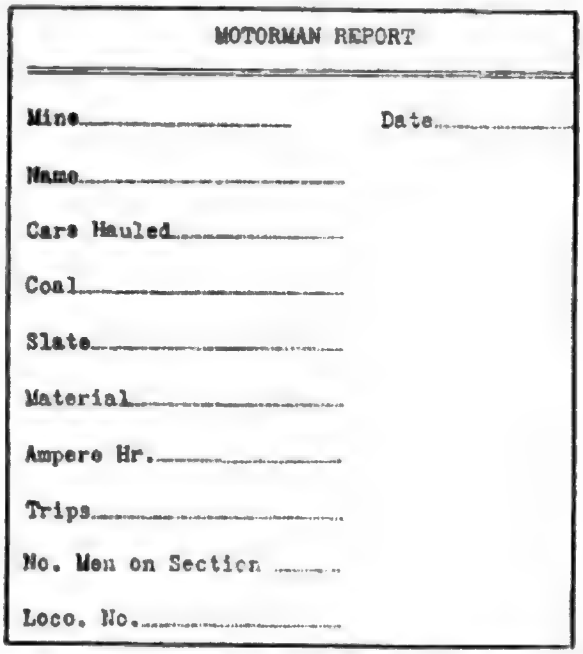
The record shown is almost self-explanatory, but the purposes of the different subdivisions ought to be discussed. Room No. 4 is a good representative of the kind of room which needs a record of this kind. After 30 ft. of pillar was out the roof caved and the rest of the coal was lost. The engineer, entering the neck and seeing the cave, would be at a loss to assume how much was taken out and how much left. However, the room was not driven up the standard distance of 230 ft., yet no reason was recorded for stopping it. Had this been added, the story would have been more complete.

The reason may be inferred from an entry under the heading "Remarks," where it is stated that the place stood idle for two months. Probably this accounts for the room not having been driven through, though it would be well to mention any such reason. The rooms are widened out on one side only, so that the track lies close to one rib. The last phrase under the heading "Remarks" develops certain facts. Evidently the roadway in the room has been posted along the entire length of the track. After standing for two months the roof showed signs of weakening. It was then decided to repost the trackway to insure clear passage for cars.

A so-called "half-and-half" system (half advance and half retreat) is followed in this mine, and therefore the pillar face in this room, which was being drawn on the "advance," could not progress beyond the break line. Dangerous falls along the length of the room necessitated its abandonment. Most of this story is substantiated under these headings. For plotting on a map, more information than "15 ft. rib lost" would be necessary. It might be anywhere along some 200 ft. of pillar and in one or two places.

In *Coal Age* issue of Nov. 25, 1921, an account is given dealing with the method of keeping records at an up-to-date mine in the Pittsburgh district, where reports are made out daily by the locomotive crews. At this same mine the cars are numbered and any work done on a particular car is charged against the car by number. At the Jean mine the locomotives are numbered and each motor has its own stall in the locomotive barn. Motor repairs are done outside, it being a drift mine. The locomotive crews are required to fill out daily reports on an itemized sheet as below.

The repairs on any one of the locomotives, including labor and parts, are charged up to it by number. Where more detailed reports are not deemed advisable, this form will serve a double purpose. From it one may arrive at the locomotive cost per ton of coal mined and also the man-power required per ton of coal during any one year.


MOTORMAN REPORT

Mine________________ Date__________

Name____________________

Cars Hauled______________

Coal____________________

Slate____________________

Material_________________

Ampere Hr.______________

Trips____________________

No. Men on Section ______

Loco. No.________________

Records of operations were unheard of a number of years ago. Yet by their means an appreciable cut may be made in the cost of operating, for they supply the necessary information for a comparative study of section with section, man with man, year with year, and finally determine the relative merits of different manufactured products.

RECORD OF PROGRESS AND MATERIALS IN SIXTH BUTT MAIN

Room	Face Advance in Feet	Rib Recovery in Feet	Remarks	Record of Materials
1	230	Rib all out	Clean; no coal lost	Material all out
2	230	Rib all out	Clean	Material all out
3	230	Rib all out	Clean	Material all out
4	200	30 ft. rib out; rest lost	*	Material all out
5	230	15 ft. rib lost; rest out	Due to caving	15 ft rail; 1 tie lost; other material out
6	230	Rib all out	Clean	Material all out
7	230	Rib all out	Clean	Material all out
8	230	15 ft. rib lost; rest out	Caved	Material all out
9	230	Rib all out	Clean	Material all out
10	230	20 ft. rib lost; rest out	Caved	30 ft. rail, 3 ties lost; other material out
11	230	Rib all out	Clean	Material all out
12	230	Rib all out	Clean	Material all out
13	230	No rib	Last room	Material all out

*Place caved in because of standing; stood 2 months before rib was started; reposted place all along roadway.

Ventilation as a Safety Factor in Mining*

By C. Lorimer Colburn†

AN OPERATOR has not done everything in his power to make his mine safe if he has neglected to install a positive system of ventilation, for it is not safe to depend on atmospheric conditions for supplying air to the mines.

As a rule, large mines with extensive workings are equipped with modern ventilation systems. Some of these systems are efficient, while others, on account of being poorly designed, do not distribute air to all the working faces. Many mines, especially the smaller ones, depend upon natural air currents for their ventilation.

The laws of some states require two exits from a mine. When two openings to the surface are provided a flow of air usually is set up. This current may be beneficial or detrimental, depending on atmospheric conditions. A change in the atmospheric pressure may start a draft in an opposite direction from that desired.

Is it best to leave such an important contributor to mine safety as ventilation to the uncertainty of weather conditions, or is it best to install a fan and always keep the movement of air through the property under control? Without trying to answer this question let us review a disaster that recently occurred at the Satanic mine, near Morrison, Col.

Fight Mine Fire in an Almost Vertical Seam

The Satanic is a small coal mine which has been opened by a vertical shaft about 200 ft. deep. The coal seam stands almost upright, dipping to the east at an angle of 85 deg. The shaft was sunk in the country rock and drifts were driven to the coal seam on the 100- and 200-foot levels. There are several openings to the surface where the coal seam has been worked out. A small fire started in this mine from spontaneous combustion; it originated in one of the worked-out portions of the mine. On Dec. 13, 1921, the superintendent, with several men, went underground to erect stoppings in order to seal the fire area and to isolate it from the rest of the mine. These men worked underground in the morning without discomfort.

In the afternoon the wind changed and there was at the same time an abnormal rise in temperature outdoors which changed the ventilation in the mine, driving the fumes from the fire area to the place where the men were at work. The fumes contained carbon monoxide, and all five men were overcome almost simultaneously. Two men from the surface went down to rescue these men. In the meantime the direction of wind had changed and the men who went underground passed the body of one man who had been overcome. One of the men was looking for his son, who was one of the five that had succumbed. While they were underground the direction of the air current changed again. The father was overcome and lost his life and the second man barely managed to make his escape.

The superintendent, four of his miners, and the father of one of them, lost their lives in this disaster. If this mine had been provided with fans and if the ventilation had been under control, this disaster would not have occurred. Many of the small mines throughout the country are hazardous on account of lack of controlled ventilation. Many of these mines have been working for years without inconvenience. Does the disaster at the Satanic teach us a lesson that all mines, whether large or small, coal or metal, should have positive ventilation, or is this just an exceptional case?

Centrifugal-Pump Primer Handles Only Air And Not Water, Thus Saving Power

MOST mining men have had their experiences—and frequently they have been none too pleasant—with air-bound centrifugal pumps. These machines must be filled with water in order to operate, and consequently in most cases some means must be provided for priming. The exact shape that such means will take depends, of course, upon circumstances and local conditions. In many instances a priming pump of some sort is essential. To meet the need for a machine for this purpose the pump shown in Fig. 1 has been placed on the market by Barrett, Haentjens & Co., of Hazleton, Pa. It has no inlet valves. Air enters through openings in the sleeves (1). The piston (2) overruns the openings and discharges the air to the open through the leather-faced valves (3). Both of these valves slide over the piston rod, their motion being controlled by the spring (4). The driving mechanism is enclosed, but ready access may be gained by removal of the cover (5). Drive is made through a short belt from a motor mounted on the bedplate.

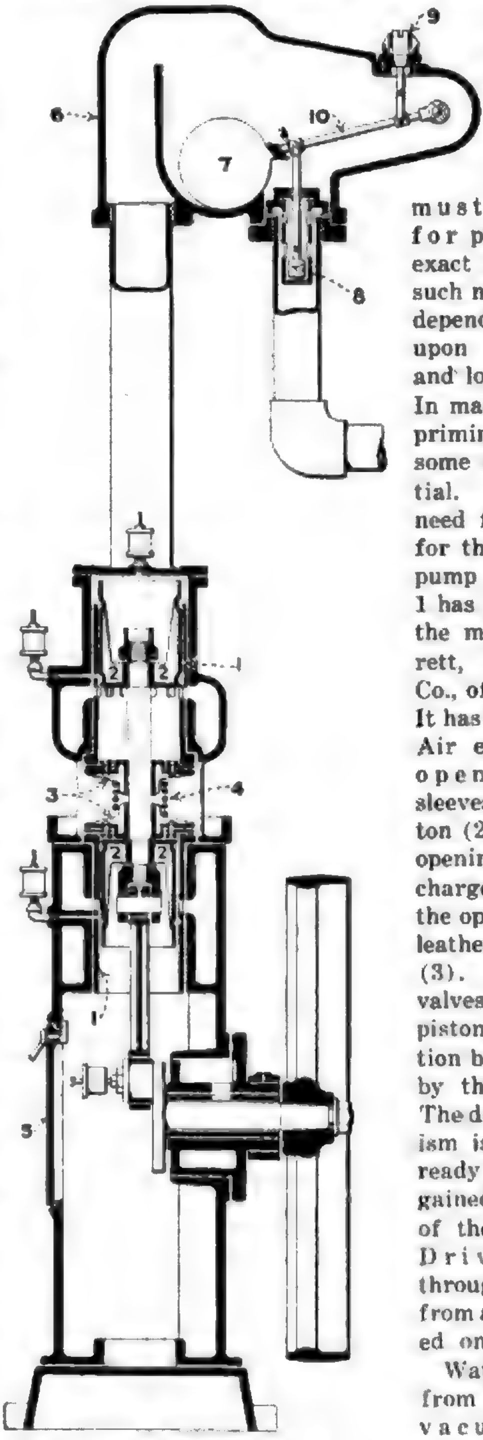


FIG. 1. CROSS-SECTION OF PUMP PRIMER

The priming pump is shown in the lower part of the illustration and the vacuum breaker is to be seen in the upper part.

Water is prevented from entering the vacuum pump by means of a vacuum breaker installed about two feet above the top of the cen-

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*Excerpt from *National Safety News*.

†Mining engineer, U. S. Bureau of Mines, and safety engineer, National Safety Council.

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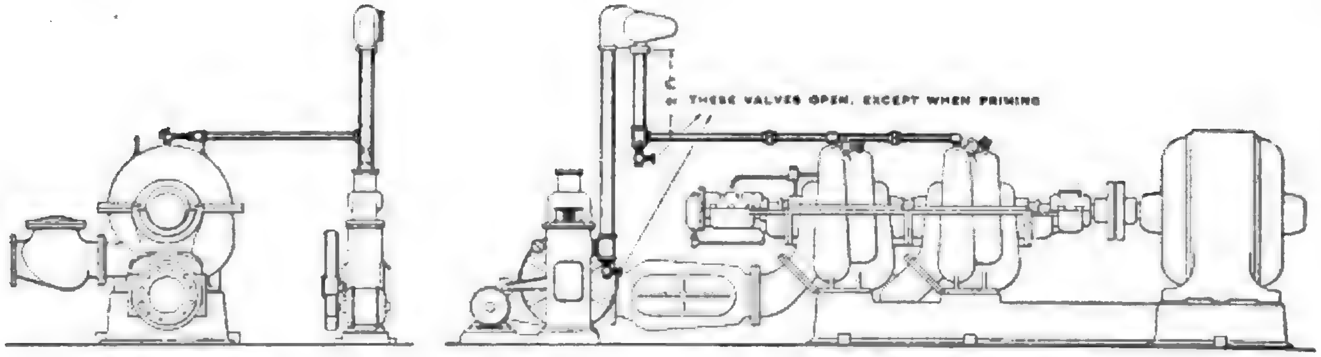


SIDE—ELEVATION

FRONT—ELEVATION

FIG. 2. FRONT AND SIDE ELEVATIONS OF MOTOR-DRIVEN CENTRIFUGAL PUMP FITTED WITH PRIMER

Several centrifugal pumps can be served by a single priming device but the priming pumps must be so arranged that they can be readily drained, lest the water they contain be drawn into the housing and cause the float to rise and open the air valve before the pumps are primed.

trifugal pump. The priming pump thus handles air only and as a result consumes but little power. In operation, after the drain valves on the main pump are closed and the priming valves opened, the vacuum pump is started. This draws water through the suction pipe and pump casing and finally into the vacuum housing (6)—see accompanying cross-section. Here the float (7) begins to rise, carrying with it the check valve (8) and the air valve (9), both of which are attached to the float lever (10). Air accordingly enters the housing through the valve (9), reducing the vacuum and allowing the water to fall again. After a few fluctuations both water level and float remain steady, the quantity of air entering the housing being equal to the quantity handled by the pump and the vacuum maintained being equal to the difference in elevations of the water in the sump and in the vacuum breaker. The centrifugal pump is now primed and remains in this condition as long as the priming pump continues to run.

When now the main pump is started and pressure builds up within it water flows over to the vacuum breaker, causing the float to ascend until valve (8) comes against its seat, checking this flow. Several centrifugal pumps may be served by one of these priming devices, but the priming pumps must be so arranged that they can be completely drained. If this is not done the water contained may be drawn into the housing, causing the float to rise and open the air valve before the pumps are primed.

In general a priming or globe valve should be attached to the highest point of each stage of each pump. This statement is not strictly true, as certain types of pumps require priming of only one stage. The priming valves should be attached to the vacuum breaker as shown in the drawing.

Broken Mine Timber Saved by Resawing

DURING 1921 the Philadelphia & Reading Coal & Iron Co. saved 2,500,000 ft. of timber by sawing into lumber, etc., old mine props no longer safe or suitable for mine support, due to breakage and decay. By salvaging this material the drain on the nation's timber resources was lessened by just the amount sawed and put to use again.

Years ago this material was burned at each colliery as so much waste, thus losing not only the material consumed but the labor of burning it. Today all but the much decayed and damaged props are saved for sawing into plank and wedges, and the remainder, partly suitable for fuel wood, is burned at the colliery incinerators. Even this would not be burned were a market at hand for firewood. Due to the proximity of the coal mines no one seems to want to burn old mine timbers for fuel purposes.

The company now has 22 old mine-timber sawmills in operation without which it would be necessary to purchase in the yellow-pine region of the South 2,500,000 ft. of mine plank, in addition to the amount now necessary to purchase. Gradually as the forests of the South are cut over and depleted, the savings effected at these mills will become more pronounced. As it is believed that the exportable supply of Southern timbers will be gone in 15 years, old mine-timber sawmills serve to lengthen that supply to Northern consumers by the amount saved in that period, or 37,500,000 ft. by this company. Other anthracite companies having similar mills are effecting like economies.

Eye Accidents Exceed Expectation

BEFORE compensation was paid, eye accidents were not thought sufficiently numerous to need serious consideration. It is now known that the losses of arms or of hands or of legs or of feet separately involve less aggregate compensation than loss of eyes. Unfortunately protecting the eye is less easy than might be thought. Goggles must be strong so as not to constitute in themselves an added hazard, and they, consequently, are not as easy to wear as spectacles or automobilists' goggles. The workman who wears them in the mines must exert himself, like all mine workers, and the perspiration of the worker makes the use of goggles annoying and is apt to cause soreness of the parts in contact with them.

Death cases, of course, lead all others, but eye injuries have to be compensated by sums of money—much smaller, it is true, but still comparable in importance with injuries resulting in death. Thus in ten bituminous coal counties—Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Mercer, Washington and Westmoreland—the compensation awarded to Jan. 1, 1922, from the time the Workmen's Compensation Act of Pennsylvania became effective Jan. 1, 1916, has been:

Death cases	$9,818,441
Loss of eyes	1,313,582
Loss of arms	234,777
Loss of hands	707,887
Loss of feet	373,467
Loss of legs	332,976
Permanent total disability	159,886
Ordinary disability	3,977,086
Total	$16,918,102

Bureau of Mines Reports and Investigations

An Investigation Regarding the heat of distillation of coal is being conducted at the Pittsburgh (Pa.) experiment station of the Bureau of Mines. This investigation has for its object the determination of the amount of heat evolved or absorbed through chemical reaction during the process of destructive distillation of coal. Such information will be of value to the byproduct coking and gas industries in that it will give them a more accurate knowledge of the thermal requirements of their ovens and retorts. The problem is being attacked by distilling small amounts of coal in a bomb calorimeter, the necessary energy being supplied electrically and being accurately measured by electrical means. The heat effect of the standardized amount of electrical energy required to distill the coal is measured in the calorimeter and compared with the effect of the same amount of energy supplied to the products of distillation in the calorimeter during a parallel experiment. The difference between the two effects gives the reaction heat of the coal, positive or negative, as the case may be.

Work on the Development of new types of coal-sampling apparatus is being done at the Washington (D. C.) office of the Bureau of Mines, under the direction of O. P. Hood, chief mechanical engineer. The practicability of coal inspection on a large scale depends upon the development of sampling devices which can obtain a true representative sample with the least possible interference with transportation methods. This means the development of apparatus somewhat comparable with apparatus used for loading and unloading coal. A machine has been developed which will drill a 6-in. hole vertically through coal carried in a car and abstract the cuttings. Complete detailed plans have been made for a single sampler adapted to take samples from truck loads at the Government Fuel Yard. General plans also have been developed for a multiple sampler adapted to take samples from open-top cars in a railroad train without distributing the train or unloading the coal. Only the reduced laboratory sample is to be taken from the sampler.

Investigation by the U. S. Bureau of Mines of gas masks for use of train crews in railroad tunnels has been completed. Results of the tests will soon be published by the bureau in a technical paper entitled "Tests of Gas Masks and Respirators for Protection from Locomotive Smoke in Railroad Tunnels, with Analyses of Tunnel Atmospheres," by A. C. Fieldner, S. H. Katz and S. P. Kinney. A small mask was devised that fits conveniently into a coat pocket, and in actual service with locomotive engineers and firemen was found to last two to six months before distasteful gas penetrated.

To Determine the Nature and Quantity of poisonous gases produced when fires in a mine, in a closely confined space, were extinguished with carbon tetrachloride and with foamite fire extinguishers experiments were made by the Bureau of Mines at the request of the West Virginia Department of Mines. Carbon tetrachloride developed the poisonous gases phosgene and hydrogen chloride in dangerous concentrations. No dangerous gases other than those coming from the fire itself were found with the foamite.

At the Pittsburgh Experiment Station of the U. S. Bureau of Mines in connection with the investigation of coal-storage problems, coal has been exposed to excess air for three hours at 150 deg. The amount of oxidation products formed and the amount of oxygen absorbed are taken as a measure of the tendency of the coal to ignite spontaneously. The method has been tested on Newfield (Freeport) coal and Texas lignite with fairly consistent results.

Pacific Coast Coal Co. Excludes Union Men And Forms Its Own Bargaining Council

At the time the Pacific Coast Coal Co. severed relations with the United Mine Workers of America, and several times since, it announced that as soon as its working forces approached normal it would adopt a principle of collective bargaining, giving its employees a voice in the discussion of their industrial relationships. On Jan. 25 of this year the Pacific Coast Coal Co., after extensive investigation, presented its "plan of collective bargaining through which not only the fundamentals of employment such as wages, hours and working conditions, but the details of practically all matters in connection with employment and living conditions" will be "determined through mutual agreements between appointed representatives of the management and elected representatives of the men."

In their constitution it is expressly provided that "membership in, or any activity in behalf of, the United Mine Workers of America, or membership in, or activity for, any other mine-labor organization will be a bar to employment." In explanation of this clause the company says that the union "by its actions with respect to the coal-mining industry in the State of Washington has demonstrated that the policy of its leaders is not that of collective bargaining but rather of dictation and that its purpose is to force compliance with its policies in total disregard of the welfare of both employers and employees, even to the point of forcing financial ruin upon the business of the employers and hardship, privation and even suffering upon its own members."

It also is provided that while alien employees are to receive the protection and privileges of the joint organization, they shall not be allowed to vote or hold office in the organization unless they have declared intention to become citizens.

Under the plan mine councils are formed at each of the mines—Black Diamond, Newcastle, Franklin, Burnett and Issaquah. These will consist of elected representatives of the employees and appointed representatives of the management. There will be twice as many of the first as of the second, but, as the management representatives, at least

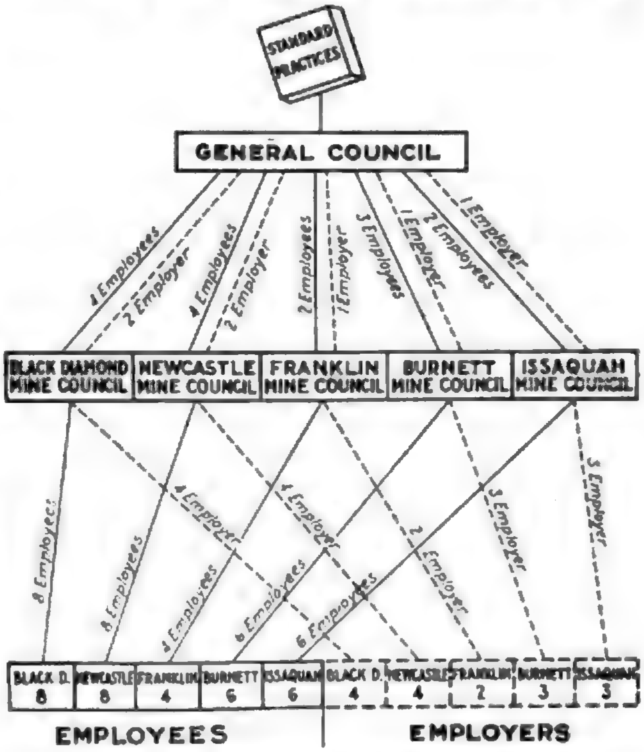


FIG. 1. CHART SHOWING COMPOSITION OF COUNCILS

Employees and employers meet in separate mine councils and these in turn are represented in a general council, the operations of all being regulated by the established standard practices, which, however, may be changed by appropriate action.

in a full house, will have two votes each, a balance will be struck between the delegates of the men and the company. The votes will in every case be by written secret ballot.

As will be seen in Fig. 1, the mines will not be equally represented but will be accorded a council having members proportionate to the number of men employed. Not more than one representative is to be elected for each one hundred employees, but no mine is to have less than two employee representatives.

The men at each mine will not vote for representatives collectively but they will be divided up into groups, somewhat strangely termed "zones." Just what these zones are may be best comprehended by detailing those formed at the Black Diamond mine. Zone A consists of miners on the Little Seam; Zone B, miners on the Big Seam on the eighth and ninth levels; Zone C, miners on the Big Seam on the tenth and eleventh levels; Zone D, inside haulage men; Zone E, inside timber men; Zone F, all other inside men; Zone G, outside mechanical men, and Zone H, all other outside men. Each of the eight zones has one representative.

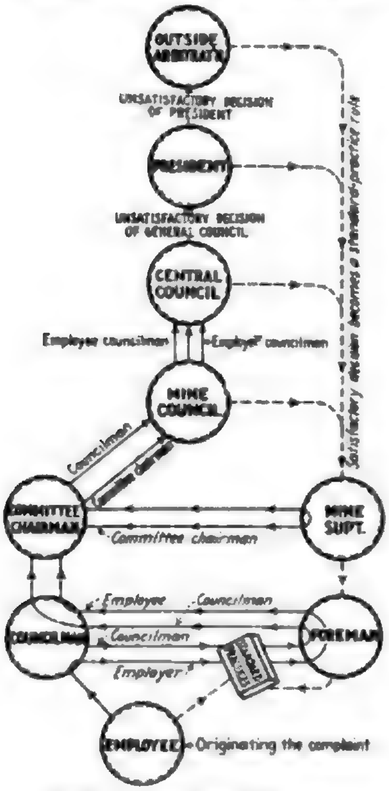


FIG. 2. TRAVELS OF A GRIEVANCE

The president has the right to veto decisions on grievances made by either mine or central council, but, if all the employee representatives in the latter council so desire, the matter must go to an outside arbitration board.

A central council meets at Seattle once a month. It would be a large and expensive body if all the thirty-two employee representatives and all the sixteen company representatives were to be members of this central council. Consequently it is arranged that there shall be only fourteen employee members and six management members, each employee member shall be entitled to one vote and the management representatives, as in the mine councils, to an equal total number of votes equally distributed among them, all votes to be cast separately and all by secret ballot.

The members of this central council will be elected by the mine councils. At meetings of the council the management may be represented by the manager of the mines, the vice-president and the president when they are required or desired to attend. Whether they are entitled to a vote is not stated.

This central council shall be delegated full authority and responsibility in all matters having to do with employment relations, including wages, hours, working rules, working conditions, safety, sanitation, housing, merchandise, store and hotel service, hospitals' and physicians' services, recreations and such other matters as the representatives of both sides come to feel have a relation to their work and their effectiveness as members of the plant.

The mine councils are obliged to leave to the central council such matters as basic wage scales, hours or general working conditions or other matters of such breadth of scope as to be of general and equal importance to all the employees of all the mines operated by the company.

All the expense of the monthly meetings of mine councils and the central council will be paid by the company. Those attending the central council meetings will receive actual transportation expense and $10 per day to cover the cost of their room, meals and wages lost. If the management calls special meetings the company will foot the bill, but if the employee representatives call them the employee councilmen will pay all their own expenses. A quorum consists of two-thirds of each class of representatives.

The employee mine councilmen serve for one year only and cannot be elected for two consecutive years. When they are elected to fill vacancies in unexpired positions due to recall, resignation or other causes they must retire at the end of the time for which their predecessor was elected, with no hope of re-election for a period of twelve months. Representatives absenting themselves from council three times without satisfactory excuse to the committee chairman will be held to have resigned. An employee councilman may be recalled by a secret ballot of the men in his voting zone if the ballot shows that two-thirds of the voters desire his recall.

How Grievances Are Filed and Handled

The administration has full power to select, hire, assign and promote employees. When men are discharged or quit they may file a grievance, but not after they have drawn their pay unless they obtain permission from their superviser. Grievances between a mine employee and his superviser are taken to the mine committee chairman, who takes the matter up with the superviser next in authority over the superviser mentioned or with the mine superintendent.

If this company official's decision is unsatisfactory to the committee chairman or to the complainant it goes to the mine council at its next regular session. In case of a deadlock it goes to the central committee. If deadlocked there it may go to the president of the company.

If the president does not like any decision of either mine or central council he can veto it. If, however, all the employee representatives in the central council do not like his decision or disapprove of his veto then it may be appealed to outside arbitration, the employee representatives selecting one arbitrator, the management representatives one and these two a third.

If an agreement as to the arbitrator be not reached within seven days either side may ask the Judge of the U. S. District Court, Western district of Washington, Northern division, to name the third arbitrator, who shall be accepted immediately by both sides. The decision of a majority of the board shall be final, and the decision shall form part of the standard pratices of the company. A mutual-service director has been appointed to act in an advisory capacity. He has no vote in the councils but he may speak when they meet and discuss matters informally with the employees and the management.

While admitting the seriousness of the pollution of streams by coal mines of Pennsylvania, officials of the U. S. Bureau of Fisheries in a discussion of the pollution question before the House Appropriations Committee opposed drastic legislation which might injure the mining industry. It was said that some waters could absorb more acids than others and that while some pollution might be injurious to fish it might not be injurious to public health. It was said that the situation at Pittsburgh was complicated by wastes from abandoned mines and that further investigation was needed, it being a difficult situation to handle. Officials of the Fisheries Bureau said the country would not approve any attempted anti-pollution legislation which would interfere seriously with the operation of coal mines in western Pennsylvania.

Seventy-two per cent of the mines and 91 per cent of the annual output of Illinois coal mines is handled by mechanical haulage, mostly electric locomotives, of which there are 1,424 in use at present in Illinois. Sixty-one and one-half per cent of the total annual output also is undercut by electric mining machines, of which there are at present 2,750 operating in the mines of the state.

Problems of Operating Men

Edited by
James T. Beard

Working Coal on Steep Pitches

Slope Driven on Full Dip—Room and Pillar System Used on the 400-Ft. Level—Longwall Advancing, on the 600-Ft. Level—Gangway Driven in Soft Sandstone and Crosscut to Air-course in the Coal

HAVING had an extensive experience, both as a miner and having charge of mines as superintendant and mine manager, working coal where the pitch of the seam ranged from 30 deg. to vertical, I read with deep interest the article of George Watkin Evans, *Coal Age*, Jan. 26, p. 157.

My experience has covered a period of thirty years and was gained in the highly pitching seams of the Pennsylvania anthracite region and in the states of Washington, California and New Mexico, as well as the provinces of British Columbia and Alberta, in Canada.

First, let me say that the idea of driving the main entries and air-courses in the footwall or hanging wall of the seam and working out the coal on a stepped longwall system is not new, it having been employed for many years in coal mines, both in this country and elsewhere.

EXPERIENCE ON STEEP PITCHES IN CALIFORNIA MINES

During the year 1900, I was in charge, as general inside mine foreman, of a mine at Tesla, Cal. The dip of the seam varied from 50 to 65 deg. The mine was opened by a slope driven on the full dip of the seam. A double-deck cage was used for hoisting and this operated on a track having a wider gage than the mine cars.

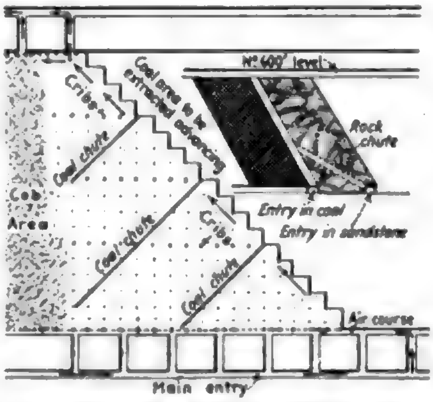
The cars were inclosed in the cage and could not get away while being hoisted. At the surface, the cars were pushed off automatically. The entire equipment was a safe means of handling coal in steeply pitching seams and there were few delays from wrecks occurring in the slope.

From the 400-ft. level to the outcrop of the seam, the coal was worked by the room-and-pillar system, combined with chutes and pillars, both the rooms and the chutes being driven up on the full pitch of the seam. Another system sometimes employed was to drive the chutes and rooms across the pitch, at a suitable angle to run the coal to the entry below.

The angle system is very good where the coal is reasonably hard, so that the hanging rib will not fall away and cause the roof to cave, which would mean much expense and labor in timbering. I used that system with great success at the Wilkeson Coal & Coke Co.'s mine, at Wilkeson, Wash., where I was employed.

In the No. 3 mine at that place, the coal pitched at an angle of 75 to 80 deg. The accompanying figure shows the stepped longwall advancing system installed on the 600-ft. level, in that mine. I believe this is practically the same method of mining described by Mr. Evans, in the article to which I have referred, the only difference being the system at Tesla was longwall advancing, while that described by Mr. Evans was on the retreating plan.

The system is described briefly as follows: From the main entries, chutes were driven up in the coal on 40-ft. centers and partitioned off to provide a good manway on one side. A counter airway, or air-course, was also driven in the seam, about 40 ft. above the main entry.



CROSS-SECTION AND DETAIL IN STEEP SEAM

Starting from the air-course, the coal was worked out on the longwall-advancing, stepped system, as shown in the figure. The places were double-shifted. The coal was of such a nature as to require no blasting, mining readily with the pick. At times, it was necessary to post and lag the face to prevent the coal from running freely.

Cribs or cogs were built in rows, 40 ft. apart on the pitch and 10 ft. apart on the strike of the seam. A series of sheet-iron chutes were carried up between these cribs, for the purpose of conducting the coal down to the chutes leading to the main entry, where it was loaded into the cars.

The chutes served two purposes; they allowed the coal to run slowly down to the entry, thus reducing the breakage of the coal; and they also afforded an opportunity for the Japs to pick out the refuse and other impurities as the coal descends to the entry.

GANGWAY DRIVEN IN THE SANDSTONE

Owing to the heaving nature of the footwall, it was found expensive to maintain the haulage road in good condition for hauling the coal. As has been suggested by Mr. Evans, this difficulty was overcome by driving another gangway in the soft sandstone hanging wall, parallel to the old gangway driven in the coal. These two gangways were driven on 40-ft. centers and, at intervals of 400 or 500 ft., were connected by crosscuts.

As each new crosscut was driven, that section of entry, in the coal, was robbed and abandoned, saving all the timbers possible and using them again. The entry driven in the sandstone required very little timbering. Also, the stone was so soft that augers were used for drilling the holes and the cost of driving was much reduced.

In the later development of the work chutes were driven on an angle of 30 deg., from the sandstone gangway through to the seam where the counter entry, or air-course, was carried. This change proved a great saving in expense and was very successful.

J. W. POWELL.
Raleigh Wyoming Coal Co.
Edwight, W. Va.

Seal Off or Ventilate, Which?

Does removing or confining an existing danger afford the greater degree of safety—Purpose of sealing off—Effect in the mine—Reasons why sealing off may not prove effective.

MENTION has been made in *Coal Age*, not long since, of the discussions that took place at a meeting of the Coal Mining Institute of America, last December, regarding the relative safety of sealing off abandoned places in mines, or attempting to ventilate them.

The subject was presented by E. S. Moore, and the discussion that followed seemed to revolve around the question as to whether a greater degree of safety could be affected by sealing off places that had been worked out and abandoned, or ventilating them.

To my mind, the situation is fairly expressed by the general statement that a greater degree of safety is provided by the removal of an existing danger, or adopting means for its prevention; rather than by attempting to confine such danger within limits.

First, it will be generally admitted that a ventilating current properly conducted can be made very effective in the removal of accumulations of gas from particular sections of the mine, unless extensive falls of roof form an impassable barrier to the passage of the air current.

Drillholes Sunk from the Surface to Remove Gas

This condition will frequently occur and must be anticipated in considering the question of removing gas, from worked-out sections of a mine, through the process of ventilation. When that happens recourse must be had to drilling holes from the surface, in order to remove the gas. One of the objects of sealing off abandoned places is to avoid this expense, particularly in deep mines.

The most that can be expected to be accomplished through the ventilation of void places in a mine, is the removal of the gases accumulated therein and the reduction of the temperature of the air in the place. This cooling has but a slight effect to decrease the liability to spontaneous combustion in the mass of fallen material mixed with fine coal and slack, which is the general condition following the drawing of pillars in the abandonment of a place.

As is well known, the conditions following the drawing back of pillars, in a mine, are ideal for the creation of gob fires, and the production of dangerous gases, thereby. In view of these conditions, ventilation can hardly be said to be sufficiently effective in producing the greatest degree of safety in every case.

When Sealing Off Is Not Effective

With regard to sealing off places that are abandoned, the work to be effective must be done in such a manner as to make it impossible, under any conditions, either for the mine air to penetrate the inclosed space, or for the imprisoned gases to escape into the live workings.

Following are a few of the reasons why sealing off may not be effective: 1. The sealed area will be filled with atmospheric air, under the temperature and pressure of the mine, when the seals are first built. In time, the temperature within the inclosure gradually rises, tending to a more rapid generation of gases behind the seals. At the same time, there is an increased pressure within, which tends to drive out the accumulated gases, through any cracks or crevices that may exist in the seals or in the strata.

2. The seals erected are necessarily close to the caved portion and, unless there is a sufficient coal pillar surrounding the place, it will be difficult to make the seals air-tight. Owing to the broken condition of the strata overlying large abandoned areas, there are prone to be cracks and crevices through which the gases within can escape into the live workings.

3. Allowing that the stoppings are well built, making the place practically air-tight on completion of the work, there is no guarantee that it will continue to be so under the increased pressure of the overburden due to the extension of the workings.

4. In the lapse of time, there is no doubt that the oxygen content of the inclosed air will be reduced greatly. The resulting mixture of gases, though not explosive, quickly become explosive on the admission of fresh air to the place. A heavy fall of roof occurring within, the area would project this dangerous accumulation of gas into the mine air in the workings.

Avoid Conditions That Make Waste Places Dangerous

Personally, I am not an advocate of sealing off abandoned areas in a mine. It is dangerous to imprison any destructive force in a mine. By so doing, we establish intimate relations with a known and active enemy. There is no more elusive force or more difficult condition to control than that arising from the presence of gas in a mine.

It is, of course, wrong to criticise a plan severely without suggesting a remedy. In the present instance, improvement may be effected by reducing, as far as possible, all conditions that make waste places in a mine dangerous. Avoid leaving coal stumps when drawing back the pillars. Draw all timber and induce a fall of roof, so as to maintain as small a standing area as possible. It is true there must be some waste coal that cannot be recovered in the work of robbing.

The throwing of fine coal or slack into the gob when driving a place, however, can be prevented. All solid working places should be thoroughly cleaned of waste coal, which should be loaded out of the mine. Uniform pillars of sufficient size to prevent undue crushing should always be maintained in the first working, which will go a long way to avoid trouble in drawing back the pillars. I. C. Parfitt.

Maple Ridge, Pa.

ANOTHER LETTER

Kindly permit me to express my views on the question of sealing off abandoned workings of a mine, which was recently discussed by members of the Coal Mining Institute of America, as reported in *Coal Age*, Nov. 3, p. 734.

This is a question on which I have expended much thought. My experience in handling such a situation, in the mine, compels me to say that I would not seal off any section or abandoned area. It is no theory of mine, but based on actual facts in my own experience.

Gas Accumulates in Sealed Area

There comes to my mind, now an instance that I will mention briefly. The main headings, in our mine, had been driven approximately three miles. As is commonly the case, the coal had been worked out from a considerable section lying between the shaft and the present live workings. In this case, the main intake and main return airways paralleled the main haulage road, which was also a return airway.

The arrangement was such that it was thought impracticable to force the return air through the old workings; and, as a result, these old works had become filled with blackdamp. To prevent these gases from contaminating the mine air, it was deemed best to seal off the old abandoned works and that had been done.

On a certain occasion, later, it became necessary to shut down the fan for extensive repairs. The result was that the gas flowed out from the old workings, through every crack and crevice, and the live workings were practically filled with these gases. So bad was the condition that, for a long time afterwards, the men were unable to work in their places.

After careful consideration, it was decided to change the entire plan and make the main haulage road the intake airway, so that it would be possible to course the air through the abandoned areas. This plan worked successfully and brought the desired relief, by driving out the gases that accumulated in the old workings and keepings them free and clear.

Ventilate All Waste Areas with a Separate Air Split

As a result of this experience, I would ventilate all abandoned workings with a separate split of air, wherever this is possible or practicable. Under no consideration, would I permit men to enter an abandoned section with a naked light. It is never safe for a man to enter such a place alone; but two men should accompany each other and carry safety lamps only.

In conclusion, allow me to say I would never permit a fireboss to make an examination of an abandoned area, or an extensive fall, without being accompanied by another competent man.

On more than one occasion, I have known of firebosses being trapped by slides of rock on falls, or overcome with gas when examining an abandoned place. On every such occasion, a second man would be able to rescue his fellow, or give the alarm.

To make abandoned areas safe, these should be periodically examined and kept free from accumulated gases. I have found it practically impossible to completely seal an abandoned section, or heading, and insure its remaining air-tight. Fred W. Sakon.

Johnstown, Pa.

Stopping the Fan on Idle Days

Gases accumulate when fan is stopped —Effect of natural ventilation—Fan run at half-speed to reduce expense.

Attention has been drawn by a Tennessee mine foreman, in the letter, *Coal Age*, Feb. 2, p. 210, to the question of shutting down a mine fan on idle days.

The writer has expressed my views exactly when he says, "A ventilating fan should be run continuously, day and night." Even allowing that the mine is not generating gas and permissible powder is used to reduce the danger of blasting in a dusty mine, I would not favor stopping the fan, except for the purpose of making necessary repairs and then only for as short a time as is required for that purpose.

On entering a mine Monday morning, after the fan has been stopped the previous day when the mine was idle, I have always been able to detect the odor common to abandoned areas where there is little or no ventilation. A considerable time must then elapse before the air in that mine is fit for men to breathe.

Effect of Natural Ventilation When Fan is Idle

Not only is there danger of gases accumulating in void places and rendering the workings unsafe, but it may happen that the entire system of circulation is deranged, by reason of the natural ventilation being opposed to that produced by the fan when in operation. In such a case, dangerous gases may be driven out from the old workings and the danger greatly aggravated.

There is only one condition where I would consent to the stopping of the fan in a mine, during an idle time. If I knew that the natural ventilation in the mine conformed with the circulation produced by the fan and was sufficient to maintain at least half the usual circulation and keep the places free from gas, I might then consent to stopping the fan during an idle time, particularly if the cost of keeping it running was high.

One mine in this region has a natural air volume equal to one-half of the forced ventilation. In that mine, the fan is shut down on all holidays, idle days and Sundays, which I consider safe practice in that instance.

Speed of Fan Reduced to Save Expense

Before closing, allow me to suggest that where the cost of running the fan at the normal rate of speed is high the expense can be considerably lessened by reducing the speed of the fan when the mine is idle. It will often happen that operating the fan at half-speed during an idle time, will keep the mine free from accumulations of gas. This will generally be true in a mine where the air is kept flowing in the same direction, though at a less velocity.

If the fan is run by steam the engine will need to be throttled down to the required speed. But if the fan is electrically driven it will be necessary to either employ a second motor of less horsepower, or provide pulleys of different size that will afford the required reduction of speed in the fan.

Such an arrangement will have the advantage that, in case of accident to the larger motor, the smaller one can be brought into commission and the fan be operated at half-speed while the necessary repairs are made on the other motor. FOREMAN.

Johnstown, Pa.

Inquiries Of General Interest

Blasting Machine-Mined Coal

Coal Mined with Machines in Dip Workings—Water Collects in the Place and Fills the Undercut—Is a Shot Fired in This Coal the Same as a Shot on the Solid?

WE HAVE been much interested in the discussion, in recent issues of *Coal Age*, regarding the shooting of coal off the solid. Naturally, this has raised some question as to what is a solid shot. From some statements that have been made by writers, it would appear that a shot that has been mined may yet be a solid shot, in effect.

In our mines the coal is mined with machines. One section of the mine is running to the dip and makes considerable water. The coal dips, say 8 per cent, at the faces of the rooms in this section.

In one instance, it so happened a place that had been cut with a machine was left standing for a time. Later, when the shotfirer entered the place to fire the shot prepared by the miner he found the cut full of water. The question was asked, "Is not such a shot a shot on the solid since the water has taken the place of the coal in the undercut, which it has filled completely?"

The question has aroused some difference of opinion, here, and the judgment of *Coal Age* and its readers is asked. Some have claimed that the shotfirer who would fire such a shot would be guilty of shooting the coal on the solid, which is contrary to the state mining law, in Colorado. It was said he should refuse to fire such a shot, until the water had been drained from the undercut.

In support of the claim that this is a solid shot, it is stated that water is incompressible, and, when filling the space occupied by the coal, offers a like resistance to the coal. From this viewpoint, the claim of a "solid shot" seems reasonable. SUPERINTENDENT.

Berwind, Colo.

Assuming that this coal has been mined to a depth of, say 6 feet, by a machine, and the undercut or mining later filled with water that drained into it, the coal going to the dip, a shot fired in the coal would not be a shot on the solid, provided the depth of the hole was less than the undercut and the drillhole inclined slightly downward.

It is true that water is incompressible and if the water was to be confined in the space previously occupied by the coal, its presence under the coal would have the same effect as if the cut has not been made. The shot would then be a shot on the solid.

This, however, is not the case. The pressure exerted by the water on the coal is *nil*, unless the free surface of the water stands at a higher level than the top of the cutting. In that case, the water would exert an upward pressure on the coal in the cut, corresponding to the head, which would be slight at the best.

Aside from the question of this being a solid shot, most men would prefer to drain the water from the undercut, before firing the shot, for the reason that the coal would make better loading when the place is comparatively dry. There is no fear, however, that the firing of such a shot, before draining the water from the undercut, would be a violation of the law against solid shooting.

Question for Firebosses

Roof-fall in a place releases gas, after fireboss has made his rounds—Miner is burned — Fireboss's marks effaced by the fall — How can the fireboss prove he examined the place, as required by law?

AS a fireboss I would like the privilege of asking one question that has perplexed me. It is as follows: In a mine worked with open lights, assume that the fireboss has made his customary morning examination and reported his section safe for work. A little later and before the men enter for work, a fall of roof occurs at the face of one of the places examined.

Now, let us assume that the mark required by law to be placed on the face of the coal, by the fireboss, is chipped and lost by reason of the fall. We will also assume that the mine is generating gas which comes from the roof. As a result of the fall a considerable body of gas is released, in the roof, and has accumulated at the face of this room when the miner enters his place for work. Naturally, the man assumes all is safe and starts to look for the mark made by the fireboss, to assure himself on that point. His open light ignites the gas and he is severely burned.

Under these conditions, I want to ask, How is the fireboss to prove that he visited and examined the place and left his mark on the face of the coal, as the law requires? **Joseph Dryna.**

Halvetia, Pa.

This is a good question for our firebosses to consider and we hope to receive practical answers. It represents a condition that may occur at any time and, possibly, place the fireboss in an embarrassing position if he is accused of not having made his examination of the place that morning, because of the absence of any mark on the coal face as evidence of his presence in the place, which is required by law. We submit the question to firebosses, foremen and superintendents, asking for their opinions as to the fireboss being exonerated from all blame in such a case.

Examination Questions Answered

Alabama Firebosses' Examination, Birmingham, Jan. 25-28, 1922

(Selected Questions)

Question—*What care and attention should the safety lamp receive in the lamproom and how should the lamps be inspected before they are passed over to the workmen for use?*

Answer—All lamps received from the men as they come out of the mine should be carefully inspected, cleaned, trimmed and filled by a competent man in charge of the lamproom. Before the lamps are again given to the workmen, at the beginning of a shift, each lamp should be lighted, carefully assembled and inspected thoroughly to detect any flaw or weakness in the lamp. A good plan is to give each man the same lamp, from day to day, and hold him responsible for its condition. To do this, each lamp must be numbered and the miner be given a check with a corresponding number when he returns the lamp. This check should be delivered to the lampman, in exchange for the lamp, at the beginning of each shift.

Question—*How would you proceed to remove a body of gas from a series of breasts pitching 30 deg., the gas having accumulated during a stoppage of the fan?*

Answer—Assuming that the men are all out of the mine, the fireboss, with one or two competent and reliable assistants, should proceed to the intake end of the breasts in question. The work of removing the gas is started by erecting a brattice at the mouth of the first room, at the intake end, to deflect the air into that room. The brattice is extended gradually up the pitch, tests being made with a safety lamp to ascertain the progress of the work. All of the gas must be removed from the first breast, before conducting the air through the crosscut into the adjoining breast to remove gas from that place. It may be necessary to extend a line of brattice from the crosscut; up the pitch, to cause the current to sweep the face of this second breast. In like manner, the gas is driven from each successive breast, until the entire series is free from gas. In performing this work, it may be necessary to increase the ventilating current in that section of the mine.

Question—*What dangers may arise from the improper care and handling of safety lamps by workmen?*

Answer—A safety lamp is never safe if improperly handled or not given the care needed to keep it clean and the flame properly adjusted. Failure, in this regard, may cause the lamp to pass its flame through the gauze and ignite the gas-charged air outside of the lamp and cause an explosion. A safety lamp must be held erect and not tilted so that the flame impinges against the gauze. The lamp must not be exposed to a sudden rush of air or allowed to fall. In a strong air current, it must be shielded to protect it from the full force of the air. In carrying the lamp, it must never be swung.

Question—*If a serious gas explosion should occur in a mine where a large volume of air is being produced by a fan, what would be the possible cause of such an explosion?*

Answer—It is possible for the air current to become charged with a dangerous percentage of gas, by reason of a sudden outflow of gas into the mine should a large feeder be struck in a working place, or opened by a fall of roof on an entry or in a room. In a mine containing a large abandoned area that is not properly ventilated, a heavy fall of roof may drive out a dangerous volume of gas into the live workings. This gas being ignited on the open lights of the miners would cause an explosion. Again, in a dry and dusty mine where dust has been allowed to accumulate at the working faces, a windy or blown-out shot may throw sufficient dust into the air to render it explosive when ignited by the flame of the shot.

Question—*How would you ascertain the quantity of air circulating through a mine?*

Answer—Choose a point in the intake airway where the cross-section is uniform and the passageway straight. Then, having measured the sectional area of the entry at this point, take a reading of one or two minutes with the anemometer, holding the instrument at right angles to the current and at arm's length, moving it about in the passageway so as to obtain a fair average reading over the entire cross-section. The reading of the instrument divided by the number of minutes it is exposed to the current will give the velocity of the air, in feet per minute, approximately. Finally, multiply this velocity by the sectional area of the airway, in square feet, and the product will be the volume of air in circulation, in cubic feet per minute.

Question—*In an airway 8 ft. wide and 6 ft. high, the air has a velocity of 420 ft. per minute; what is the volume of air passing per minute?*

Answer—The sectional area of this airway is $6 \times 8 = 48$ sq.ft. Assuming the given velocity is an average for the entire cross-section, the volume of air passing is 48×420 equals 20,160 cu.ft. per min.

Question—*Suppose, before making your regular examination of a mine, you discovered that a door had been accidentally left open, thus destroying the ventilation of the mine, say how you would proceed to make your examination?*

Answer—In answering this question, we will assume that no one is in the mine other than the fireboss making the examination. In that case, the only danger that would arise from closing the door is the possible existence of a burning feeder or fire that would ignite the gas driven out of the workings when the door is closed. This is a matter which the fireboss must judge before closing the door. If there is any danger that fire exists in the workings, with which the gas will come in contact, the only thing to do, in that case, would be to close the door very gradually, so as to afford opportunity for the dilution of the gas by the air, below the explosive point. If men are working in the mine, they must be withdrawn before closing the door.

Before the fireboss can proceed with his examination, it will be necessary to establish a sufficient circulation through the mine to clear the places of gas. The examination must begin at the intake end and follow the air current proceeding only as fast as the places are found clear.

Question—*Why does firedamp explode in the safety lamp without producing an explosion of the gas with which the lamp is surrounded?*

Answer—Light explosions may take place within the lamp chimney, caused by the entrance of fresh air into the combustion chamber when that is already filled with sharp gas, or a mixture above the explosive point. These explosions take the form of small balloons of gas and are not of sufficient force, generally, to blow the flame through the mesh of the gauze and ignite the gas-charged air surrounding the lamp.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

FIGURES received up to March 20 by the Department of Commerce bear out the conclusion reached in earlier months to the effect that business is gradually working its way back toward normal. This movement is not always evenly distributed among the different industries, but, having regard to those fundamental industries which constitute the backbone of American business, there is a very marked improvement over the conditions recorded a few months ago.

"The most fundamental change that has occurred in recent weeks," the department report states, "is the improvement in the prices of agricultural products. With the exception of tobacco, every agricultural product for which prices are given in the Survey of Current Business made a substantial increase in February over the preceding month. Compared with December, the improvement is more marked.

"In considering cotton production figures for February it must always be borne in mind that this month contains 10 per cent less working days than either January or March, thus the consumption of cotton by textile mills was only 473,073 bales in February, against 526,552 bales in January. This is a reduction of approximately 10 per cent, indicating that the average daily rate of consumption was the same in each month. Compared with a year ago there is an increase of 20 per cent and this occurred in spite of the present widespread labor troubles in the New England mills.

"The final ginning report of the Bureau of the Census gives the 1921 cotton crop as 7,976,665 running bales, compared with 13,270,970 bales in 1920 and 11,325,532 in 1919. Stocks of cotton in mills and warehouses showed a seasonal decline, with the total about 1,000,000 bales less than a year ago.

"Pig-iron production in February amounted to 1,630,000 tons, compared to 1,639,000 tons the month before and 1,937,000 tons in February last year. The February daily average output was 58,214 tons, compared to 53,063 tons in January, and was the highest daily average production since February a year ago.

"Steel-ingot production passed the 2,000,000-ton mark for the first time in twelve months. The February output was 2,069,000 tons in 28 days, against only 1,892,000 tons in the 31 days of January. The unfilled orders of the U. S. Steel Corporation showed a further decline of 101,000 tons, giving a total at the end of February of 4,141,000 tons.

"Building contracts awarded in the 27 Northeastern States during February were valued at $177,365,000, an increase of $11,000,000 over January, in spite of the shorter month. Residential building remained about the same for the two months but there was a noteworthy increase in business buildings, which totaled $39,180,000 in February, compared with $23,696,000 in January.

"All figures available show an improvement in unemployment conditions, with a marked increase in weekly earnings, indicating that mills are running more hours per week.

"All wholesale price-index numbers increased slightly in February. The Department of Labor index shows a rise of 10 points in farm products, with a smaller rise in the food group. Other groups, with the exception of 'miscellaneous,' either remained stationary or registered a slight decline. The index of all commodities rose three points. The retail food-price index remained stationary at 142, compared to 100 as the 1913 average.

Car Loadings Gain 25,873 in Week

Loading of revenue freight totaled 829,128 cars during the week ended on March 11, compared with 803,255 cars the previous week, or an increase of 25,873, according to the American Railway Association. This was the largest loading for any one week since Nov. 5 last, but was only 594 cars below that week. The total for the week exceeded by 128,688 cars the total for the corresponding week in 1921 and by 9,799 the total for the corresponding week in 1920. Coal loadings continued to increase, the total for the week being 204,568 cars, a gain of 7,929 compared with the week before and 68,649 more than were loaded during the corresponding week last year. It also excelled the corresponding week in 1920 by 19,760 cars.

Employment Situation Improves

Improvement in the employment situation, based on reports from widely separated states, is announced by Colonel Arthur Woods, chairman of the emergency committee of the President's conference on unemployment.

Auto Plants Speed Up

The Ford Motor Co. announced last week an increase of 20 per cent in its force, effective at once. Ex-service men and women will be given the preference in all cases wherever possible. Henry Ford says his tractor plant will open April 1, making 400 tractors a day and doubling present production. A large force will be added to the present tractor plant roll of 10,000 men.

An increase in working schedule of from three to fifty hours in various departments each week has been put into effect by the Autocar Co. at its main factory at Ardmore, Pa., because of a heavier run of orders. More than 2,000 employees will benefit. David Ludlum, president of the company, says business so far this year has increased 25 per cent.

Youngstown Steel Mills Busy

Schedules of steel mill operations for last week, as announced by mill offices in the Youngstown district, showed a decided increase, with operation at about 65 per cent of capacity, much the highest point reached in more than a year. Orders were received at Farrell, Pa., for reopening eight open-hearth furnaces there of the Carnegie Steel Co., which had been idle for a year.

Pig iron production records were broken at the No. 2 furnace of the Carnegie Steel Co., New Castle, Pa., on March 8. In twenty-four hours the furnace produced 719 tons of iron. The previous record, held at the Youngstown furnace, was 711 tons.

Chicago Coal Men Not "Strong" for Hoover Trade Association Code

Opinion Is That It Would Virtually Amount to Government Control of Business—Time Wasted Would Nullify Value to Public

THERE is no enthusiasm among coal men of Chicago—the world's greatest coal market and headquarters of many large operators—for Secretary Herbert Hoover's "code of practice" for trade associations. The conversational verdict among these men against the "code" is that it would amount to governmental control of business and that it would slow down the dissemination of trade data to a point of worthlessness. Most men doubt whether open-price reports can be resumed in any helpful form. The "code" was informally set forth a month ago after Secretary Hoover and Attorney General Daugherty had jointly considered the matter. It was intended to help outline to American business the field of activities which trade associations could cover without violation of law. That outline had been made confusingly indistinct by the Supreme Court decision against the practices of the American Hardwood Manufacturers' Association in the American Column and Lumber case.

In the correspondence between Secretary Hoover and Attorney General Daugherty last month, published in full in *Coal Age*, the informal "code" presented by Mr. Hoover and approved tentatively by Mr. Daugherty made plain that illegal acts of trade associations are: Conspiracy to enhance prices, to curtail production or suppress competition, arbitrary establishment of .production costs, the adoption of uniform trade marks or labels to be used by natural competitors who are members of the same association, which would tend to result in the same price being charged for all articles of the same class bearing identical labels, and the collection of credit information in order to create blacklists.

ELEVEN POINTS COVERED BY HOOVER CODE

The "eleven points" of Mr. Hoover's code, which cover permissible acts by associations are these: (1) Adoption of standard cost systems; (2) uniform trade phrases, (3) standard grades, forms of contracts, machinery and processes; (4) the collection of credit information not for blacklists, (5) the placing of insurance for members; (6) co-operative advertising; (7) promotion of employees' welfare; (8) management of legislative questions and litigation; (9) cultivation of closer relations with the government; (10) the collection of statistics of production, costs, prices, consumption and distribution, and dissemination of reports through the Department of Commerce to members and the public; (11) compilation (from members' price reports on closed transactions) of consolidated statements of average prices to be made public through the Department of Commerce.

"Just imagine us sending all that information to the Department of Commerce!" commented the president of a big operating company. "With the detail which seems to be required, can you think of anything which would constitute a more definite step toward government control? I can't. And even if the material were properly handled by the department in its routine work, imagine what a mine of information there would be down there in Washington always tempting some of those—those—well you know the types of men infesting Congress who constantly itch to attack 'big business' and corporations. Would they be snooping through that data daily looking for a chance to start something just for the sake of personal publicity? They would—not only daily but Sundays. This company will never send such reports to Washington willingly."

There are others in Chicago who regard the "code" in the same light, though men earnestly trying to think out a way for their associations to use it declare the fear of government control is baseless. They interpret the "code" to require the sending to Washington of insufficient detail to justify such a fear.

There is tribute to Secretary Hoover's standing with coal men in the fact that every man who expressed himself on the question invariably prefaced his remarks by saying he had great confidence in Mr. Hoover and was sure that the Secretary had nothing but the best interests of American business at heart when he endeavored to work out the "code." Almost to a man they said they were willing to "go the whole distance" with Mr. Hoover if he developed a complete and definite program for trade associations.

"But," several of them suggest, "while this program of reporting to the Department of Commerce may work fine while Mr. Hoover is head of the department, what happens when somebody else takes Mr. Hoover's place? We know he is fully in sympathy with honest big business, but think of the trouble that could be caused by a man who wasn't! We have to remember that Mr. Hoover is an unusual man for the Cabinet, and won't be there forever."

There is so much uncertainty in the minds of men in the trade over the legitimacy of open-price reports under the Hoover "code" that nobody is willing to urge his association to resume them, if they have been dropped, or to continue them any longer in the case of those associations which are now issuing them. There is a real desire on the part of most companies for such reports. So the hope is frequently expressed that the government will make its position clearer on that point and that full reports will be permitted.

A price-cutting war after the coming miners' strike is thought by a good many men to be inevitable, especially if wage agreement with miners are made by districts in union fields. "In that case," pointed out an observer, "there will be a lot of fellows who won't care about turning in all these data on their costs of production and their sales. Some of them right now are getting ready for it. You won't hear them urging immediate resumption of open price reports."

But if reports of prices or production or stocks must go through Washington and be published from there to association members and the public, the opinion is they might as well be scrapped. They would be a week old at best and would give no indication of immediate market conditions. So it is hoped, in the interest of associations, that the government can modify its program somehow to meet this.

E. W. D.

Bids Range $5.39-$5.90 on 300,000 Tons of Coal for New Haven Railroad

BIDS opened on March 20 by the New York, New Haven & Hartford Railroad Co. for 300,000 tons of coal to be delivered alongside their piers at South Boston disclosed the following bidders:

	Coal	Price
W. A. Marshall & Co.	....	$5.55
Smokeless Coal & Dock Co.	Fairmont	5.39
Consolidation Coal Co.	Fairmont	5.59
Iron Trade Products Co.	Kanawha	5.56
Iron Trade Products Co.	Fairmont	5.67
Keystone Coal & Coke Co.	Greensburg	5.85
Valley Camp Coal Co.	....	5.65
Eastern Coal & Export Corp.	....	5.55
Maryland Coal & Coke Co.	Kanawha	5.65
Karm Terminal Co.	Fairmont	5.47½
New England Coal & Coke Co.	Fairmont	5.39
New England Coal & Coke Co.	Toms Creek	5.45
New England Coal & Coke Co.	Federal	5.49
New England Coal & Coke Co.	Kanawha	5.49
Moore & Co.	Fairmont-Freeport	5.95
Emmons Coal Mining Co.	Fairmont-Freeport	5.40
Dexter-Carpenter, Inc.	Kanawha	5.74
Moore & Co.	Parker Run	5.75
Gano Moore Coal Mining Co.	Fairmont-Freeport	5.90
Lake & Export Coal Co.	Kanawha	5.60
Spring Coal Co.	Long Branch	5.75
G. E. Warren Coal Corp.	Fairmont	5.50
C. H. Sprague & Son	Island Creek	5.80

Mine Breaks All Records, Including Its Own

HOW insecure are production records! On March 9, 1922, the Bell & Zoller Mine No. 1, located at Zeigler, Ill., hoisted 7,214 tons, as noted in *Coal Age* of March 23, 1922, page 499. On March 22, or less than two weeks later, this same mine had broken its own record by raising 7,283 tons.

This production entailed the dumping of 1,944 mine cars, the hoisting of 878 skips and the loading of 162 railroad cars. Edward Prudent is manager of this operation.

Who can beat Mine No. 1 at Zeigler?

Coal Stocks Now Equal Those of Armistice Day*

Consumers Had 52,500,000 Tons on Hand March 1—Coal Leaving Mines Recently Expected to Swell Total to 63,000,000 Tons April 1—At Present Consumption Rate It Would Last 43 Days If Evenly Distributed

By F. G. Tryon and W. F. McKenney

THERE are some aspects of the government report, "Commercial Stocks of Anthracite and Bituminous Coal as of March 1, 1922," prepared jointly by the Bureau of the Census and the Geological Survey, which deserve emphasis in view of the possibility of a suspension on April 1. The official count showed a total of 52,500,000 tons in the hands of consumers on March 1. At the rate coal has been leaving the mines recently it is clear that by April 1 this reserve will have increased to at least 63,000,000 tons; perhaps more. In other words, the United States will enter the stoppage, if one occurs, with a reserve of coal above ground equal in tons to that on the day of the Armistice. Considering the low rate at which coal is now being consumed, the reserve is even greater than that which had been accumulated on Armistice Day.

It may come as a surprise to many who are watching the production statistics to learn that stocks on March 1 were only 4,500,000 tons greater than those recorded two months before, at the beginning of the year. The quantity of coal produced in January and February was indeed some 10,000,000 tons in excess of consumption, but it had not all reached the consumer by March 1. There is a lag of perhaps two weeks between the production of coal and its delivery to the user, so that the quantity received by consumers for current use and for storage in the months of January and February was that produced between Dec. 15 and Feb. 15, or only 71,000,000 tons. By the time April 1 arrives the heavy volume of coal started on its way from the mines in recent weeks will have reached its destination, and we know that much of it will have gone into stock piles. In fact, if we could imagine a complete stoppage of production, something which has never happened in our bituminous industry, coal would continue to flow to the consumer for some days after the stoppage began.

In reckoning the length of time which a given reserve might last, it is of course impossible to count on withdrawing all of the coal from storage. A certain amount—not less than 20,000,000 tons, to judge from the experience of 1920—is necessary to insure continuous operation. It is like the raw material in process at a manufacturing plant, which has inventory value but cannot be withdrawn without stopping the works. Again, imposing figures of average days' supply may give a false sense of protection. The average must be used in order to make a mass of figures comprehensible, but when we say that the reserve on March 1 was sufficient to last 43 days at the present rate of consumption, it does not mean that all consumers had 43 days' supply. Stocks are never evenly divided. No American city is without consumers who, through lack of necessary space or sheer neglect carry no reserve against an interruption.

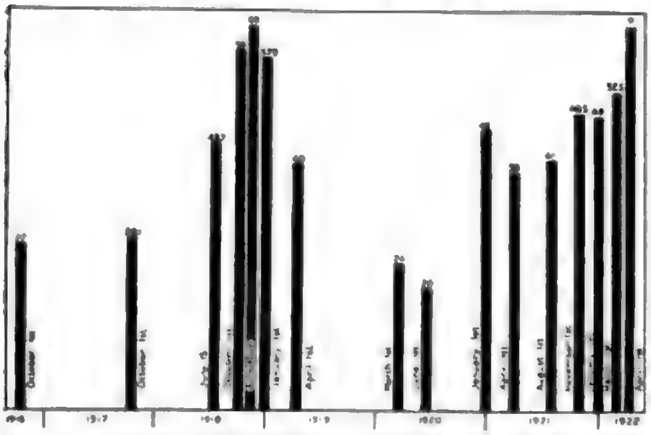


FIG. 1. TOTAL COMMERCIAL STOCKS OF BITUMINOUS COAL, OCT. 1, 1916, TO MARCH 1, 1922, WITH AN ESTIMATE FOR APRIL 1

Figures represent million net tons and include coal in hands of railroads, industrial consumers, public utilities and retailers. Coal for steamship fuel, on Lake docks and in transit is not included. Figures for 1921 and 1922 are subject to revision.

ESTIMATED TOTAL COMMERCIAL STOCKS OF BITUMINOUS COAL IN THE UNITED STATES(a)

(In Net Tons)

Oct. 1, 1916	27,000,000	June 1, 1920	20,000,000
Oct. 1, 1917	28,100,000	Jan. 1, 1921	(b)45,800,000
July 15, 1918	39,700,000	April 1, 1921	(b)39,500,000
Oct. 1, 1918	59,000,000	Aug. 1, 1921	(b)41,100,000
Day of the Armistice	63,000,000	Nov. 1, 1921	(b)48,500,000
Jan. 1, 1919	57,900,000	Jan. 1, 1922	(b)48,000,000
April 1, 1919	40,400,000	March 1, 1922	(b)52,500,000
March 1, 1920	24,000,000	April 1, 1922 At least	63,000,000

(a) Coal in transit and on Lake docks not included. The estimates here given are subject to a considerable margin of error. The figure for March 1, 1922, may lie anywhere between 50,000,000 and 56,000,000 tons. (b) Subject to revision.

Reserve in days' supply by principal classes of consumers as of March 1 compared with what was on hand Nov. 11, 1918, the day of the Armistice, is shown in Fig. 2. The average stocks for all consumers on March 1 were sufficient for 43 days, only 2 days less than the stocks on Armistice Day. Examination of the diagram shows that the position of the different classes of consumers was not the same. While the railroads had much more coal than at the end of the war and while byproduct coke and steel plants and the public utilities carried larger reserves in terms of days' supply, the general industrials and the retail dealers held much less, whether measured in tons or in the length of time the supply would last.

The rate of consumption on which these reserves are calculated is the average for the months of January and February. Were business to revive suddenly the days' supply would become less. At normal activity in the coal-using industries the average supply would be not 43 days, but 34 days.

DAYS' SUPPLY OF BITUMINOUS COAL IN HANDS OF VARIOUS CLASSES OF CONSUMERS IN THE UNITED STATES, JULY 15, 1918, TO MARCH 1, 1922

(Figures represent number of days supply would last at current rate of consumption at time of stock taking.)

	July 15, 1918	Nov. 11, 1918	Jan. 1, 1919	Apr. 1, 1919	Mar. 1, 1920	June 1, 1920	Jan. 1, 1921	Apr. 1, 1921	Aug. 1, 1921	Nov. 1, 1921	Jan. 1, 1922	Mar. 1, 1922
Byproduct coke plants	28	35	32	23	15a	8a	28	29	31	38	42	39
Steel plants	27	45	42	35	9a	11a	42	38	46	46	48	48
Other industrials	48	71	65	47	27	24	64	47	56	67	51	56
Artificial gas plants	72	85	81	58	31	22	55	66	79	87	89	82
Electric utilities	39	49	49	48	21	22	44	48	44	54	51	54
Coal dealers, bituminous	15	37	39	25	13	10	30	26	42	46	33	23
Railroads	25	31	32	(b)	11a	10a	23a	24a	(b)	31a	35a	42a
Total bituminous	31	45	42	31	18	15	39a	36a	39a	43a	41a	43a

(a) Estimated from incomplete data: subject to important revision. (b) No data.

While the change from Jan. 1 to March 1 was generally upward, there were some districts of the country which departed sharply from the average. Every state in New England, every state in the Lake dock territory, and five of the far Western States allowed their stocks to decline. Consumers in these sections seemed to feel that there was little occasion for increasing their reserves. In the Southeastern states March 1 found stocks at almost the same level as that reported two months before, but in the Middle Atlantic States, the Central Mississippi Valley and the Southwestern Interstate group, stocks uniformly increased and for the most part increased sharply. For example, while in New England industrials had 18 per cent less coal on March 1 than on Jan. 1, the same class of Illinois consumers had increased their stocks by 37 per cent. In Indiana the increase was 38 per cent; in Ohio, 36 per cent; in Iowa, 36 per cent; in Kansas, 40 per cent, and so forth, with singular unanimity in those states dependent upon the Central Competitive Field—Pennsylvania and the Southwestern Interstate region.

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Much the same difference in policy in the different consuming sections is revealed by the stocks of electric utilities. In New England stocks declined; in the Central West and Middle Atlantic States they increased. The Lake dock territory, like New England, reported less than on Jan. 1.

Geographical Distribution of Stocks on March 1

The best guide to the condition of stocks in different consuming sections is furnished by the class of general industrial consumers other than steel and byproduct coke plants. From the map in Fig. 3 it will be seen that only four states showed average stocks in excess of 90 days. In New England, southern Michigan, Minnesota, New York and New Jersey, some of the Rocky Mountain States, Georgia and Florida the reserves ranged from 60 to 90 days. In the Mississippi Valley the average varied from 30 to 60 days. It appears therefore that in spite of the decline in New England and the Lake dock territory above noted, consumers in those districts remote from the mines were still well protected.

Stocks of Bituminous Coal by Types of Consumers

Railroad-Fuel Stocks—The American Railway Association has courteously supplied data for its members on the quantity of coal held by the railroads on March 1 for railroad fuel and all other railroad use. The roads already heard from have a total of 14,850,000 tons, and it is expected that complete reports will show more than 16,000,000 tons. As the largest stocks of record in the past are 13,640,000 tons on Jan. 1, 1919, it will be seen that the railroads have accumulated what is for them an enormous reserve of coal. It is sufficient to last on the average 42 days at the present rate of consumption. The stocks on the day of the Armistice were sufficient for only 31 days, part of the difference being the greater requirements of the roads at that time.

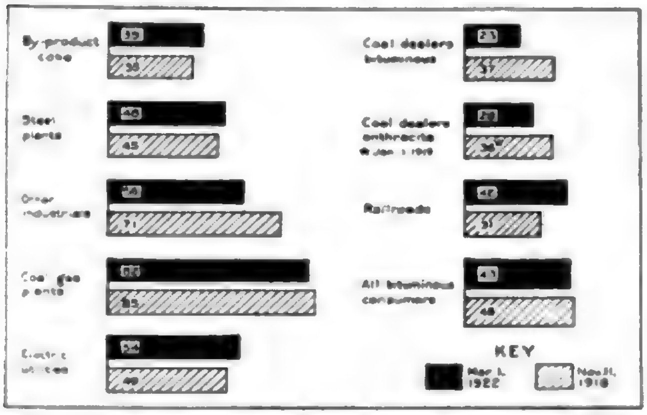


FIG. 2. DAYS' SUPPLY HELD BY DIFFERENT CLASSES OF CONSUMERS ON MARCH 1, 1922, AND ON ARMISTICE DAY

At the rate coal was being burned in January and February, the stocks on March 1, 1922, were sufficient to last 43 days. This was almost as long as the stocks on the Day of the Armistice would have lasted at the higher rate of consumption then prevailing. Present stocks of byproduct and steel plants, the railroads and public utilities compare favorably with those on Armistice Day. Coal dealers and general industrials, however, have less.

Coal-Gas Plants—The coal-gas plants of New England, the Middle Atlantic States and Michigan are heavily supplied with coal. In 7 states where coal gas is largely used the reserves exceed 90 days; in fact, the average for the country on March 1 was 82 days. In some sections, however, the plants are carrying much smaller stocks, sufficient for less than 30 days.

Electric Utilities—The electric public utilities are heavily stocked. The average supply on Jan. 1 was 51 days, and by March 1 this had been increased to 54 days.

Retail Coal Dealers—Retail dealers as a class were the only large group of consumers to report smaller stocks on March 1 than at the beginning of the year. At the rate their customers were calling for soft coal in the two months of January and February, coal dealers had stocks sufficient to last 23 days. In terms of tons on hand, however, their reserves were slightly greater than those of April 1, a year ago, and 72 per cent greater than on March 1, 1920, at which time coal was scarce.

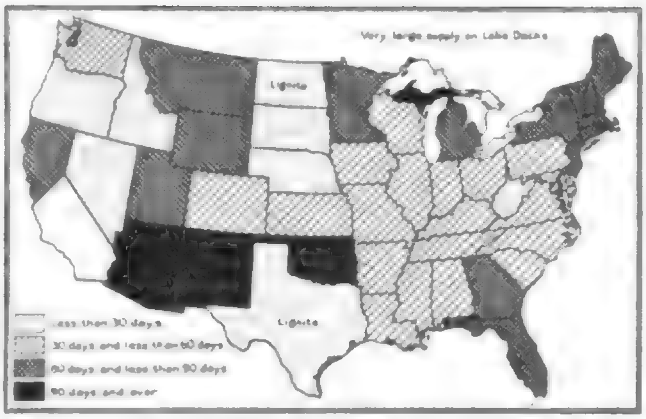

Very large supply on Lake Docks
Lignite
Lignite
Less than 30 days
30 days and less than 60 days
60 days and less than 90 days
90 days and over

FIG. 3. DAYS' SUPPLY OF SOFT COAL ON HAND AT INDUSTRIAL PLANTS ON MARCH 1, 1922

At the rate of consumption prevailing in January and February, stocks at industrial plants other than steel and byproduct coke would last on the average 56 days. How the supply varied from state to state is shown in the diagram. The darker the shading, the heavier are the stocks. If business should revive and consumption increase, the stocks expressed in days' supply would be smaller. Based on reports from 2,379 plants.

Industrial Consumers—The stocks held by industrials varied from 9 days in North Dakota to over 100 days in Oklahoma, New Mexico, Arizona and the northern peninsula of Michigan. New England as a whole carried a reserve of 71 days, and for the United States the average was 56 days.

Byproduct and Steel Plants—Practically complete reports from the byproduct coke and steel plants showed the following reserves on March 1, at the rate of consumption prevailing during January and February:

BYPRODUCT PLANTS		STEEL WORKS	
Low volatile	55 days	Steam coal	42 days
High volatile	34 days	Gas coal	56 days
Average	39 days	Average	45 days

Bituminous Coal in Transit

By far the largest item of the reserves in transit is the quantity of coal on the Upper Lake docks. Normally the dock companies report a maximum at the close of navigation, and expect to carry over a nominal tonnage to the following season. So light has been the movement off the

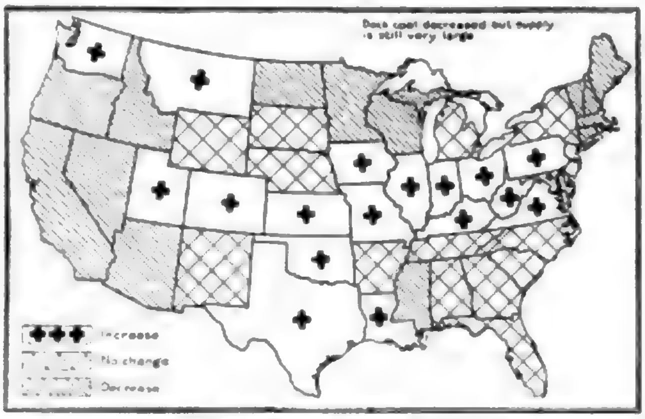


FIG. 4. CHANGES IN STOCKS FROM JAN. 1 TO MARCH 1 AT INDUSTRIAL PLANTS OTHER THAN STEEL AND BYPRODUCT

In the months of January and February industrial consumers in New England, the Lake dock territory and five of the Far Western States allowed their stocks to decline. A different policy was pursued by industrials in the Middle Atlantic States, the Central Mississippi Valley and the Southwest Interstate Region, where without exception stocks increased sharply. Between these areas of increase and decrease were states where stocks showed no change. This was the general condition in the Southeast.

docks during the present winter, that on March 1 a total of 5,160,000 tons remained on hand, and it appears unlikely that the reserve will be less than 4,250,000 tons on April 1. For the following statistics the Geological Survey is indebted to the Northwestern Coal Dock Operators' Association:

August 1, 1921	8,188,639 net tons
November 1, 1921	8,824,297 net tons
January 1, 1922	7,150,654 net tons
March 1, 1922	5,160,452 net tons

These figures are exclusive of coal on the private docks of industrial consumers, such as the copper- and iron-mining companies of northern Michigan and Minnesota. The stocks of these latter companies, however, are included in the commercial storage.

Estimate of Stocks of Anthracite

Concerning the amount of anthracite in cellars of householders, no statistics are to be had. It is a common belief among the trade that consumers are carrying less anthracite than is customary at this season of the year. The stocks in the yards of retail dealers are still considerable, though showing a sharp decrease since Jan. 1. No complete count has been made by the government, but a selected list of 642 dealers from whom reports have long been received carried 20 per cent more coal than on Jan. 1, 1919, and about the same amount as on March 1 a year ago. At the rate coal was being called for by householders in January and February, the stocks reported were sufficient to last 28 days. With the approach of milder weather the same tonnage would, of course, suffice for a longer time.

ANTHRACITE IN YARDS OF SELECTED LIST OF RETAILERS ( )

Date	Net Tons	Days' Supply (b)	Date	Net Tons	Days' Supply (b)
1919—Jan. 1	968,746	36	1921—Aug. 1	1,573,427	50
Apr. 1	837,220	31	Nov. 1	1,460,524	47
1920—Mar. 1	787,100	21	Dec. 1	1,601,409	50
June 1	589,318	15	1922—Jan. 1	1,393,551	44
1921—Jan. 1	740,034	24	Mar. 1	1,169,160	28
Apr. 1	1,213,252	16			

(a) Based on statements from 642 identical dealers who reported on each date.
(b) Calculated at current rate of delivery to consumers, which varies.

Anthracite in Transit—The Upper Lake docks, according to the Northern Coal Dock Operators' Association, held 821,448 net tons of domestic sizes on March 1. At the close of navigation stocks had been approximately 1,300,000 tons. The quantity of anthracite on hand at tidewater piers on March 1 was not unusual.

Anthracite in Producers' Storage—The producers have not authorized the publication of their stocks as of Jan. 1 or March 1. On Nov. 1 they reported a total of 4,500,000 gross tons in storage at Eastern points, of which 1,800,000 tons was in domestic sizes and 2,700,000 in steam sizes. Since Nov. 1 production has been fairly well maintained, considering the weather and the industrial depression.

Stocks of Coke at Byproduct Coke Plants—A factor of importance in the present reserves of domestic fuel is the accumulation of large stocks of byproduct coke at those plants which have contracts for the supply of gas to municipalities. Reports from 19 such byproduct plants show a total of 980,804 tons on March 1, and there can be no doubt that including what may be on hand at other plants not reporting at this writing (March 25), the total is in excess of a million tons.

Daugherty's Attitude on Eve of Strike

ATTORNEY GENERAL DAUGHERTY had issued no formal statement up to Saturday, March 25, on the strike situation. Everything that has been said has been in verbal statements to the correspondents. He said he had given assurances that there would be no action taken under the Sherman Law against the operators and miners if they met to discuss the wage scale and working conditions, but added that he would not hesitate to employ the injunction weapon, if necessary. The miners, he said, have a right to strike but have no right to interfere with others taking their places; hence he would brook no resort to violence.

Bill Proposes Coal Commission to Prevent Strike by Publicity

Representative Bland's Measure, Providing for Congressional Hearing, Referred to Labor Committee —Senator Borah Starts Inquiry

SENATOR BORAH, new chairman of the Senate Committee on Labor, stated on Monday, March 27, that he is making inquiries as to why the operators refused to meet the coal miners in a national conference. He intimated that if he should fail to obtain a satisfactory explanation he would institute a more formal investigation.

A bill creating a coal commission to serve for such time as the House Committee on Labor, to which it was referred, may determine, but designed to prevent a coal strike at this time by publicity through a Congressional hearing on the subject, was introduced in the House March 23 by Representative Bland, of Indiana. Mr. Bland had previously made a speech in the House urging government action to force a conference between the operators and miners. His bill leaves for the determination of the Labor Committee the time at which this commission would report, as also the compensation of its members and the time it would serve.

At the request of Representative Bland the House Committee on Labor will begin hearings Thursday on his bill, which provides that a commission investigate conditions in the industry, particularly in regard to wages. The Department of Labor and representatives of the national organizations of operators and miners are invited to appear.

The title of the measure is "to establish a commission to inquire into and report on conditions in the coal industry." It authorizes the appointment of three members for such commission by the President, without their confirmation by the Senate, as is usually the case with Congressional commissions, and without any distinction as to whether they shall represent capital, labor or the public, which has been the custom heretofore.

Finds Living Costs in Anthracite Regions Down 20.7-23.2 Per Cent from Peak

THE cost of living for families in the anthracite regions, according to a survey just completed by the National Industrial Conference Board, decreased from 20.7 per cent to 23.2 per cent from the peak in July, 1920, to February, 1922.

This investigation shows that the minimum cost of maintaining a fair American standard of living among anthracite mine workers' families, according to conditions actually prevailing, in February, 1922, varied from $897.34 a year for a family consisting of a man, woman and one child living in company-owned houses to $1,475.45 a year for a similar family with four children living in commercially-owned houses. Single men paying for board and lodging, on the other hand, because the cost of their necessities is normally considerably greater than would be their proportional share of the cost in a family group, required $703.96 a year to live at a fair minimum American standard in the anthracite region in February, 1922.

There were slight variations in these figures for the different sections of the anthracite coal fields but the figures for the area as a whole are sufficiently representative of conditions generally prevailing. In addition to the comparatively large centers such as Scranton, Wilkes-Barre, Hazleton, Pottsville, Shamokin and Shenandoah, 28 smaller communities were visited.

THE AUTHORITY OF THE FEDERAL TRADE COMMISSION to require cost data of the coal and other basic industries is soon to be tested in the Court of Appeals of the District of Columbia. The Federal Trade Commission has appealed the case to this court, the District of Columbia Supreme Court having sustained the complaint that the commission lacks this power.

Operators' Insistence on Wage Cut and Union Reforms Believed to Presage Long Struggle

By Paul Wooton

Washington Correspondent of Coal Age

THAT the coal operators made a tactical blunder, likely to have far-reaching consequences, when they failed to meet the United Mine Workers' representatives in conference, is the general belief in legislative and departmental circles in Washington. It is believed that this action on the part of the operators has cost the coal-producing industry heavily when expressed in terms of public opinion. To undertake to settle labor questions on a state basis is regarded in those circles as a step backward. The next step, it is feared, will be to attempt to return to district agreements, from which it would be only a short additional step to the negotiation of wage agreements on an individual basis.

Those who have been in intimate touch with coal operators in union territory during recent weeks declare that there is no desire to get rid of the miners' union. The advantages of collective bargaining are in such contrast with the confusion of other days that most of these operators would not cripple the union if they could. They are all determined that certain fundamental reforms in the union must be brought about and they are more than willing to enter into a finish fight at this time in an effort to effect these reforms.

There probably are a score of changes the operators would like to put into effect. It is only necessary to mention two of them—the check-off and machine differentials—to indicate that they cannot be made without a hard fight. The apparent determination of the operators to insist not only on a substantial reduction in wages but on these even more fundamental matters influences many to believe that the strike will be long drawn out. There are differences of opinion on that point. Some of the coal specialists in Washington believe the strike will be short-lived. That conclusion is based on the belief that the miners after a short period will be willing to make wage concessions. By that time the operators will have seen enough non-union coal moving into their markets to persuade them to concede the other points involved. In that connection, however, it is pointed out that the strike of 1910 in mid-continental territory lasted five and one-half months under comparable conditions.

Some of those predicting a short strike apparently are being influenced by the lack of money in the mine workers' treasury. Others point out, however, that the Illinois miners are in a good position financially, as are the anthracite workers. It is certain that financial aid will be extended by other unions, so that this need not limit the strike, especially in view of the fact that the miners would be a little better off if the strike were settled. With coal stocks at their present level and with the ability of the non-union mines to keep their wages a notch below those of the union fields it is apparent to all that there will not be much work during the summer, even if there should be an early settlement of the strike.

There is a disinclination this week on the part of those connected with coal activities in Washington to venture predictions. Predictions made on the eve of an event are particularly glaring if they are wrong. This applies particularly to the anthracite situation. There is a general tendency to admit that there is a considerable chance for some gentlemen's agreement being made which would insure settlement before the strike had lasted long.

Average Annual Earnings in 200 Bituminous Mines Oct. 31, 1921, Was $1,357.40

A REPORT of the Bureau of Labor Statistics of the Department of Labor presented to the Senate by Senator Willis, of Ohio, states that the average earnings of bituminous coal miners in Alabama, Colorado, Illinois, Indiana, Kentucky, Ohio, Pennsylvania, Utah, West Virginia, Washington and Wyoming during the past year has been $1,357.40. The report covers an investigation of 200 mines for the year ending Oct. 31 last. It shows that the average number of days which these mines operated was 195; that the highest number of days operated by any mine in the group was 310 and the lowest 71.

The report gives numerous statistical tables on hours and earnings in bituminous mines for the fall and winter of 1921, covering 52,784 employees in the states named. In a summary accompanying the statistics it is stated that few mines even approached full time work, many mines being shut down, and the men working as low as one and two days in one period. Among the miners reported on were 22,012 loaders, 8,429 pick or hand miners and 2,256 machine miners.

Discussing statistics given on hours of operation of bituminous mines, the bureau says it believes its report fairly represents conditions as to the irregularity of work in bituminous mines of the country. The statistics on working time in bituminous mines is from October, 1921, to February, 1922, and covers in addition to the states named above the following: Arkansas, Iowa, Kansas, Kentucky, Maryland, Missouri, Montana, North Dakota, Oklahoma and Texas.

The report gives tables covering the following: Tonnage rates for machine mining, loading and pick mining; days and hours of operation in half month, tons produced, days of operation and days closed in year, and average earnings per hour by states and mines; date of payroll of beginning of wage peak, date and amount of reduction of wages, overtime rate, bonus, deductions from earnings and hours per day, by states and mines; number of mines, number of loaders, pick miners and machine miners, combined; average number of starts, days; average number days of operation during year and estimated earnings for year by states; number of mines and employees, average number of starts, days; and average hours and earnings, by occupation and state, tonnage workers and time workers.

NUMEROUS APPEALS TO THE PRESIDENT to take action to prevent a strike and, failing in that, to have the government take over the operation of the mines, have been made. The People's Reconstruction League asked that the government operate the mines and that authority therefor be obtained through enactment of the Kenyon-Newton bills regulating the coal industry. These bills authorize government control on certification of an emergency by the Federal Trade Commission. A statement of the league issued by its secretary, B. C. Marsh, asked that the administration take action "to compel the profiteering coal operators to pay fair wages to all operatives." The Federation of Trades of Atlanta, in a message taken to the White House by Representative Upshaw, of Georgia, asked the President to compel the operators and miners to confer, and, failing a wage agreement, for the government to take over and operate the mines.

IT SEEMS NECESSARY to have a coal strike voted by the union and officially ordered by its officers before there's any chance of considering a settlement.—*New York Sun.*

HERBERT HOOVER WARNS of an impending coal strike; but, in comparison with all our other troubles, that is only a miner matter.—*Nashville Southern Lumberman.*

THE MINERS APPARENTLY THINK that their goal is within striking distance.—*Norfolk Virginian-Pilot.*

All Coal Fields North of Rio Grande to Strike April 1

WITHOUT waiting for the outcome of the referendum vote and while still conferring with the anthracite operators, even without waiting until the expiration of the present agreement, John L. Lewis, president of the United Mine Workers of America, declared on March 21 a strike beginning April 1 of all mine workers in the United States and Canada, Nova Scotia alone being excepted.

In all probability all the union and non-union workers in union districts in Nova Scotia and elsewhere will strike on April 1, and Mr. Lewis hopes that even in non-union districts strikes will occur. Some areas, however, like those in Tennessee, parts of southeastern Kentucky and Colorado, which by some are rated as union, have accepted reductions. They may continue at work for this reason. The vote on the strike, though not all in, is said by Secretary-Treasurer Green to run 19 to 1 in favor of a suspension.

The combined funds of the International Union, its districts and locals with which to carry on the strike will total between $5,000,000 and $6,000,000, but it is most irregularly distributed. Illinois has about $2,000,000 of this money. Whatever it is, it is little enough for a strike in which 500,000 men in the United States alone will be idle and which will involve 800,000 men in the United States if the union strikers are joined by the non-union. The union cannot pay strike benefits; it can only establish commissaries and give other insignificant relief. The union mine workers, though working more steadily of late, are not in financial condition to support themselves nor are the union districts, whether farming or industrial, able to give much support, owing to the hardness of the times.

The policy committee of the United Mine Workers, 116 strong, met in Cleveland on Friday, March 24. At this meeting the strike call of President Lewis, issued on March 21, was approved. The most important result of the meeting was the curbing of Frank Farrington, who had threatened to make a separate settlement in Illinois.

To Proselyte in Non-Union Fields

Mr. Lewis believes that the infiltration of union men into the non-union regions of southern West Virginia, Virginia and southeastern Kentucky will make those regions ready to respond to a call from the union, and the policy committee decided to make such a call to the men in those regions in the hope that they would cast their lot with the union men. It appears from later advices that the United Mine Workers is planning to flood the non-union fields with agitators and to distribute leaflets in the mining valleys by airplane.

Lawrence Dwyer, of Beckley, who is a member of the International board, read a resolution of the joint protective board of the Norfolk & Western Ry. employees, including members of all four brotherhoods. This indorsed a joint strike action of mine and railroad workers. It is certain that even without a strike the railroad workers could do much to hinder the flow of coal from the unorganized regions of West Virginia.

Meantime, Warren S. Stone, president of the Brotherhood of Locomotive Engineers, and W. L. Lee, chief of the Brotherhood of Railroad Trainmen, met Mr. Lewis in Cleveland, the first at least at his own initiative, and so created the idea that the railroad men were seeking a way to assist in the strike.

Apparently the Kansas Industrial Relations Court expects to keep the Kansas mines working. On March 24 it summoned the operators and mine workers to a meeting at Topeka to be held March 31, at which they will be required to give testimony on mining conditions in Kansas on which an order for the running of the mines may be based.

It has already been said that Nova Scotia has been excepted in the call for a strike. Probably this exception was made because Nova Scotia operators have already met with the Mine Workers leaders, have submitted a proposal, have put the dispute up to arbitration, and because consequently Nova Scotia has no justification for striking. However, the mine workers of that district probably will strike, as they have rejected the award of the arbitrators and have repudiated the more favorable agreement that the operators offered in its stead and which the leaders of the Mine Workers tentatively accepted. They are alleged to be following the advice of Secretary-Treasurer MacLachlan to "soldier" on the jobs which they are filling, and some have been shifted to less desirable places in consequence. The Nova Scotia miners, however, are still working at wages in accord with the Gillen arbitration award.

In British Columbia the operators have offered a 46-per cent reduction and the mine workers will strike for their present wages on April 1. They may try to get a board of inquiry under the Lemieux or Industrial Disputes Investigation Act. But to this the operators do not take kindly, for the mine workers demand the old scale till a new one is provided by the board, and they reserve the right to accept or reject the ruling of that board when made. In view of what has happened in Nova Scotia, where arbitration and tentative agreements of union officials have been disregarded by the mine workers and where sabotage is being tried as a means of bringing an unfair pressure on the employers, the operators of the Western Canadian Coal Operators' Association are not disposed to allow the reduction of wages to be delayed till the board decides, for fear that when decision is made it will be regarded by the mine workers as being in no sense binding on them and their leaders.

Following reports from Washington that government officials have asked the Shipping Board to consider a scheme to carry coal as ballast on ships plying between the United States and coal-producing countries, it was announced that the question of whether members of the International Seamen's Union would assist in the transportation of British coal to the United States during the strike had been referred to the officials of the international union in Washington.

Anthracite Men to Let Maintenance Forces Work; No Settlement in Sight

THE first three conferences of the joint subcommittee of anthracite operators and miners selected to agree upon a new wage agreement, held at the Union League Club, New York City, on March 21, 22 and 23, were taken up with a general discussion of the demands presented by the miners. With the "decks cleared" John L. Lewis, International president of the Miners' organization, says the miners will now be prepared to offer statistics and analysis to back up their demands. It is not expected that the operators will present their counter demands as to how much wages ought to be reduced until after the completion of the miners' arguments.

The sessions of the joint subcommittee were adjourned on March 23 until March 27 to permit President Lewis and other members of the organization to attend the meeting of the general policies committee of the United Mine Workers of America at Cleveland.

What probably was the most important development of the situation thus far, from the viewpoint of the miners, was the conference in New York City on the night of March 22 between President Lewis and a delegation representing the American Federation of Labor, which journeyed from Washington especially to confer with President Lewis before he departed for the Cleveland meeting.

At the meeting of the joint subcommittee held on March 23 it was agreed by the operators and miners that the men left to protect the mines during the suspension shall be paid at the present wage schedules, with the understanding that the terms of the new wage agreement shall be retroactive to April 1. It is estimated that about 3,000 men will be needed.

Farrington Arranges Meeting with Coal Producers to Discuss Wages

FRANK FARRINGTON, Illinois district president of the United Mine Workers, on Monday, March 27, arranged to meet Illinois operators on wage question in Chicago Wednesday, March 29. Both Farrington and the presidents of all three operators' associations said they believed nothing could be done except arrange a real wage session to be held after the strike takes effect. Farrington added he was confident a wage agreement could soon be made. Coal men think it will take 30 to 60 days.

There is a tendency in Chicago to hoot at the union headquarters idea of inducing non-union miners to strike in sympathy. The idea there prevails that not only will every non-union miner stay on the job but enough defections will occur in union ranks around the edges of the non-union fields so that a good many union mines will be able to start up early in the summer.

In Illinois it appears that plenty of men are ready to go to work in union mines if the operators need them. Men of all degrees, with mine experience and without it, are filing daily into the office of the Illinois Coal Operators' Association to list themselves for any jobs that may develop. They get no encouragement, the association telling them that there is almost no chance of their being called. Their names and addresses are taken, however. Members of the association met in Chicago Wednesday of last week behind closed doors to make arrangements, it was announced afterward, for protection and care of mine properties during the strike.

Indiana Operators Want Revisable Scale; Union Refuses to Meet Operators

THE scale committee of the Indiana Bituminous Coal Operators' Association met in Terre Haute March 21 for the purpose of formulating a wage scale and working agreement with the soft-coal miners of Indiana to take the place of the scale expiring March 31. It is understood the operators' scale when finished proposed that a reduction of from 30 to 40 per cent be made in wages to meet the reductions proposed by Eastern operators. Abolition of the check-off system and retention of the present time schedule also will be included in the scale. The operators will seek to include in the contract a clause making the wage scale provide for changes during the life of the contract whenever the operators in other states adopt a lower wage scale.

Mr. Penna, for the Indiana Bituminous Coal Operators' Association, despite a refusal to his first letter of March 18, made an offer to meet and confer with the Mine Workers officials in the Indiana bituminous district. In this second letter Mr. Penna referred to the violation of the contract by the miners in 1920 and the burden imposed by the long conferences by which contracts have hitherto been made. He reminded them that the differences which have prompted the call of the miners to strike April 1 do not involve a question of wages or recognition of the union by the operators, but merely insistence that the contract be made by such a portion of the coal-producing territory as the union believed would concede the best contract.

Miners Refuse to Confer with Operators

ALL efforts made by the bituminous coal operators in the fields comprising the Central Competitive region and in the outlying districts to confer with the United Mine Workers have failed. Among others the southern Ohio operators, who are in the aforementioned region, through W. D. Kinney, secretary of Southern Ohio Coal Exchange, offered to meet the Mine Workers' representatives of District No. 6, comprising Ohio, but were told on March 23 that no meeting could be held until after a basic wage agreement had been made for the whole region.

The Pittsburgh Coal Producers' Association, the biggest operators' organization in District No. 5, invited the representatives of that district to meet with them at a certain place and time on March 20. When the hour came the operators' representatives were present but the representatives of the Mine Workers did not put in an appearance.

In central Pennsylvania, which is outside the Central Competitive region, B. M. Clark of Indiana, Pa., president of the Association of Bituminous Operators of Central Pennsylvania, the larger of two operators' organizations in that area of the coal fields, requested John Brophy, president of District No. 2, to meet the operators for the purpose of making a wage scale, but has had no reply. He is resting on the declaration of the Indianapolis convention which prescribed that the outlying districts must wait till the Central Competitive region had made its scale before making theirs.

It is recalled in the *United Mine Workers Journal* that on March 9 the mine workers and operators of the Southwestern coal fields met at Kansas City, but parted without results because the mine workers refused to discuss a contract prior to the writing of a basic wage scale in the Central Competitive region.

Reference to the shifting policy of Mr. Keeney, president of the Fairmont-Kanawha mine workers, at Baltimore and elsewhere, is contained in the chronology of last week and in a special story in this week's issue. In another place will be found reference to the difficulties the Indiana and the Illinois operators are finding in obtaining a conference. In Nova Scotia the operators find that the mine workers will not accept the award of arbitrators or even a more favorable agreement made by their leaders in conference with the operators. In the anthracite region they are striking in the midst of a conference of their own seeking.

Anthracite Tax Will Total $3,150,799.85 For Second Half of 1921

ACCORDING to reports in the hands of Auditor General Lewis, the State of Pennsylvania is now entitled to $3,150,799.85 as its 1½ per cent tonnage tax on anthracite produced during the second half of 1921, provided the constitutionality of that act is upheld by the Supreme Court.

During the period July 1-Dec. 31, 1921, anthracite production, including dredge coal, as reported to the state, was 31,590,171.83 tons, having a computed value of $210,053,310.43. The reports are not complete, the Auditor General reporting that there are a few delinquents who are being rounded up.

The average sales prices during the period of the reports, as filed by eighteen representative operators, and on which assessments have been computed, were: Broken, $7.5355; egg, $7.551; stove, $7.822; chestnut, $7.7623; pea, $5.7414; buckwheat, $3.5413; rice, $2.1058; barley, $1.362.

Kanawha-Fairmont Men Meet but Refuse to Make Any Contract with Operators

FRESH from the biennial meeting of District No. 17 at Charleston, W. Va., held March 18, the scale committee of the United Mine Workers met the scale committee of the operators at Baltimore, March 25, and refused to make a contract, urging that it was without authority to take such action till the Central Competitive region had decided on its scale. Consequently the meeting came to an end without coming to an agreement.

Production Record Again Beaten

AS this issue went to press word was received that on Saturday, March 25, 1922, the Orient mine of the Chicago, Wilmington & Franklin Coal Co., at Orient, Ill., hoisted 8,210 tons. This exceeds the best record of the Bell & Zoller No. 1 mine, as noted in the last paragraph on page 541, by 927 tons. In making the record at the Orient mine the actual hoisting time was 12 minutes less than 8 hours, and a total of 1,640 dumps was made. The height of the hoist is 590 ft.

Now, who can beat this record of Orient mine?

Production and the Market

Weekly Review

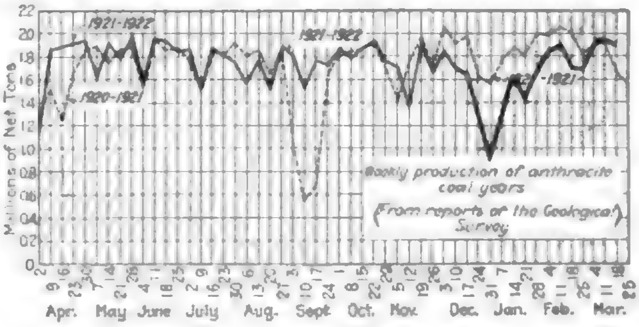
AS THE curtain goes up for the opening scene in the strike drama, the industrial coal buyer, having safeguarded his needs to the tune of about six weeks' supply, settles himself in the audience and assumes the role of spectator. The eve of the coal strike has been marked by a further softening of the market. Commercial consumers of coal have turned a deaf ear to the quotations made, while railroads and public utilities, which have been the most active takers, are going out of the market as their stocking programs are completed.

Heavy production in the face of this apathetic demand made lower prices inevitable. *Coal Age* Index of spot bituminous prices stands at 170 on March 27, as compared with 173 on March 20. Domestic demand has almost disappeared and only the diminishing output of the resultant sizes kept steam prices from slipping to lower levels in those sections of the country where bituminous coal is used for household purposes.

WHY INDUSTRIAL BUYER IS OUT OF THE MARKET

The industrial consumer had several motives for withdrawing, temporarily at least, from the market. Present consumption rates are so low that reserve stocks are almost topheavy; indications that an announcement of cuts in freight rates will soon be made and the persistent belief that non-union fields will be able to supply fuel needs above existing stocks are the main reasons. No one wants to be caught after the strike with stocks of coal on hand that cost more than its replacement value. That the non-union supply may be adequate is being shown by the increasing desire of those operators to take on forward commitments, and dull times are surely ahead for the coal man unless the present suspension is sufficiently prolonged to enable consumers to work off the reserve supplies now in hand.

Production in the anthracite branch of the industry, however, has been maintained by the appearance of eleventh-hour business. Producers have even been able to move the less-favored family sizes, but prices have not been greatly strengthened, as the tonnage offered has been sufficiently heavy to meet the demand. At the present rate of domestic buying, retail stocks will last well into May. Steam coals are not active, with the exception of barley. Lake business has not yet appeared; only two boats have been filled at Buffalo, whereas normally at this time many thousands of tons would have been loaded in anticipation of the opening of navigation.

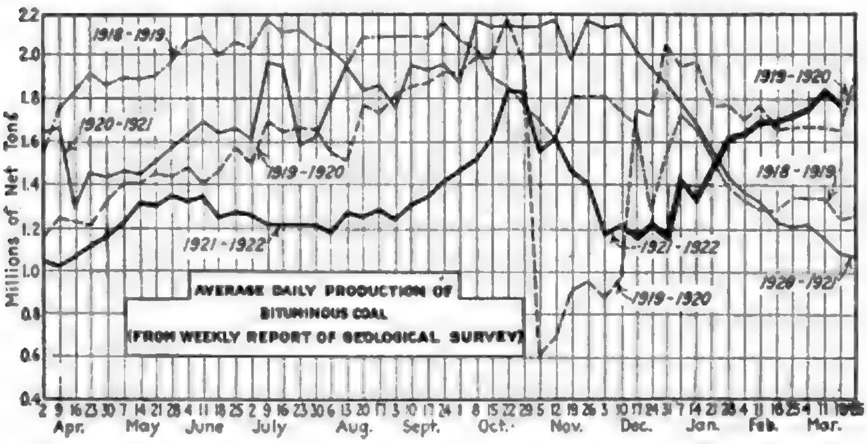


The beehive coke market is decidedly softer, but so far the demand has absorbed the tonnage without any lowering of spot prices.

BITUMINOUS

Production of bituminous coal was 10,784,000 net tons during the week ended March 18, a decrease of 331,000 tons when compared with the preceding week. Early reports of loadings for last week indicate a recovery in the rate of output. In spite of the decrease, production so far exceeded consumption that nearly 2,500,000 tons were added to consumers' stock piles.

A canvass of bituminous coal stocks made by the Geological Survey shows that on March 1 there were approx-



Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1921-1922	1920-1921
March 4 (b)	10,541,000	7,278,000
March 11 (b)	11,115,000	6,900,000
March 18 (a)	10,784,000	6,512,000
Daily average	1,797,000	1,020,000
Coal year	413,876,000	510,051,000
Daily av. coal yr.	1,400,000	1,719,000

ANTHRACITE

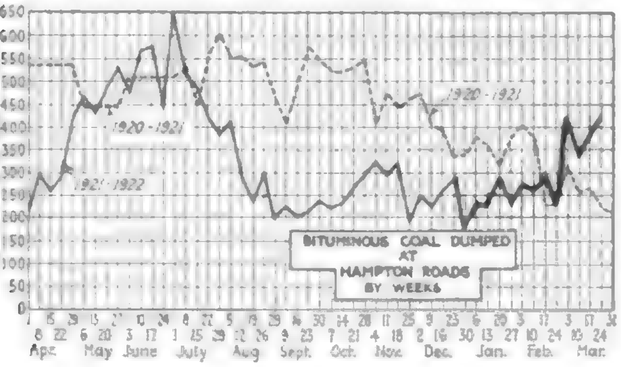
	1921-1922	1920-1921
March 11	1,982,000	1,925,000
March 18 (a)	1,907,000	1,687,000
Coal year	83,168,000	87,158,000

COKE

	1922	1921
March 11	154,000	162,000
March 18	149,000	118,000
Calendar year	1,443,000	2,375,000

(a) Subject to revision. (b) Revised from last report.

imately 52,500,000 tons in storage, as compared with 47,500,000 tons on Jan. 1. It is estimated that with the coal now in transit stocks will be around 63,000,000 tons on April 1, equal to the amount in hand when the armistice was signed, but representing a longer period of supply because of the lower rate of present requirements.



All-rail movement to New England was 4,064 cars during the week ended March 18, an increase of 370 cars over the preceding week. The increase was due to shippers pushing tonnage on expiring contracts, rather than to any increase in demand. Pennsylvania operators are almost out of the running, due to competition from Hampton Roads. Contract offers fail to interest buyers at the present time. Some of these offers are based on the 1917 wage scale, and this apparently is the program where operators are free from the union.

Hampton Roads dumpings for all accounts totaled 422,420 net tons during the week ended March 23, as compared with 377,307 tons in the preceding week. Coastwise markets took the larger part of this tonnage, although New England is surfeited with coal. Tonnage at the Roads is not accumulating, which is attributed to operators shipping heavily to Western points in anticipation of the strike. Low-priced coal at the Roads has brought a cargo to Baltimore for the first time except for one emergency shipment during the war. Coastwise freights have a softening tendency because of the lack of inquiry. The spread of the New England textile strike is a further unfavorable market factor.

Mild weather has lowered the call from householders and the domestic market is very stagnant. This, coupled with the heavy shipments of steam coals, has cluttered the yards with domestic "no-bills." A number of operators have loaded and held every available car lately, so that April 1 will see a considerable tonnage on wheels, which will be

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

	Market Quoted	Feb 27, 1922	Mar 13, 1922	Mar 20, 1922	Mar. 27, 1922†
Low-Volatile, Eastern					
Pocahontas lump	Columbus	$3.25	$3.15	$3.05	*$2.60@$2.90*
Pocahontas mine run	Columbus	2.15	1.85	1.85	*1.65@1.90*
Pocahontas screenings	Columbus	1.40	1.45	1.15	**1.15@1.30**
Pocahontas lump	Chicago	3.15	3.15	3.15	*2.50@2.90*
Pocahontas mine run	Chicago	2.15	1.85	1.85	*1.25@1.50*
Pocahontas lump	Cincinnati	3.15	3.15	2.85	*2.60@3.00*
Pocahontas mine run	Cincinnati	1.75	1.75	1.70	1.65@1.75
Pocahontas screenings	Cincinnati	1.15	1.15	1.15	1.00@1.25
*Smokeless mine run	Boston	4.60	4.60	4.55	4.50@4.65
Clearfield mine run	Boston	1.95	1.95	1.95	1.65@2.25
Cambria mine run	Boston	2.45	2.45	2.45	2.25@2.60
Somerset mine run	Boston	1.90	1.90	1.90	1.75@2.00
Pool 1 (Navy Standard)	New York	3.00	2.95	2.85	2.75@3.00
Pool 1 (Navy Standard)	Philadelphia	3.05	3.05	3.00	*2.65@3.00*
Pool 1 (Navy Standard)	Baltimore	2.70	2.65	2.65	2.60@2.70
Pool 9 (Super Low Vol.)	New York	2.40	2.40	2.30	*2.10@2.[illegible]*
Pool 9 (Super Low Vol.)	Philadelphia	2.45	2.45	2.35	*1.90@2.15*
Pool 9 (Super Low Vol.)	Baltimore	2.40	2.15	2.15	**2.20@2.30**
Pool 10 (H. Gr. Low Vol.)	New York	2.00	2.00	1.90	**2.00@2.20**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.10	2.10	2.10	*1.75@2.10*
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.10	2.10	2.10	**2.15**
Pool 11 (Low Vol.)	New York	1.75	1.70	1.70	**1.80@2.00**
Pool 11 (Low Vol.)	Philadelphia	1.75	1.75	1.75	*1.60@1.80*
Pool 11 (Low Vol.)	Baltimore	1.85	2.05	2.05	2.00@2.10
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.50	1.60	1.40	**1.50@1.60**
Pool 54-64 (Gas and St.)	Philadelphia	1.50	1.50	1.50	*1.30@1.[illegible]*
Pool 54-64 (Gas and St.)	Baltimore	1.40	1.55	1.55	1.55
Pittsburgh sc'd. Gas	Pittsburgh	2.65	2.70	2.65	2.60@2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.15	2.00	*1.80@1.90*
Pittsburgh slack (Gas)	Pittsburgh	1.65	1.65	1.55	1.50@1.60
Kanawha lump	Columbus	2.55	2.50	2.30	2.25@2.35
Kanawha mine run	Columbus	1.60	1.60	1.50	1.40@1.65
Kanawha screenings	Columbus	1.40	1.40	1.45	*1.25@1.30*
W. Va. Splint lump	Cincinnati	2.25	2.50	2.15	2.00@2.25
W. Va. Gas lump	Cincinnati	1.85	2.15	1.85	**1.90@2.00**
W. Va. mine run	Cincinnati	1.40	1.35	1.40	*1.25@1.30*
W. Va. screenings	Cincinnati	1.30	1.30	1.30	1.25@1.35
Hocking lump	Columbus	2.55	2.60	2.60	*2.50@2.70*
Hocking mine run	Columbus	1.90	1.90	1.75	1.65@1.90

	Market Quoted	Feb. 27, 1922	Mar. 13, 1922	Mar. 20, 1922	Mar 27 1922†
Hocking screenings	Columbus	$1.50	$1.50	$1.55	*$1.35@$1.55*
Pitts. No. 8 lump	Cleveland	3.10	3.05	2.90	*2.75@2.90*
Pitts. No. 8 mine run	Cleveland	2.00	1.90	1.90	*1.80@1.90*
Pitts. No. 8 screenings	Cleveland	1.80	1.75	1.70	1.65@1.75
Midwest					
Franklin, Ill. lump	Chicago	3.25	3.45	3.40	*3.00@3.50*
Franklin, Ill. mine run	Chicago	2.50	2.50	2.50	*2.00@2.50*
Franklin, Ill., screenings	Chicago	2.00	1.85	1.95	**1.85@2.15**
Central, Ill., lump	Chicago	3.00	2.80	2.80	*2.50@2.75*
Central, Ill. mine run	Chicago	2.35	2.35	2.35	*2.10@2.30*
Central, Ill., screenings	Chicago	1.80	1.75	1.75	**1.75@2.00**
Ind. 4th Vein lump	Chicago	3.25	3.25	3.15	3.00@3.25
Ind. 4th Vein mine run	Chicago	2.50	2.40	2.45	*2.25@2.50*
Ind. 4th Vein screenings	Chicago	2.00	2.15	2.00	**2.00@2.25**
Ind. 5th Vein lump	Chicago	2.90	2.80	2.80	**2.65@3.00**
Ind. 5th Vein mine run	Chicago	2.25	2.35	2.20	2.10@2.35
Ind. 5th Vein screenings	Chicago	1.75	1.60	1.60	**1.65@1.90**
Standard lump	St. Louis	2.60	2.60	2.55	*2.30@2.50*
Standard mine run	St. Louis	1.95	1.85	1.80	**1.80@1.90**
Standard screenings	St. Louis	1.10	1.20	1.10	**1.25@1.40**
West. Ky. lump	Louisville	2.65	2.45	2.35	2.25@2.50
West. Ky. mine run	Louisville	1.85	1.85	1.75	1.65@1.90
West. Ky. screenings	Louisville	1.80	1.65	1.45	**1.40@1.75**
South and Southwest					
Big Seam lump	Birmingham	2.60	2.60	2.60	*2.00@2.25*
Big Seam mine run	Birmingham	1.85	1.85	1.85	1.70@2.00
Big Seam (washed)	Birmingham	1.85	1.85	1.85	1.75@2.00
S. E. Ky. lump	Louisville	2.55	2.35	2.10	2.00@2.25
S. E. Ky. mine run	Louisville	1.55	1.50	1.60	*1.50@1.60*
S. E. Ky. screenings	Louisville	1.35	1.35	1.30	**1.30@1.50**
S. E. Ky. lump	Cincinnati	2.35	2.25	2.10	2.00@2.25
S. E. Ky. mine run	Cincinnati	1.75	1.35	1.45	*1.25@1.35*
S. E. Ky. screenings	Cincinnati	1.15	1.30	1.25	1.15@1.35
Kansas lump	Kansas City	5.00	5.00	5.00	*4.00@5.00*
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

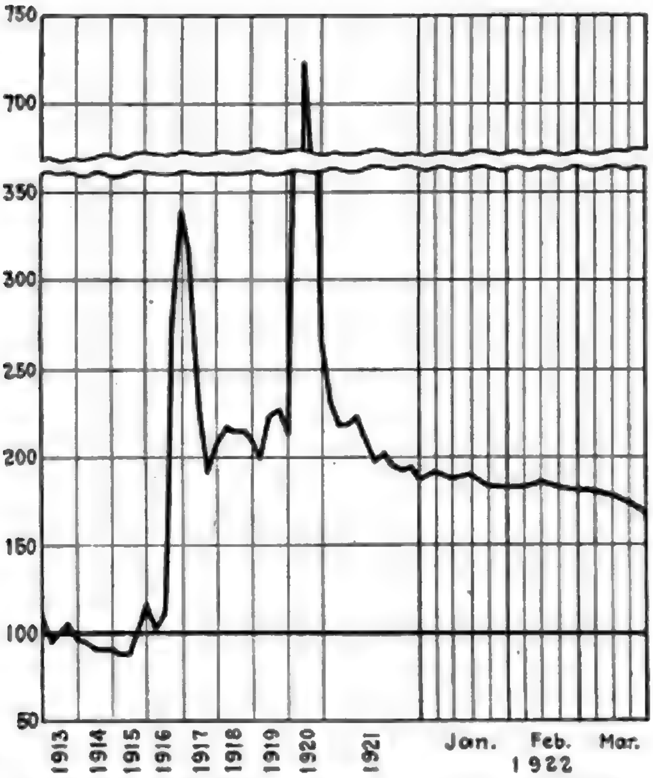
*Gross tons, f.o.b. vessel, Hampton Roads.

†Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	March 13, 1922 Independent	March 13, 1922 Company	March 20, 1922 Independent	March 20, 1922 Company	March 27, 1922† Independent	March 27, 1922† Company
Broken	New York	$2.61		$7.60@$7.75		$7.60@$7.75		$7.60@$7.75
Broken	Philadelphia	2.66	$7.00@$7.50	7.75@7.85	$7.00@$7.50	7.75@7.85	$7.00@$7.50	7.75@7.85
Egg	New York	2.61	7.35@7.75	7.60@7.75	7.35@7.75	7.60@7.75	**7.60@7.75**	7.60@7.75
Egg	Philadelphia	2.66	7.15@7.75	7.75	7.15@7.75	7.75	**7.25@7.75**	7.75
Egg	Chicago	5.63	*7.50	*6.90@7.40	*7.50	*6.90@7.40	*7.50	***6.95@7.40**
Stove	New York	2.61	7.85@8.10	7.90@8.10	7.75@8.00	7.90@8.10	**7.90@8.10**	7.90@8.10
Stove	Philadelphia	2.66	7.75@8.15	8.05@8.25	7.85@8.15	8.05@8.25	7.85@8.15	8.05@8.25
Stove	Chicago	5.63	*7.75	*7.20@7.60	*7.75	*7.20@7.60	*7.75	*7.20@7.60
Chestnut	New York	2.61	7.90@8.10	7.90@8.10	7.85@8.00	7.90@8.10	**7.90@8.10**	7.90@8.10
Chestnut	Philadelphia	2.66	7.75@8.15	8.05@8.25	7.75@8.15	8.05@8.25	**7.85@8.15**	8.05@8.25
Chestnut	Chicago	5.63	*7.75	*7.20@7.60	*7.75	*7.20@7.60	*7.75	*7.20@7.60
Pea	New York	2.47	4.50@5.00	5.75@6.45	4.75@5.10	5.75@6.45	**5.00@5.50**	5.75@6.45
Pea	Philadelphia	2.38	4.75@5.00	6.15@6.25	4.75@5.00	6.15@6.25	**5.50@6.00**	6.15@6.25
Pea	Chicago	5.63	*6.00	*5.60@6.10	*6.00	*5.60@6.10	*6.10	*5.60@6.10
Buckwheat No. 1	New York	2.47	3.00@3.50	3.50	2.75@3.50	3.50	2.75@3.50	3.50
Buckwheat No. 1	Philadelphia	2.38	2.75@3.25	3.50	2.75@3.25	3.50	2.75@3.25	3.50
Rice	New York	2.47	2.00@2.60	2.50	2.00@2.60	2.50	*2.00@2.50*	2.50
Rice	Philadelphia	2.38	2.00@2.50	2.50	2.00@2.50	2.50	2.00@2.50	2.50
Barley	New York	2.47	1.50@1.75	1.50	1.50@1.75	1.50	**1.50@1.85**	1.50
Barley	Philadelphia	2.38	1.50@1.75	1.50	1.50@1.75	1.50	1.50@1.75	1.50
Birdseye	New York	2.47	1.65@1.75	2.00@2.50	1.65@1.75	2.00@2.50		2.00@2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index 170, Week of March 27, 1922. Average spot price for same period, $2.05. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report of "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

an added strike safeguard. Loads are piling up in the Cincinnati Gateway section and are the heaviest of the year at the Russell (Ky.) yards.

ANTHRACITE

Production of hard coal was maintained during the week ended March 18. The output was 1,907,000 net tons, only 75,000 tons less than in the previous week. Last-minute orders provided full bookings for the producers and caused a check to the declining independent prices.

Retailers who have not already done so are filling their yards with stocks sufficient, at the present rate of distribution, to last well into May. The householder is not buying for storage, but is confining his orders to present needs, as the possibility of lower mine prices and freight rates after the strike offers no inducements to take in more fuel than is needed to eke out the season. Steam coals are moving well, with barley the most active size. Lake business is being delayed by the heavy tonnage that will be carried over at the upper docks. All-rail movement to New England was 3,692 cars in the week ended March 18, as compared with 4,326 cars in the previous week.

COKE

Production of beehive coke dropped off 5,000 tons during the week ended March 18. The total output was 149,000 net tons. The market turned quiet recently but absorbed the tonnage at no lower prices than those lately quoted. There is little interest in second quarter contracts and indications are that needs for that period will be largely taken from the open market. The coal market is so soft that more operators have announced their intention to relight ovens, and this may cause production again to outstrip demand.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Mar. 11, 1922 Inclusive	Week Ended Mar. 11
U. S. Total	45.6	54.2	61.8
Non-Union			
Alabama	63.5	61.7	67.0
Somerset County	55.5	75.0	80.7
Panhandle, W. Va	55.3	49.0	58.6
Westmoreland	54.9	56.8	50.7
Virginia	54.8	58.0	68.6
Harlan	53.3	53.5	60.2
Hazard	51.7	61.7	62.0
Pocahontas	49.8	59.7	65.9
Tug River	48.1	62.6	74.2
Logan	47.6	60.6	69.3
Cumberland-Piedmont	46.6	48.7	54.9
Winding Gulf	45.7	63.0	73.3
Kenova-Thacker	38.2	53.2	63.4
N. E. Kentucky	32.9	45.3	55.1
New River‡	24.3	29.8	35.3
Union			
Oklahoma	63.9	60.1	65.2
Iowa	57.4	77.3	90.6
Ohio, north and central	52.6	45.5	51.8
Missouri	50.7	64.9	78.2
Illinois	44.8	52.9	59.6
Kansas	42.0	52.0	65.2
Indiana	41.4	52.2	55.3
Pittsburgh†	41.2	38.1	48.5
Central Pennsylvania	39.1	48.4	55.3
Fairmont	35.3	46.4	40.3
Western Kentucky	32.5	35.7	42.3
Pittsburgh*	30.4	29.2	36.4
Kanawha	26.0	13.9	15.7
Ohio, southern	22.9	24.6	26.1

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

ITALY—The price of Cardiff steam first is quoted at 41s. 9d., according to a cable to *Coal Age*. Last week's price was 42s. 3d.

BRAZIL — Coal imports at Rio de Janerio during 1921, amounted to 657,727 metric tons, as compared with 870,681 tons in 1920 and 696,705 tons during 1919. Great Britain supplied 200,779 tons and the United States 465,032 tons during the last year.

GERMANY—Production of coal in the Ruhr region for the week ended March 11 was 1,927,000 metric tons, according to a cable to *Coal Age*, as compared with 1,838,000 tons in the week preceding.

A German iron works has been purchasing fuel from a Chilean company of Lebu for experimenting in Germany to determine whether Chilean coal is fitted for coking purposes.

NEW SOUTH WALES—Production in 1921 exceeded 10,000,000 tons, which is a record. Sectional disputes continue to hamper operations, but the miners have overwhelmingly rejected a proposal to work a nine day fortnight.

BELGIUM—The situation on the Belgian coal market is unchanged. Demand continues to weaken while, at the same time, British imports increase. The arrested re-lighting of furnaces in the metallurgical industries has brought about a certain weakness in coke, the demand for which is less sustained.

Foreign Coal in San Francisco

Shipments from Wales, England, and Australia are reaching the port of San Francisco with fair regularity. The coal is of a grade comparable with the best Utah coals. During 1921, a total of 76,000 tons of coal and 1,300 tons of coke was received from foreign sources. This coal was imported from England, China, Australia, Japan and France. The total valuation was somewhat less than $500,000. Local demand for coal is now approximately 8,000 to 10,000 tons per month.

The movement of foreign coal is expected to continue as long as ocean freight rates are as low as they are and the railroad rates are prohibitively high.

Canada Inquires for British Coals to Bridge American Strike; Export Prices Firm

BRITISH coal production declined slightly during the week ended March 11. The output was 4,996,000 gross tons, according to a cable to *Coal Age* as compared with 5,039,000 tons during the first week in March. Inquiries are circulating among the trade from Canadian sources, due to the anticipated stoppage of American coal during the strike. Montreal is asking for figures on 36,000 tons of Welsh coal, delivery over six months.

During February coal worth £4,446-225 was exported from Britain, compared with February of last year this is an increase of £205,605, and a decrease of £5,247,487 from February, 1920.

The last few days have seen an increase in the time worked at the pits. In Northumberland nearly all collieries are now on full time, while the employment conditions in Durham have very much improved. Among recent orders reported are 35,000 tons of best steam coals for the Norwegian railways, and for other buyers, 10,000 best Durham bunkers, 27,000 tons gas seconds, and 20,000 tons best steams.

Scotland is getting ready for the anticipated demands from the north of Europe when the Baltic opens up. Other contracts accruing to Scotland are from France, Italy, the western Mediterranean and South America.

While the export trade throughout Britain seems definitely to be on the turn, the stoppage in the shipbuilding and engineering industries has served to delay further the recovery which was just becoming apparent.

The net production costs in the third quarter of 1921 were £58,372,968 or 26s. 9d. per ton on the output of 48,-687,243 tons, according to the *Colliery Guardian*. Proceeds for the same period were £63,420,471 or 29s. .76d. per ton, a profit of £5,047,503. During the preceding quarter when the strike was in full blast, only 1,555,757 tons were produced at the enormous loss of £10,-413,650. Assuming that 50,000,000 tons is a normal output for a three-months' period the industry lost approximately $1 per ton during the period of enforced idleness.

February Exports Increased Slightly

There was a slight increase in exports of bituminous coal in February, as compared with January, but the volume of business continues to be almost negligible when the exports to Canada are excluded. The detailed figures, which are those of the Bureau of Foreign and Domestic Commerce are as follows:

FEBRUARY EXPORTS AND IMPORTS
(Gross Tons)

	Feb. 1921	Feb. 1922
Exports, bituminous coal:		
By rail to		
Canada	628,860	660,796
Mexico	25,807	5,254
Total	654,667	666,050
By vessel to		
West Indies	14,162	13,431
Panama	47,469	
Cuba	42,213	50,101
Total	103,844	63,532
France	54,132	3,785
Italy	104,693	7,414
Netherlands	38,555	2,537
Norway	757	......
Sweden	9,521	......
Denmark	28,040	......
Total Europe	235,698	13,736
Argentina	50,838	4,054
Brazil	42,208	16,920
Chile	39,667	6,889
Uruguay	6,676	...
Total South America	139,389	27,863
Egypt	50,439	21,401
Other countries	74,639	21,005
Total bituminous*	1,258,676	813,587
Total anthracite	291,950	274,905
Total coke	27,238	31,534

*Does not include fuel or bunker coal laden on vessels engaged in the foreign trade which was for February, 1921, 577,315 tons, for February, 1922, 358,544 tons.

	Feb. 1921	Feb. 1922
Imports, bituminous coal:		
Imported from:		
United Kingdom	...	6,291
Canada	54,279	75,652
Japan	...	881
Australia	1,954	10,195
Other countries	25	...
Total bituminous	56,258	93,019
Total anthracite	32	9,154
Total coke	1,840	5,074

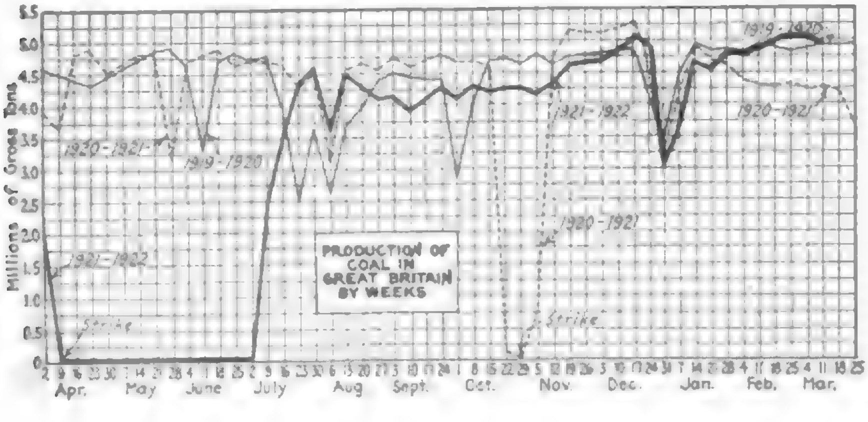
Hampton Roads Dumps Large Tonnage

Hampton Roads has been preparing for the strike by breaking all dumping records for the past six months. During the first three weeks of March more than 1,000,000 tons went over the piers.

The Bethlehem Steel Co. was carrying coal at the rate of 10,000 tons every ten days to its Sparrow's Point plant, dealers in touch assigning the forthcoming strike as the reason.

Every preparation is being made for an unusually large non-union output. Dealers were hearing reports that British operators are preparing to enter the American field, and to ship large quantities of Welsh coal.

While the Norfolk & Western and the Virginian railways do not tap the union coal fields, the territory served by the Chesapeake & Ohio, with terminals at Newport News is largely unionized. For this reason dealers were of the opinion the two Norfolk piers will witness a largely increased activity, while the Newport News piers will suffer.



Hampton Roads Pier Situation

	Week Ended March 16.	Week Ended March 23.
N. & W. Piers, Lamberts Point:		
Cars on hand	1,598	1,407
Tons on hand	89,810	73,257
Tons dumped	158,087	158,488
Tonnage waiting	18,000	8,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,690	1,733
Tons on hand	84,500	86,650
Tons dumped	93,418	135,631
Tonnage waiting	15,000	11,412
C. & O. Piers, Newport News:		
Cars on hand	1,234	1,218
Tons on hand	61,700	60,940
Tons dumped	85,377	83,042
Tonnage waiting	1,100	2,985

Export Clearances, Week Ended March 23, 1922

FROM HAMPTON ROADS:

	Tons.
For Atlantic Islands:	
Nor. S.S. Tune, for Curacao	2,656
Br. S.S. Bethlehem, for Fort de France	2,847
Nor. S.S. Commodore Rollins, for Port Antonio	522
For Brazil:	
Am. S.S. Robin Gray, for Rio de Janeiro	8,572
Br. S.S. Dundrennan, for Rio de Janeiro	3,500
For Canada:	
Nor. S.S. Erholm, for St. Johns, N. B.	1,735
For Cuba:	
Am. Schr. John R. Fox, for Cienfuegos	1,159
Nor. S.S. Thorsdal, for Havana	3,354
FROM PHILADELPHIA:	
For Cuba:	
Nor. S.S. Munorway, for Havana	—
For Canada:	
Br. Schr. Flowerdew, for St. Johns	—

Pier and Bunker Prices, Gross Tons

	March 18	March 25†
PIERS		
Pool 9, New York	$5.45@$5.75	*$5.35@$5.65*
Pool 10, New York	5.15@5.40	*5.10@5.35*
Pool 9, Philadelphia	5.50@5.85	*5.40@5.70*
Pool 10, Philadelphia	5.20@5.60	*5.00@5.35*
Pool 71, Philadelphia	5.70@6.00	*5.55@5.80*
Pool 1, Hamp. Rds	4.50@4.65	4.50@4.65
Pools 5-6-7 Hamp. Rds	4.30	4.30
Pool 2, Hamp. Rds	4.55	4.55
BUNKERS		
Pool 9, New York	$5.75@$6.05	**$5.75@$6.10**
Pool 10, New York	5.45@5.75	*5.45@5.70*
Pool 9, Philadelphia	5.85@6.10	*5.60@5.85*
Pool 10, Philadelphia	5.50@5.85	*5.25@5.60*
Pool 1, Hamp. Rds	4.80	4.80
Pool 2, Hamp. Rds	4.70	4.70
Welsh, Gibraltar	40s. 6d. f.o.b.	40s. 6d. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	42s. t.i.b.	42s. t.i.b.
Welsh, Messina	38s. t.i.b.	38s. t.i.b.
Welsh, Algiers	37s. f.o.b.	37s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	38s. f.a.s.	38s. f.a.s.
Welsh, Teneriffe	38s. f.a.s.	38s. f.a.s.
Welsh, Malta	42s. f.o.b.	42s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Belgium, Antwerp	30s.	30s.
Alexandria	47s.	47s.
Bombay	38 rupees	38 rupees
Capetown	39s.	39s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

	March 18	March 25†
Cardiff:		
Admiralty, Large	27s.@27s. 6d.	27s.@27s. 6d.
Steam, Smalls	19s.@20s.	19s.@20s.
Newcastle:		
Best Steams	25s.	25s. 6d.
Best Gas	24s.@25s.	24s.@25s.
Best Bunkers	23s. 6d.@24s.	*22s. 6d.@23s.*

†Advances over previous week shown in **heavy type**; declines in *italics*.

North Atlantic

Market Softens, Causing Many Mines to Close

Thirty Operations Suspend in Monongahela District—No Apprehension of Shortage Felt—Stocks Heavy and Non-Union Coal Easy to Obtain

THE market has softened to such an extent that many mines have been closed, the greatest curtailment being in the Monongahela district, where 30 operations ceased last week. No apprehension of a shortage is being shown. The volume of stocks and the ease with which non-union coal can be obtained have rendered the buyer indifferent to the market.

Shippers are anxious to contract but the consumer desires to work off his large reserve before entering into new agreements. The New York harbor is well supplied with loaded boats, while receipts have been much lower in the past week. A predicted anthracite shortage is causing some Philadelphia dealers to make inquiries for a bituminous substitute.

NEW YORK

Prospects of a shortage after April 1 failed to create any activity here last week. If anything, the situation was a trifle quieter.

Less coal is being sent forward. Consumers are well prepared for some time ahead and this accounts for the apparent indifference manifested at this time.

Contract coal is moving in good force and in some instances additional tonnage is being taken. Public utilities are well fixed. They feel they will be able to meet any emergency that may arise.

The approach of the conflict has not prevented producers of some non-union mines from quoting contract prices which range \$2@\$2.50 according to grade and subject to wage adjustments. Already there are those who are wondering whether English coals will be brought here should the strike continue for any length of time.

Empty boats are hard to pick up. The demand has created a shortage and rates have advanced rapidly. Harbor delivery boat rates are about 45c. and for boats from 600 tons upward rates are about \$12 per day.

CENTRAL PENNSYLVANIA

Monthly production up to March 17 was 45,172 cars, as compared with 41,829 cars to the same date in February. This is the largest production rate for a year.

This field is only partially unionized. Cambria County is largely union, the chief exceptions being the mines in the vicinity of Johnstown and the Weaver and Coleman operations at Colver and Revloc. The miners of the Pennsylvania Coal & Coke Co., the Altoona Coal & Coke Co., and the Russett Coal Co., are organized. Less than half the mines in Somerset County are unionized, the principal exceptions being the Berwind-White Co., at Windber. Clearfield and Indiana operations are largely unionized.

UPPER POTOMAC

Little or no improvement is discernible. Production is extremly limited, owing to the poor demand and many dead loads have accumulated between Thomas and Piedmont. Some companies are getting out a little railroad fuel but that is all. Prices are so low it is impossible to operate. Where union miners have attempted to prevent other men from going to work, companies have shut down to avoid trouble. With the small demand existing and prices on so low a level most producers are refraining from attempting to operate at all.

BALTIMORE

There is very little local demand and prices are hanging about the same as for some weeks past, even before the strike threat became acute.

Shipment here for the first time, except for one war-time emergency, of soft coal from Hampton Roads, has been recorded. The low price of coal at Tide at Hampton Roads led to the shipment of one large cargo to the Bethlehem Steel Co. at Sparrows Point. The export situation is again improving after one of the most remarkable flat periods in the history of the trade. For the eleven days from March 11 to 21 five vessels cleared with export coal cargoes, a total of more than 21,000 tons cargo, and 1,100 tons bunker. The distribution was wide, including one vessel each to Argentine, Cuba, Egypt, Porto Rico and Italy.

PHILADELPHIA

Most of the concerns which had recently ordered excess stock had their orders about filled last week and this left an excess of tonnage to be absorbed by the market. The softening was followed by a drop in spot prices from 15c. to 25c. and occasionally as much as 35c. has been cut from prices of the preceding week.

This has made shippers more anxious to place coal on a contract basis, yet with so much stock ahead the big consumer is now inclined to stand firm and use up much of the accumulation. Some consumers are outspoken in believing that they will yet get good coal from the best shippers on a basis of \$2 contract before the end of the summer.

The only other new feature in the trade has been a number of inquiries from retailers not accustomed to handle bituminous. There seems to be some inclination in that direction to take in a little coal to meet the demands of small manufacturing plants. In addition the retailers are no doubt looking forward to the possibility of selling some bituminous coal for domestic consumption when their anthracite stocks become exhausted.

FAIRMONT

Thirty mines in the Monogahela district were closed last Saturday. Operators said that while they have been pushed to capacity to fill demands during the last few weeks, in anticipation of a coal strike, their contracts have been filled. Suspension in the Scott's Run field is now almost complete.

West

KANSAS CITY

Operators have been holding meetings and planning for action April 1, or rather inaction. Of course, the strike is the subject of discussion all around. A great deal depends on what the railroad-owned mines will do when the pinch for coal is reached. It will be recalled that in the strike of 1910 the railroad mines broke away and made settlement with the miners and this has generally been the case in all prolonged strikes.

Some operators in the past have also made independent settlements with their men and these same operators, or at least some of them, are still in business, and may not have the nerve to hold out until a settlement fair to the public generally can be made.

Steam grades are scarce and the demand exceeds the supply, but prices are unchanged. Kansas lump is plentiful.

DENVER

The Colorado Fuel & Iron Co. has denied a proposed wage cut, April 1, rumors of which were circulated during the recent convention of delegates of District 15, U. M. W., in Denver. The company, as the largest operator, does not recognize the union, and this is believed to be responsible for the circulation of reports to influence company miners in the contemplated walkout April 1.

The meetings of the miners' international union in Indianapolis have a representation of four delegates of District 15, who have been instructed to stand with the national committee for a suspension of work. The fact that a 30-per cent cut in wages has already been made effective gives rise to speculation as to how successful the strike will become in Colorado.

Production, in the meantime, is somewhat below normal, and no special preparations are being taken by retailers to fill their yards. Prices are unchanged, the only temporary underselling being in the lignite fields.

SALT LAKE CITY

Owing to the impending strike business is holding up. Stocks in the city are low. If the strike does come things may prove serious, for dealers are not buying much coal in view of the prospect of price reductions. Railroads are reported to have supplies on hand that will last from 60 to 90 days.

February production reached 402,492 tons. Last year it was 322,688 tons, while in 1920 it totaled 515,214 tons. The January figure was 421,631 tons. These data are from Chief Inspector of Mines, C. A. Allen.

Anthracite

Some Last-Minute Business Keeps Production Going

Demand Is Insufficient to Affect Independent Prices Markedly—Retailers' Stocks Will Carry Into May—Steam Coals Active—Only Two Lake Cargoes Loaded

ANTHRACITE production has been maintained by the appearance of last-minute business before the date set for the suspension of mining. Independent prices fail to show much stimulation, however, as the demand has not been heavy enough to tax the tonnage available.

Most retailers have sufficient stocks to carry them into the month of May, or longer if the householder continues his present state of indifference to the strike. Retail business is only on a hand-to-mouth basis. Steam coals are moving well, with barley the most active. Only two Lake cargoes have been loaded so far this season in anticipation of the opening of navigation, where normally this tonnage would amount to several thousand tons.

NEW YORK

All producers report increased orders and more than one independent operator stopped taking new business last week, as they had already booked sufficient shipments to take them up to April 1. The companies had no difficulty to keep their stocks moving and in the last week received many new orders, some from dealers who neglected earlier in the month to fill their yards.

Buyers were not willing to pay premiums for independent coals with the result that sales were made at company circular. Occasionally offers of certain domestic coals already in boats were heard at prices below company schedules. There are many loaded boats in the harbor containing all sizes most of which is probably being held to await a more favorable market.

With the suspension in force and the prospects of more coal coming forward doubtful, there is bound to result more or less competition for available tonnage.

The steam sizes were easy, the greatest activity being noticed in barley which for the best grades, was bringing a premium.

BALTIMORE

Hard coal sales here are very light, the springlike weather having brought an end to a brief spurt in seasonal small buying. The people are apparently not worrying over a strike threat, feeling sure that they will get their coal later in the year. Representatives of the Baltimore Coal Exchange appeared before the House judiciary committee of the Maryland legislature in the past week to urge the passage of a bill which will establish the net ton in Maryland as the standard instead of the gross ton. The bill is being warmly contested on both sides.

BOSTON

There is no marked change in the local situation. Sources of supply tightened up materially the past few days and there were relatively few shippers who were in position to furnish coal for the last days of the month.

The retail trade here is disposed to rest on present reserves, which roughly are on about a 90-day basis. There are a few far-sighted buyers who are taking on stove and chestnut in heavier proportion than usual, their idea being that these will probably be the short sizes when mining is resumed. Householders are buying only from hand to mouth.

PHILADELPHIA

Demand from all quarters grew quite strong last week. Some retailers who were inclined to carry light stocks woke up and tried to hurry in shipments of prepared sizes. Some of the independents early in the week flatly declined to take any more business as they already had as much on their books as they hoped to fill.

Retailers feel that many a buyer in ordering two or three tons lately was really putting aside a ton in case of emergency. During the past week also the dealers received an increasing number of orders from their best trade asking that their entire next winter's supply be delivered at once.

The quickening of the demand can be best understood when it is said that many shippers even refused to take more orders for pea coal, a size which has been simply dragging along since last fall.

The condition of the steam sizes continues good, but buckwheat does not strengthen, and yet can be said to be in active demand. Rice is not yet quite up to normal, but barley is being moved as fast as produced. There is still much independent buckwheat to be had at $3 and rice at $2, but all seem able to get $1.50 for barley.

ANTHRACITE FIELDS

Production is on the increase and every mine has been working to capacity. The only dull point is at one of the Pennsylvania Coal Co.'s mines, the Old Forge Colliery, where the men are out on a strike. The river washeries to some extent have resumed operations and this tends to increase the output.

BUFFALO

Buying is chiefly for the early needs of dealers. Most of them have already prepared for furnishing what their customers are likely to require during the remainder of the winter. Stocks are undoubtedly large and the outlook is for rather light consuming demand in the next few weeks.

Two coal cargoes will be loaded here within the next few days, but the expected activity has not developed. It has been customary in previous years to have many thousand tons loaded in anticipation of the opening of navigation, but this year will in all probability be different. Upper-lake buyers will probably hold off to await the developments of the strike situation.

Coke

BUFFALO

Firm prices are shown in the coke market, with the demand on a small basis. Production has been much curtailed, and this is indicated by the slowness with which deliveries are made. Prices are $4.50@$4.75 for Connellsville foundry, $3.25@$3.50 for furnace and about $3 for some of the domestic sizes, to which add $3.64 for freight.

CONNELLSVILLE

The spot furnace coke market has turned decidedly quieter in the past week, but not until fairly heavy buying had absorbed all coke offered at under $3.50, leaving the market now firm at that figure. Sales previously made have taken care of all production and no coke has been forced on the market. Between 400 and 500 ovens are scheduled for blowing in within the next week or so, and there is some question as to how the situation will take the increased supply. Reports now have it that the contract recently made by the Lackawanna Steel Co. for 15,000 tons a month over the second quarter was at nearer $3.25 than $3.50. There are negotiations on other contracts, but the parties are not getting together very well and it is possible coke will be bought from month to month.

Foundry coke remains firm and in good demand. The market is quotable as follows: Spot furnace, $3.50; spot foundry, $4.25@$4.75. The *Courier* reports production during the week ended March 18 at 75,800 tons by the furnace ovens and 38,220 tons by the merchant ovens, a total of 124,020 tons, a decrease of 1,940 tons.

UNIONTOWN

The coal market on the eve of the strike may be definitely described as soft. Some contracts have been offered local producers for delivery after April 1 but few have been closed. The offerings generally have been at a price slightly above the present market but the view generally among operators is that they desire to keep their tonnage open to take advantage of any favorable market development and certainly are not attracted by a price based upon the present market.

However, a price reaction on the market is not expected for some little time. Most consumers who must have an uninterrupted supply have anticipated the strike by stocking a surplus and even after piles are exhausted the production from the unorganized districts will be able to meet the demand for an extended period. Prices are: Sewickley, $1.25@$1.35; Pittsburgh steam, $1.40@$1.50 and byproduct, $1.50 @$1.60.

Chicago and Midwest

Heavy Stocks Likely to Be Needed Before Strike Ends

Buyers Refuse Shipments in Lackadaisical Market—Most of Tonnage Moved Was on Contract or Old Orders—Receipts from East Dwindle

A LACKADAISICAL market prevailed in the last few days prior to the strike. Buyers' indifference was manifested by many refusals of shipments. Spot business was extremely limited and most of the tonnage moved was on contracts or old orders. Screenings moved comparatively well, but in no great volume. Spot prices show a further recession on all but the fines. Receipts of Eastern coals dwindled, even though prices are at the lowest point of the year.

Stocks are very heavy and the opinion seems to prevail that they will be needed before the strike is settled. Yards are cluttered with loads for which there is no demand and a few operators are loading and holding every available car, so that April 1 will find a considerable tonnage on wheels. Domestic coals are practically unsalable.

The Midwest market continues to astonish the coal men with its torpor but they are beginning to get used to that sensation so that less is said about it. It is perfectly plain that everybody who is going to buy coal before the strike has bought and that's all there is to it. The constant expectation of the past few weeks that somebody would start a flurry of buying, is now about dead.

Most industries and public utilities are now supposed to have about 90 days' fuel supply in stock. A few are fixed for about four months. The general opinion is that consumers with big stocks are going to be glad they figured on a long strike. One wise observer in the business declares that if the strike runs 60 days it will run until next fall and he is inclined to think it will go all the way though he believes Frank Farrington, president of the Illinois miners will do his level best to make a separate agreement with operators of this state.

Many coal producers in the middle states declare they are not trying to roll up any stocks at the mines in anticipation of the strike, for they can't see any market until late in the summer. However, the slightly freshening call for screenings compels most mines to make a good many cars of prepared sizes which are sluggish and are beginning to clutter up mine yards.

Throughout this district during the past week there has been general weakening of prices on everything but screenings. This includes non-union coal from the East which has been known to sell in Chicago, in distress, at $1.05, mine run. It was generally agreed on Saturday that quotations on prepared sizes had shaded down about 25c., while screenings generally had ascended nearly as much. Southern Illinois coal of this class touched $2 and in one or two cases sales were made at $2.15. Central and northern Illinois screenings showed the same tendency in less degree.

CHICAGO

The Chicago coal market could hardly be any more lackadaisical than it was during the past week. Nobody did any business to speak of beyond taking care of contracts and orders already booked. Screenings of all sorts moved fairly well, though no great volume was handled. "It wouldn't have made business any better if a million cars of screenings had been ready to deliver" commented a sales manager. "There was only a little demand and the supply took care of it nicely." Prices moved upward about 25c. a ton, making the average for southern Illinois screenings $2, central Illinois about $1.80 and northern Illinois $1.70.

Buyers continue to be of distinctly independent turn of mind refusing shipments on slight pretexts, sometimes, making the life of the coal wholesaler unhappy. There is no scramble for any coal on the trading list, even for low-price non-union fuel from the East which is now selling in small quantities in Chicago for lower prices than at any time this spring. The call for Pocahontas, for instance, is so light that mines in that West Virginia region have been known to offer shipments to Chicago and then fail to make them because some other market at a few cents higher price was found at the last minute.

Retail trade in and about Chicago amounted to almost nothing at the end of last week, after a swell that was hardly perceptible following the colder weather earlier in the week.

SOUTHERN ILLINOIS

The pre-strike quietness in the Carterville field has been uncanny. There is no demand for any one particular size, except with a few companies who have screenings contracts.

There are no price changes except that here and there an operator in his anxiety to move lump, egg and nut has made some quotations that are far below the cost of producing. Railroad tonnage is unusually heavy on all roads and cars are plentiful.

Somewhat similar conditions prevail in Duquoin and Jackson county fields, except that the railroad tonnage is not much of a factor. Working time, however, does not average as well as in Carterville. Mt. Olive has shown up somewhat better, principally on account of the railroad coal, although a good tonnage of domestic has moved to the Chicago market and a little to Omaha.

In the Standard field there is little, if any, change. A good tonnage of railroad coal is moving and the mines are getting three or four days per week. Those working on railroad coal get practically full time.

ST. LOUIS

A little cold weather helped the domestic business for a few days on the cheaper grades in small lots. Country domestic business is easing off. All country dealers seem pretty well stocked up for what they think their requirements will be. The same applies to city dealers, although the bulk of this coal is for small steam plants.

There is little demand locally, for a few plants have gradually accumulated some storage and others figure they can get along without it.

The cement and public utility plants have gradually put some coal away in the past two or three months and are able to take care of themselves for 60 days. Other plants figure that if the price of coal goes too high it will be cheaper to suspend.

WESTERN KENTUCKY

Western Kentucky is plodding along with comparatively little new business, although there is some demand for screenings, which are scarce in view of the light production of lump. One field will probably be closed down almost completely by the strike, but the other is under a wage agreement with a year to run. There are several big operating companies which are not unionized, which will probably be able to supply large tonnage.

Most producers have practically no business without strike clauses, while there is very little contract stuff for delivery after April 1.

LOUISVILLE

Demand for screenings has been better and prices are firmer. Poor production of lump is making for such short screenings supplies that some operators are cutting back to a mine run basis of operation, and are finding better demand for mine run in view of the fact that industrial concerns are being forced to take it.

The general attitude toward the strike is one of indifference, retailers having enough yard stocks to take care of them for a good while. Most of the retailers' purchases have consisted of steam coal, however, as the larger ones have good supplies of lump on hand.

Jobbers and producers do not appear to care one way or the other, some not even keeping up very closely with the daily press reports out of Indianapolis headquarters. Some of the operators met here last week, and informally discussed the strike situation. Much of eastern Kentucky and a part of western Kentucky will not be affected.

INDIANAPOLIS

Reports from the mines in the state show a big increase in production, most of which appears to be purchased by the Indiana market. It is the opinion of jobbers that this condition will prevail until the mines finally are shut down by the strike. Were the retailers as much in the market for prepared coal as the industries are for steam grades this would be the best season since the war period.

The public service companies appear to be most concerned about reserve supplies. Other industries are not greatly worried, since in most instances they are not producing to capacity.

Northwest

Storage Orders Are Few; Docks Cut Working Time

Mild Weather Reduces Current Needs—Dock Supply Is Adequate Strike Safeguard—Prices Firm, but Movement Declines—Anthracite Very Sluggish—Bituminous Screenings Scarce.

MILD weather has removed the urge to buy so much coal for current needs and the strike fails to stir the consumer to any great storage activity. Docks have been caught in the backwash of storm orders filled and the disbelief that the strike will cause any shortage. Anthracite has been the hardest to move and only for bituminous screenings is there any demand.

Utilities have quietly accumulated surplus tonnage and railroads have drawn heavily on their contracts, mainly to avoid congestion and to have coal where it is needed. Prices are firm, as the trade feels that orders to be filled during the strike period will clear the docks before it is necessary to restock under the new conditions.

MILWAUKEE

The market continues on an even plane, with little enthusiasm manifested either in wholesale or retail circles. The outward movement by rail is slightly improved, probably because interior consumers are guarding against a possible strike shortage.

At present there seems to be no thought that prices will be any lower until there is a change in the scale of miners' wages. Dealers say, however, that cheaper coal is coming. There is no apprehension as to the sufficiency of the supply to meet any event. The anthracite supply is nearing the end, however, and the yards are replenishing their stocks by rail. From 25,000 to 30,000 tons of anthracite are tied up in the ruins of the Milwaukee-Western Fuel Co.'s sheds, which burned a few months ago. It is thought that when this coal is available there will be sufficient anthracite to pull through the summer months.

DULUTH

A slump in the market was most evident here last week with shipments from the docks falling off in response to mild weather and a general disbelief that a coal strike will cause any serious shortage. Anthracite was the hardest hit. Docks are laying off men and cutting down loading days.

From one source, however, the demand is steadily increasing. That is from the public utilities. These evidently feel that they can afford to take few chances, and that a prolonged strike is in order.

Railroads also are taking their share and are filling coal depots to capacity. In the majority of cases this coal was contracted for some time ago, and the present shipments mean only a clearing of dock space.

Industrial demand and iron range activities seem to have reached the lowest ebb possible. The probability is that a return to buying will have to come soon as many plants are increasing manufacturing activities.

Bituminous coal prices remain firm all along the line. Screenings are selling well and there is a possibility of a real shortage soon. Other classes, while not doing well, are holding price levels.

MINNEAPOLIS

After a period of severe storm, the Northwest has had mild melting weather and there has been little need of much heating. This seems to have taken away about all the buying incentive. The threat of a strike on April 1 is well known, but very few seem to be giving much heed to it.

The danger to the Northwest is a complex one. There is an ample store of coal on the docks for some time to come—two or three months or longer. If the strike is prolonged and production on a full scale is not resumed until toward fall, then the demands from all sections will be so great that there will be no surplus available to fill the docks of the Northwest for the winter's supply.

But any stocking now in advance of early needs takes a chance that prices after the suspension is over, will be lower than present costs. Anyone laying in coal on present prices may take a sharp loss, so aside from the needs of the immediate future, but little buying is going on.

While commercial conditions have shown better prospects, there has been but little improvement in the volume of buying. Steam orders have been on a restricted scale for a long time. Now and then there has been a pickup, but it has been for a brief period only. Price conditions have been about the same since the adjustment on Eastern coals, involving an advance of 50 cents by those who had not made that advance several weeks before.

New England

Inquiries Few, Stocks Heavy, Marine Freight Market Weak

Spread of Textile Strike a Depressing Factor—Pennsylvania Operators Out of Running—Contracts Offered on 1917 Scale Basis

INQUIRIES are at a low ebb and much sales effort is needed to place tonnage in this market. Stocks are heavier than anticipated and the spread of the textile strike is a further unfavorable market factor. What little contracting has been done is only with old connections and consumers are averse to signing up for their needs at this time. Pennsylvania operators are about out of the running because of the competition from Hampton Roads. Some operators, however, are making contract offers based on the 1917 scale and this apparently is the program of those shippers who are free from the union.

Requests of two railroads for contract bids brought a flood of offers recently. Coastwise freights are expected to soften with lack of inquiry.

Steam trade continues unruffled. There is only light inquiry, and it still takes a lot of hard work to move coal arriving on the market. Prices on cars Mystic Wharf, Boston, range $6@$6.15 for smokeless grades, but sales at these figures are only scattering.

Certain of the agencies are trying to close contracts, but other than those who have made informal arrangements with usual trade there is very little doing with respect to season's supply. Pennsylvania operators are also trying to interest buyers in contract terms, but this territory is so dominated by Pocahontas and New River that very little tonnage is likely to result from such efforts.

At Hampton Roads the visible supply is somewhat less than a week ago, but this is due more to increased inquiry for prepared coal in the West than to any better demand coastwise.

Both the New Haven and the Boston & Maine are rumored to have made purchases within a week. The former received bids for around 300,000 tons at Boston, the lowest bid being $5.39 alongside for Kanawha, the other bids ranging up to $5.90 alongside, all for high-volatile. Last year the price on the same contract was $7.05 alongside. The Boston & Maine is understood to have bought 300,000 tons from the Pond Creek interests.

Coastwise freights continue on a moderately easy basis. The trade expects the freight market to simmer down to 90c or so for steamers, but at this writing there is a notable lack of inquiry. Barges, 2,500 tons and upward, are still quoted $1.10@$1.15.

A further canvass of steam-users in shows reserves even larger than the the Eastern section of this territory 90 days stocks heretofore reported. The average now is at least 100 days, with several manufacturers carrying four-months' supply. The textile strike is spreading and this continues to be an unfavorable factor in the current market.

Eastern Inland

Coal Men Face Dull Times If Strike Is Not Prolonged

Heavy Stocks and Assurance of Adequate Non-Union Supply Preclude Eleventh-Hour Buying Against Strike —Opening of Lake Market Deferred

NO eleventh-hour buying against the strike has developed, as consumers are generally well stocked and have assurance of an adequate non-union supply. Uncertain deflation factors, because of the strike and freight rate situation, are delaying the opening of the Lake market. While the industrial outlook in this section is showing some improvement, it is certain that dull times for the coal man are ahead if the strike is not prolonged sufficiently to use up present heavy stocks.

Stocking programs of the railroads and public utilities have been modified at the last minute. The market has boardered on dullness and some distress coal has appeared.

COLUMBUS

Better buying of steam grades is developing. This is not as marked as might be expected under the circumstances and apparently the public has not been frightened to any extent. Stocks on hand are rather large. Railroads have accumulated stocks of about 60 days; public utilities in excess of 100 days and general manufacturing about 75 days or more.

There is still considerable coal moving but this is the result of orders booked early in March. Mine run is not quite as strong, while screenings are holding up fairly well. Purchasers who have not accumulated large stocks are still marking time but in all cases there is little fear of a fuel shortage.

Retail business continues quiet. Dealers are only buying what they need for the present. Few if any have stocked up to any extent. Retail prices are firm at former levels.

CLEVELAND

Union activities in preparation for the walk-out against a reduction of war-time wages has aroused no especial interest on the part of consumers. The feeling prevails that the miners must enjoy certain mental stages of excitement of the strike before they will be willing to get down to the "brass tacks" of a sensible settlement. According to information coming from sources close to Washington officials, the Government will make no move until after the strike has started and both sides have been allowed to blow off a little steam.

It is the possibility of a reduction in wages which is affecting the attitude of buyers. Coal is now selling for about 70 per cent above mine prices before the war, largely due to the high wages prevailing. Before the industrial structure can attain equilibrium the wages of coal miners and railroad labor must be reduced in line with other workers.

The industrial outlook continues to improve. This is due to better operations at steel, automobile and tire plants. The steel industry is operating at about 70 per cent of capacity, compared with the low point of 29 per cent in July. Last week saw higher prices for steel products, which with increased production brightens the outlook for industrial coal buying.

Bituminous coal receipts showed a further recession during the week ended March 18. Total receipts were 1,568 cars; divided, 1,175 to industry and 393 to retailers, a decrease of 77 cars.

EASTERN OHIO

Production aggregated 399,000 tons or approximately 64 per cent of potential capacity during the week ended March 18. This is an increase of 10,000 tons over the preceding week and registers a new high mark in weekly output for the current year.

Current consumption of steam coal has not been more than 60 or 70 per cent of that which has been produced during the past 60 days. The storage programs of the carriers are nearing completion and the proportion of tonnage mined going to them has receded, being offset by a better demand for storage fuel from some of the larger industrial users.

Retailers say that domestic consumers have stored sufficient coal to tide them over the remainder of the winter season, and that the lower temperatures prevailing during the past week have not resulted in any flurry of demand in retail trade.

There is no perceptible improvement in inquiries, and the market situation borders on dullness. Some small quantities of "distress" coal have been sold in the open market at ridiculously low figures aside from which the range on spot coal shows little change.

In the Lake trade, eastern Ohio is, as yet, manifesting little interest. Permits have been issued by the Ore & Coal Exchange for the loading of some 300,000 tons of coal including fuel, but this tonnage is spread over all the fields which participate in this trade. With some 3,000,000 tons at the Head-of-the-Lakes, coupled with the uncertain deflation factors as to mine labor and freight rates just ahead, the start this year will necessarily be delayed.

NORTHERN PANHANDLE

On the eve of a strike conditions remain virtually unchanged. Railroads are securing a little additional fuel but commercial users are not taking a large volume of tonnage. Non-union or open-shop mines are able to secure some business as a result of lowered mining costs.

PITTSBURGH

No new strike attitude on the part of the operators is being disclosed, producers being ready, as at all times since their formal announcement late in December of withdrawal from the Central Competitive Field, to meet the miners of the district.

It is difficult to sell either union or non-union coal at this time, while holders of contracts have been taking extra tonnages for some time past, and contracts expire April 1.

It is not improbable that some of the non-union mines on the fringe of the district will have strikes April 1 and it is not entirely impossible that some mines in the Connellsville region will have trouble. A few months ago it was understood that many union miners from the Pittsburgh district were working in the Connellsville region, but there may not be so many retained on the payrolls at this time. A fair guess seems to be that some of the miners at non-union mines which have been running well will be disposed to strike while men at union mines that have been more or less idle will be inclined to seek employment.

As a result of very light demand prices have been softening further. Sewickley vein coal has been freely offered down to $1.25, while some of the best byproduct and gas coals in the Connellsville region can be picked up at not over $1.75. The Pittsburgh market is also softer, being quotable roughly as follows: Steam slack, $1.30@$1.50; gas slack, $1.50@$1.60; steam mine run, $1.80@$1.90; high grade gas, ¾-in., $2.60@$2.70; Panhandle 1¼-in. domestic lump, $2.75.

BUFFALO

Consumers will not need much fuel for at least a month in a good many instances, while a two-months' supply is not uncommon here. It will be a difficult time for the salesman in case the expected strike fails to last as long as expected.

Local offices say they will have plenty of coal to sell and that they have made arrangements accordingly. They foresee a quiet time for many weeks, since customers are already so hard to find.

Prices are not nearly as strong as it was predicted they would be at the end of this month. Some easing off in slack prices is reported, but this is not likely to last long. Quotations run about $2.50 for Youghiogheny gas lump, $2.25 for Pittsburgh and No. 8 steam lump, $2 for Allegheny Valley and other mine run and $1.60@$1.70 for slack, adding $2.36 to Allegheny Valley and $2.51 to other coals for freight.

DETROIT

There is no active demand from either the steam plants or domestic consumers. No particular increase in volume of buying is apparent as a result of the strike action.

The seeming indifference among buyers is caused by a feeling that their requirements will be supplied by shipments from the unorganized territories. Basis for this may be found in the fact that something like 90 per cent of the present supply is coming from the non-union mines.

Ohio lump is quoted $2.50@$2.75, egg, $2.25, mine run, $1.85, slack, $1.50. West Virginia lump is offered at $2.25@$2.50, egg, $2, mine run, $1.50, slack, $1.30. Pittsburgh No. 8 1¼-in. lump is $2.35, ¾-in. lump, $2.15, mine run, $2, slack, $1.85. Smokeless lump and egg is $3.25,

Cincinnati Gateway

Unsold Tonnage Piles Up; Market Interest Slackens

Strike Order Fails to Hold Market—Adequacy of Non-Union Supply Reassures Consumers—Cancellations Are Numerous—Screenings Firm as Production Is Limited.

THOSE who looked for business to brighten with the strike declaration of the union leaders have been badly mistaken. Instead of a buying rush there has been a decided slackening of interest. Loads are piling up at Portsmouth and are the heaviest of the year at Russell. While still inquiring for prices, the consumer is not at all active when it comes to placing orders. There have been numerous cancellations lately because of the apparent sufficiency of non-union supply.

Screenings show the best relative position, not only because there is some demand for this size but also because lump production is low, causing a scarcity. The domestic market is dead, despite price cuts, while retailers report very sluggish business.

LOW-VOLATILE FIELDS

New River and the Gulf

New River production increased slightly during the week ended March 18. However, there does not appear to have been any general increase in the demand, smokeless being plentiful on the market. There is ony a fair demand at Tidewater and prices are decidedly soft.

Gulf production is steadily climbing as reflected in a heavier movement over the Virginian Ry. with train and shop crews being called back to work. So far, however, the output has not gone beyond 65 per cent. Labor shortage is interfering with production to some extent.

Pocahontas and Tug River

The Pocahontas output declined to some extent as the demand weakened and at various points on the Norfolk & Western there were a good many "set-outs." Terminals were blocked in some instances. Toward the latter part of the week, however, the situation became much better insofar as the Western movement was concerned. The Eastern market has been rather sluggish as compared with conditions prevailing during the earlier part of the month.

Tug River mines continue to produce coal in large quantities, with the output in excess of 110,000 tons a week or above 75 per cent of capacity. Some trouble is being experienced in securing enough open-tops. All the mines in this field are working. The movement is largely to Western markets, the greater part of it on contract.

HIGH-VOLATILE FIELDS

Kanawha

Few mines outside of the small percentage working on a non-union basis are producing any coal. The market is poor with prices so low as to debar union mines from attempting to enter the market or even from making contracts for the next coal year in view of the uncertainty of new wages to be paid in this territory.

Northeastern Kentucky

Owing to a cessation of steam buying for storage purposes, there is comparatively little market. It is next to impossible to dispose of lump. A scarcity of screenings has bolstered prices, which are close to the price for mine run. Some buyers have canceled orders now that it appears to be so easy to secure all the steam coal they need.

Logan and Thacker

Prevailing market conditions are not affecting the Logan production and the output continues at the rate of 300,000 tons a week, with nearly all mines working at full capacity. The mere fact that the mines will be in a position to continue in the event of a strike is giving operators a strategic advantage in securing orders.

Thacker production continues at the rate of 60 per cent of potential capacity. Companies are making arrangements to increase their capacity. The larger part of the output is destined for Western markets, the principal demand being for steam grades. Producers in this field who lost their market during a strike have regained such markets in large part.

SOUTHEASTERN KENTUCKY

The market has been in a very unsettled state. There has been a little strengthening here and there in steam and mine run but further weakening in block and egg.

The effect the strike will have on this field is still vague. Some of the larger operators have recently signed an agreement with the 19th District—headquarters at Knoxville—providing for two years' work on the basis of the 1917 contract, and it remains to be seen whether they will be able to work under this agreement after April 1.

CINCINNATI

Some Tidewater business is showing here as a result of temerity on the part of seaboard consumers, but the figures quoted to them did not excite immediate buying. Most of the trade were inclined to look upon these as feelers and not as prospects of quick sales. Inquiries from other sources are still numerous, but refusals have also been growing in volume.

Demand for smokeless lump and egg has fallen away to a point that reductions in prices have been forced to stimulate business. Mine run has been holding its own; nut has been a little weaker with a lessening of demand from the West, while better buying by byproduct plants hold top-grade screenings to the high figure.

High-volatile nut and slack and mine run prices are now so closely aligned that some of the southeastern Kentucky operators find it necessary to cut prices to make sales and for the first time in three weeks the low has been under $1.25. Lump is a drug on the market though gas coal was inclined to be a bit higher than it was last week.

Retailers are indulging in price cutting once more. One firm quoted smokeless at $7.50 for lump and another countered with a $7.25 price. Best grades of Elkhorn lump are offered at $6.50 and some other ordinary coals at $6. Slack holds at $4.50. Further reductions are threatened.

South

VIRGINIA

After a temporary slump, the output is increasing, being now about 70 per cent of potential capacity or 140,000 tons a week. In some sections the production is even larger. There is a heavier run of business as the strike approaches. The fact that mines will be able to continue operations despite a strike is bringing business to the field. There is so much steam coal on the market, however, that prices have undergone little or no change.

BIRMINGHAM

The spot steam market is somewhat more active. Inquiry is such as to create a more optimistic spirit in the trade, even though no great increase in actual business booked has yet materialized. Outside of a few railroad and utility contracts which are coming up for renewal, consumers generally are manifesting no interest in providing for their needs in advance of a few weeks. Producers are in a position to supply on short notice any tonnage which might be required to tide over consumers in nearby territory whose supply might be interrupted by labor disturbances.

Railroads are taking a great deal more coal and are accumulating considerable reserves against possible interruption to supply. Several additional furnaces have been placed in blast recently and the consequent need for an increased coke supply has added to the coal production.

The domestic market is extremely dull. Sales are limited in number and tonnage to such an extent that producers are seeking an outlet for their output in the industrial field.

Quotations on commercial coal show no change of importance, but with the near approach of the new year domestic prices have weakened to some extent. Figures f.o.b. mines are as follows:

	Washed	Lump and Nut
Big Seam	$1.75@$2.00	$2.00@$2.25
Carbon Hill	2.00@ 2.25	2.00@ 2.25
Cahaba	2.00@ 2.25	3.00@ 3.50
Black Creek	2.00@ 2.25	3.00@ 3.50
Pratt		
Montevallo		4.50

News Items From Field and Trade

ALABAMA

A company is being organized to take over a large body of undeveloped coal lands in the Walker County field. Owners of mineral properties are being requested to take options on their holdings. It is understood that if the new interests are able to secure the desired lands that they have assurance from the Illinois Central that it will build a branch line into this field from its main line at Haleyville. A large corps of engineers were making extensive surveys in the county some weeks ago.

COLORADO

Eight miners are known to have been killed and ten are missing as the result of an explosion in Sopris Mine No. 2 of the **Colorado Fuel & Iron Co.**, near Trinidad, Colo. The explosion, which occurred in the main workings, 3,000 ft. inside the mine, happened just after the 200 members of the day shift had left for home.

CONNECTICUT

A. H. Powell, wholesale coal dealer, New Haven, is securing bids for the construction of his proposed office building. The building will be twelve stories high, and will cost close to one million dollars.

Percy T. Litchfield, of the New England Coal Co., Bridgeport, is a member of the committee recently chosen by the Chamber of Commerce to combat the efforts of the Connecticut Company, street railway lines, to enforce a 10c. fare in Bridgeport, in place of the present 5c. rate.

Fire destroyed the garage and a large shed at the coal plant of **F. U. Newcomb**, retail coal dealer, Litchfield, recently. The damage was estimated at around $15,000.

The American Coal Co., Hartford, has started the construction of a brick addition on Spruce St., that city.

ILLINOIS

George Cox, construction engineer for Mead, Morrison & Co., of Chicago, sailed from San Francisco recently to superintend the work of installing a bunker terminal at a cost of approximately $2,000,000, by the Union Steamship Co. This will be the second large coal bunking plant to be installed in the Antipodes.

O. M. Burnett, president of The Chicago Big Muddy Coal Co. spent a week recently on a trade trip through northern Illinois and southern Wisconsin.

Otto Hertel, combustion engineer for the Old Ben Coal Co., is slowly improving in a Chicago hospital after a long illness. **D. W. Buchanan** of that company made a trip of inspection among the Old Ben operations in Southern Illinois late in March.

No. 14 mine of the **Old Ben Coal Co.** at Buckner, has been closed down. The mine employed about 350 men. The company announced that lack of market made the closing necessary.

Irwin McKee has joined the Bell & Zoller Coal Co., at Chicago, as combustion engineer, assisting V. G. Leach. The company is expanding its department of fuel studies for consumers.

A movement is now on foot to establish a coal trade bureau among the retailers of Chicago. The members will be expected to pay 5 cents a ton toward the cost of maintaining a demonstration and testing station and an advertising campaign both calculated to educate the consumers in better methods of firing and in better selection of coal. A number of dealers have already signed an agreement to join.

INDIANA

Frank C. Gove, an attorney of Evansville, has been appointed receiver for the **Fricke & Blair Coal Co.** The company operates a coal mine in Warrick County a few miles east of Evansville. The suit asking for a receiver was filed by the Orr Iron Co., which alleges the coal company owes debts amounting to more than $40,000.

The Terra Haute Welfare League is distributing coal to the needy of that city with the cooperation of coal interests and the Pennsylvania Railroad which has given the League a year's lease on temporary coal yard property fronting on a switch. Those who get fuel from the League and who can pay a little for their coal are permitted to do so. The destitute get it free. Nobody in Terra Haute is suffering.

The Ogle Coal Co., Indianapolis, filed suit recently in Circuit Court asking the appointment of a receiver for the **Capital City Coal Co.** It is alleged that the Capital City company, a retail distributing company, owes the Ogle company, a firm of coal brokers, a note of $11,686.56, upon which only $4,439.74 has been paid. The note was executed Dec. 10, 1920, and is due on demand, according to the complaint. It is alleged the company is dangerously near insolvency, but could be saved through a receivership.

The Eagle Coal Co., of Terre Haute, has filed articles of incorporation with the secretary of state, with a capitalization of $100,000. Andrew T. Spears, secretary of the Black Hawk Coal Co., and William Charlotte, of Indianapolis, are directors. The company will lease coal lands in the southern part of the state. Three hundred acres have already been leased in Fayette township.

The Lower Vein Coal Co., of Terre Haute, has filed suit in the Superior Court against Alice Landis, the Sisters of Providence of St. Mary-of-the-Woods, and Isaac E. Fulmer, asking for the condemnation of the land owned by them. The company asserts they have placed a prohibitive price on the land, which, the company says, is needed for the development of 1,000 acres of coal land owned by it. The company desires to obtain in a right-of-way for a switch through the land to the coal field. Members of the company assert that unless a right-of-way is obtained at a reasonable price, the Big Four will not put in the switch, but that the C. & E. I. will enter the field from the opposite side. The company asserts that if the right-of-way is not obtained, 200 men will have to move from Terre Haute city to Clinton, and asks the court to appoint a group of men to investigate and place a value on the land desired.

A coal stripping mine will be opened in the field east of Oakland, during the coming summer. F. I. Conyers, representing Eastern interests, has obtained 8,000 acres of strip coal land. Engineers for the Big Four are surveying a switch line to the coal field. Five shovels will be operated and tipples and other necessary equipment will be completed before next winter. **The George A. Enos Co.**, now operating, is loading fifty cars of coal each day. Two stripping shovels and two loading shovels are in operation.

KENTUCKY

The Liberty Coal & Coke Co., operating at Straight Creek, is featuring the fact that the lightest coal is necessarily the purest. The company has built up quite a good retail connection in Louisville.

The Harlan-Kellioka Coal Co., Harlan, has filed amended articles increasing its capital stock from $120,000 to $250,000.

L. W. Milner, of the **D. H. Brown Coal** Co., Birmingham and Atlanta, has been visiting the Pineville and Harlan sections.

Coal production in Kentucky decreased more than 22 per cent in 1921 as compared with 1920, according to the annual report being compiled in the office of **L. Blenkinsopp**, state miner inspector. The number of mines decreased 28 per cent, the number of men employed more than 14 per cent. In 1921, the state produced 30,282,669 tons, as compared with 28,892,044 the previous year. The number of mines decreased from 834 to 569, and the number of companies from 790 to 525. Employees outside the mines numbered 12,881 in 1920, and 9,819 the following year, and the number of inside employees fell from 44,466 to 39,971.

The Service Fuel Co., capital $100,000, has been incorporated to do wholesale and retail coal business by A. D. Kirkpatrick, Russelville; J. L. Rogers, Greenville; J. B. Torbert, Owensboro.

The Bishop Coal Co., capital $20,000, has been incorporated by Oscar Bishop, Hartford; J. S. Victor, Middlesboro; O. M. Bishop, Centertown.

MICHIGAN

The Peoples Coal & Builders Supply Co., Flint, has decreased its capital from $150,000 to $75,000.

George B. Barry, formerly with C. C. Corey, of Detroit, has been added to the sales force of the Virginia Coal Co., with headquarters in Detroit.

MINNESOTA

C. Van Duyn, for many years a resident of Duluth and well known in selling fields, has taken charge of the Grand Forks office of the Inland Coal & Dock Co. Mr. Van Duyn has succeeded in moving considerable coal in North Dakota recently, which is a difficult task in the face of the financial slump throughout the state.

A. K. Oehl, secretary of the Pittsburg Coal Co. has been visiting Duluth and Superior on a tour of inspection before the opening of navigation.

MISSOURI

The Allburn Coal Co. is being incorporated at Plattsburg and will take over the property of the **Plattsburg-Vibbard Coal Co.**, which is invoiced at $65,500. The plant will be rebuilt. The intention is to have the mine in operation when the new labor contract with the miners is signed. The stock in the new company is being taken largely, if not altogether, by the members of the old company.

NEW YORK

The report of the **Island Creek Coal Co.** for the calendar year 1921 shows a net profit after all charges, including taxes, of $2,740,706, equal after preferred dividends to $20.55 per share on the 118,801 common shares. This compares with earnings in 1920 equal to $18.37 a share on the common, $7.45 in 1919 and $7 in 1918.

Report of the **Pond Creek Coal Co.** for calendar and fiscal year 1921 shows net profits after all charges, including interest and taxes, of $542,754, equal to $2.54 a share on the 212,920 shares of stock. This compares with $2.82 a share in 1920, 97c. a share in 1919 and $2.68 in 1918.

The 20th annual report of the **United States Steel Corporation** shows that during 1921 there were produced from the corporation's mines 21,627,939 tons of coal as compared with 30,828,334 tons in 1920. Of this tonnage 14,546,103 tons were used in the manufacture of coke and 7,081,836 tons for steam, gas and other purposes. The corporation also manufactured 1,698,178 tons of coke in beehive ovens and 8,127,086 tons in byproduct ovens, a total of 9,825,264 tons, as compared with 16,208,111 tons in the previous year. There was expended on the coal and coke properties of the corporation $9,074,691.92, of which $6,059,945.28 was spent for the acquirement of additional acreages of steam coal in Greene County, Pa., and for surface land for new plants and town sites in Washington County, Pa. In the Connellsville District there was expended $661,677.13 at Colonial Nos. 1, 3 and 4 works for facilities to increase the output and for underground transportation through Alice Mine to Colonial Dock. Other expenditures included $148,786.73 in the Pocahontas field. The coal property owned by the subsidiary companies consists of 418,587 acres of coking coal and 337,733 acres of steam and gas coals. There are 65 coking plants with 20,236 beehive ovens and 2,992 byproduct ovens. There are 60 coal mining plants not connected with coke plants and 9 coal washing plants.

Robert M. Gates has recently become associated with The Superheater Company, with headquarters at New York City. Mr. Gates was formerly a partner of the Herron Gates Co., of Cleveland, handling power plant equipment, prior to his association with the Lakewood Engineering Co.

The C. W. Hunt Co., Inc., of West New Brighton, S. I., announces the re-establishment of its New York City office at 143 Liberty St. It has taken over the sales and engineering work which has heretofore been carried on by its subsidiary company, the C. W. Hunt Engineering Corporation.

The Elkhorn Coal Co., for 1921, reports gross income of $2,195,158, against $5,374,049 in 1920. After all charges including depreciation, depletion and interest, there was a net loss of $380,990, against net profits of $1,404,754, equal to $4.20 a share on the $50 par value stock reported in 1920. The profit and loss surplus on Dec. 31, 1921, was $909,640, against $1,686,582 at the close of the previous year.

A coal survey is being undertaken in Buffalo under the auspices of the United States Bureau of Mines. An office has been taken by **George S. Brewer**, fuel engineer of the bureau, and **B. J. Hatmaker**, consulting geologist. The purpose of the survey is to develop a "rational plan for dealing with fuel problems, having in mind efficient utilization of available resources, cleanliness, the health of the people and reasonable cost."

The Virginia Iron, Coal & Coke Co. reports net earnings for 1921 of $355,458, equal to $3.35 a shart on the old capitalization of $10,000,000 outstanding at the close of last year. Gross earnings for the year amounted to $3,842,882 and operating expense $3,[illegible]3,274. Fixed charges, bond interest and taxes totaled $424,150.

The State Legislature just before adjournment passed the Swift bill (Senate Print No. 1719) amending the public service commissions law authorizing any gas corporation to submit to commission for approval contract for purchase from producer of byproduct gas for service to consumers, the price to be based on market price of coal. The bill is in the hands of the Governor as a thirty-day bill.

OHIO

N. Bonnist, Cleveland representative of the Morgan-Gardner Electric Co., announces that he has opened a Cleveland office at 1605 Williamson Bldg.

Recent visitors to the Cincinnati market were: **C. D. Weeks** of the Milwaukee Coke & Gas Co.; **W. F. Stahmer** and **Vice-President Hall** of the Fort Dearborn Coal Co., Chicago; **James Bonnyman** of the Bonnyman-Norman Coal Co., of Birmingham, Ala.; **Bruce Hardy** of the Darb's Fork Coal Co., Hazard, Ky.; **C. M. Moderwell** and **A. K. Mordue**, of the Moderwell Coal Co., Chicago; **L. M. Van Hart** of Connersville, Ind., and **Ed Mordue**, of the General Coal Co., Chicago.

A petition in bankruptcy has been filed in Federal Court at Cleveland against the **Buckeye & West Virginia Coal Co.**, of Cleveland, by Charles H. Brown of Ashtabula, general manager of the concern. The property of the concern, located in Upshur County, West Virginia, has been ordered sold by an Upshur County court and Brown's petition says, unless a Federal receiver intervenes, insufficient funds will be realized to satisfy other creditors besides himself.

OKLAHOMA

The Oklahoma Southern Railway Co. has secured a permit and has announced that it will construct a railway line ten miles in length from Vinita, northwest to the coal fields in that section of Oklahoma. Development on a large scale is contemplated as soon as the railway line is completed.

PENNSYLVANIA

Frank E. Peabody, president of the American Coke Corporation, is understood to have taken over the **LaBelle Coke Co.** plant, seven miles south of Brownsville. The deal has been pending for some time. Nearly a million dollars is given as the consideration. The plant comprises about 375 acres of coal and 200 beehive ovens.

Two hundred ovens have been fired at Leith plant of the **H. C. Frick Coke Co.**, after an idleness of nearly a year. Frick coke production is now approximately 35 per cent. Coal output of the Frick company is around 60 per cent.

Robbers who recently boarded an interurban West Penn Railroad car at Thornton, escaped in an automobile with a $22,000 payroll of the **W. J. Rainey Co.**, after shooting an armed guard who was accompanying the custodians of the money.

Richard F. Hentsel, superintendent of Sunshine plant of the American Coke Corporation, at Martin, Fayette County, has been made general superintendent of this plant and the coal and coke plant which the corportion has just acquired from the LaBelle Coke Co.

The property of the Slope Mountain Coal Co., of Shamokin, was recently taken over by the Sheriff and posted for public sale. The company owned a penitentiary built on the side of what is known locally as Kangaroo hill, near the site of the old Royal Oak operation. Within the last forty years or so there have been four operations on and around the tract operated by the Slope Mountain Co.—the Kangaroo and Garfield mines having been operated back in the eighties—and none has been regarded as a model of prosperity.

F. L. Clements has been appointed acting chief of the valuation section, natural resources divison of the Income Tax Unit, Bureau of Internal Revenue. He succeeds **A. W. Gaumer**, mining engineer, who has been named as member of the committee on appeals and review of the revenue bureau.

The Anthracite Production Corporation has received permission from the Pennsylvania Water Supply Commission to dredge anthracite from the Susquehanna River at Holtwood, Lancaster County, near the site of what is generally known as the McCall Ferry dam.

The semi-monthly report of the (Pa.) State Employment Bureau says that on March 1, there were 8,700 mine workers unemployed in the Scranton district, adding: "While all collieries are working practically full time no extra help is being taken on. Evidence of preparation on the part of the coal companies for either a strike or a suspension on April 1, is apparent throughout the district. Of what duration this suspension will be is at present a matter of conjecture."

There were 103 fatal mine accidents reported to the State Department of Labor and Industry in February. Fatal accidents in all other industries for that period numbered 68, making the total for the month 171. Of the mine fatalities, 29 occurred in Fayette County, 22 in Luzerne and 13 each in Lackawanna and Schuylkill, while Indiana had 5, Westmoreland, 4, Allegheny, Armstrong, Somerset and Washington 2 each.

The Pennsylvania Industrial Board has adopted a ruling that children under sixteen years of age may not be employed on coal dredges in those rivers in the anthracite district where coal washed from the collieries is found. In past years boys have been employed during the summer vacation period as helpers.

The Eastern Coke Co., Allegheny County, has notified the office of the Secretary of the Commonwealth, Harrisburgh, that it has increased its capital stock from $900,000 to $1,200,000. Robert W. Flenniken is treasurer

T. J. Brady, who was formerly superintendent of the Connellsville Division of the Baltimore & Ohio, has been made vice-president and general sales manager of the Obrrado Coal Co., with headquarters at Pittsburgh.

A shortage of mine labor is already being felt in some portions of the coke region as evidenced by the following want ads running in the Uniontown papers: **Consolidated Coke Co.**, Mt. Sterling mines, near Masontown, 25 experienced miners; **Jennings Coal Co.**, Cheat Haven, 20 miners; **Warwick Coal Co.**, near Martin, loaders and machine runner; **Sackett & Harsh mines**, Outcrop, 30 coal miners. These companies all offer the Frick scale.

Negotiations have been closed whereby **George Whyel** takes over the holdings of **Frank E. Weddell** in the Consolidated Coke Co. and the Pioneer Coal & Coke Co. Mr. Weddell was secretary and treasurer of both corporations and affiliated companies. The Consolidated company is an operating concern while the Pioneer company is a jobber. His successor in the official positions has not yet been named.

UTAH

The Wasatch Coal Co., the Carbon Fuel Co. and the Morton Coal Co., Salt Lake City concerns, are defendants in an unusual suit. The plaintiff is a Richard E. Tolbert, who claims that on Nov. 28, 1920, he suffered a fractured arm when he fell from the platform of a boarding house operated jointly by the three defendants in Spring Canyon. He asks for $15,000 damages.

The Bureau of Mines is making a study of the efficiency of various systems of coal mining in Utah and southern Wyoming where seams range the thickest in the world. Some deposits are 60 ft. deep.

VIRGINIA

The Kennedy Coal Co. has completed development work in connection with its new plant on Sword's Creek, near Graham, and is opening its mines, having only recently purchased a standard locomotive.

Officers have been elected for another year by the **Fairmont Mining Machinery Co. of Fairmont.** The roster of officials includes: B. A. Linderman, of Chicago, president; O. A. Seyfert vice-president and general manager; Walton Miller, treasurer, and L. C. England, secretary.

Sixty coal dealers of the Middle West were entertained at Norfolk, March 21, by local coal shippers and other business men. The visit to Norfolk was a feature of a tour they are making to study the situation in the mining districts and to inspect handling facilities at Tidewater. The tour was arranged by Holly Stover, of Chicago.

J. G. Miller, manager of the Raleigh Smokeless Fuel Co.'s Norfolk office, has returned from a business trip to Washington.

A. G. Bailey, of Castner, Curran & Bullitt, represented Norfolk in the Interstate Commerce Commission hearing on bunker rates.

WASHINGTON

Articles of incorporation have been filed for the **Yakima Coal & Investment Co.**, with a capital stock of $30,000. Incorporators are J. D. Medill, J. D. Cornett, W. S. Doran, W. J. Aumiller and Cort Meyer.

WEST VIRGINIA

The Barrackville and Dakota mines of the **Bethlehem Mines Corporation** in the Fairmont field were inspected by a party of officials of the company on March 14 and 15. The company is now working its mines in the Fairmont region about three days a week. In the inspection party were T. R. Johns, general manager, of Heilwood, Pa.; W. H. James and T. Blass, of Buffalo; W. H. Beck, of Ellsworth, Pa.; Samuel Steinbach, general superintendent, and Charles C. Hagenbach, of Reedsville. J. P. McCune, general superintendent of the Fairmont district for the company, piloted the inspection party about the plants.

Executives of the **Consolidation Coal Co.** constituted a party who inspected the coal lands recently purchased in southern West Virginia by the company, about the middle of March. In the party were Frank R. Lyon, vice-president; Frank Haas, consulting engineer; R. L. Kingsland, superintendent of the motive and mechanical departments; F. C. Davis, assistant general purchasing agent; Tusca Morris, attorney for the company, and C. H. Pressman, secretary to Vice-President Lyon. Plans do not appear to have fully matured for the big development, but even though the Consolidation has had the plant only a short time additional development is now well under way. Equipment is being rushed to Coalwood, some of it by express.

With all of the sixty ovens of the **Domestic Coke Corporation**, of Fairmont, in blast, fourteen-hour coke is now being manufactured, which is consuming 900 tons of coal a day and which is producing approximately 450 tons of coke. Coke is found to be in better demand, steel concerns using a larger quantity than has heretofore been the case.

The United States Coal & Coke Co., which is one of the leading producers of coal in West Virginia, is now running all its mines in the Tug River field to capacity, this being the first time that has been possible in a long period. This company has twelve mines on the Norfolk & Western and is a subsidiary of the United States Steel Corporation.

Because the **Cleveland & Morgantown Coal Co.**, operating in the Scott's Run field of Monongalia County, will not pay them the regular union scale plus the war-time bonus, miners have refused to return to work at the company's No. 2 mine and hence that mine will remain in idleness. Inasmuch as none of the other companies on Scott's Run are paying any bonus, the company did not see any reason why it should do so and hence the mine will remain closed down.

Considering the fact that it was a short month, the number of fatalities in West Virginia mines in February was larger than usual, 35 meeting their death while working in or about the mines. By far the largest per cent—21 to be exact—were killed under falling coal and slate, but eight lost their lives in mine car accidents. One miner was killed in a motor accident. Two deaths occurred outside the mines. Logan lead all other counties in the number of deaths, there being 8. There were six fatalities, however, in Raleigh County. In Fayette and McDowell counties there were four deaths each but only three in Mercer. Of the miners killed 24 were American and 11 were foreigners.

With the entrance requirements nothing more than a "strong desire to get ahead," an effort is to be made by the **West Virginia University, College of Engineering**, to have 200 miners in the state enrolled in the short course of mining which will be held for six weeks, beginning June 12 and closing July 22. The special summer course, to prepare miners for positions as fire bosses, mine foremen and superintendents, has been endorsed by R. M. Lambie, chief of the State Department of Mines.

W. S. Leckie, of Williamson, one of the prominent operators of southern West Virginia, has been elected as a director of the Commercial National Bank of Williamson.

NOVA SCOTIA

The Florence Colliery, at Sydney Mines, may be double-shifted as the only means of placing the unemployed miners of Alexandra Mine, No. 7. This suggestion was made by General Superintendent McNeal after a recent meeting with mine workers. One hundred and fifty men are idle, owing to the closing of Mine No. 7.

J. B. MacLachlan, Secretary of District 26, United Mine Workers, in a manifesto issued, calls on the 12,000 miners of Nova Scotia to join him in a policy of "cutting the output" as the most effective method of waging a labor war agains the **British Empire Steel Corporation**. MacLachlan is the leader of the more extreme element of the United Mine Workers and proved his leadership a few days ago by opposing and defeating the new Montreal agreement, which was up on a referendum, by a vote of seven to one. Cases of sabotage in the mines have already been reported.

ONTARIO

Four men, who broke into the office of the **Howard Coal Co.**, Kingston, and attempted to open the safe, pleaded guilty to the charge and one of them was sentenced to two years in the penitentiary. Another was given one year and the other two, being youths, were allowed to go on suspended sentence.

WASHINGTON, D. C.

An investigation of causes of death among bituminous coal miners will be undertaken by the Bureau of Mines to obtain, if possible, the principal hazards connected with this industry, in order to better prevent the same when determined.

Investigations have been made by **George S. Rice**, chief mining engineer of the United States Bureau of Mines, and associates, into coal mining, iron mining and potash mining methods in Europe, and studies are to be continued. Mr. Rice is compiling data on the destruction of French coal mines, steel and iron plants, which he collected on his visit to France, and is studying methods of rehabilitation as obtained by correspondence and from current French technical publications.

A number of changes have been made in the **personnel of Senate committees** to which coal legislation is referred. Senator Borah, of Idaho, has become chairman of the Committee on Labor, succeeding Senator Kenyon, of Iowa, resigned. Senator Rawson, of Iowa, who succeeded Senator Kenyon, has been assigned to the Committee on Manufactures.

George H. Cushing, the managing director of the American Wholesale Coal Association, has written a series of ten short articles on the strike situation which were released day by day until March 28. The series were sent to more than two hundred of the principal afternoon newspapers.

H. I. Smith, chief supervisor of mineral leases for the Bureau of Mines at Denver, is in Washington conferring with Interior Department officials.

Bert W. Dyer, who has been serving as Federal mine inspector in Alaska, has been recalled to fill the vacancy created by the death of **George Salmon**, the late assistant supervisor of coal mine leases in the West.

M. Van Siclen, assistant chief mining engineer of the Bureau of Mines, has been detached from the Washington office to act as technical adviser to the Indian service in making new leases for lead and zinc deposits on Indian lands. **E. H. Denny** has been called to Washington to take up the duties of assistant chief mining engineer.

Traffic News

In the complaint of the **Wm. Cramp Ship & Engine Building Co.**, an I. C. C. examiner recommends that the rates on bituminous coal from its Allegheny Ave. storage yard to its ship yard at Philadelphia are unreasonable.

In the complaint of the **Perry County Coal Corporation**, an examiner recommends that the charge of the coal concern that group rates on coal from O'Fallon and Belleville, Ill., to East St. Louis, Ill., and St. Louis, Mo., are unreasonable, is not supported by the evidence and that the rates sought would disrupt a long-standing group relationship.

The Louisville & Nashville R.R. asks for an equitable division of joint rates on coal from stations on the **Cumberland & Manchester R.R.** to interstate destinations, on the ground that the present division of the Cumberland road is unreasonable.

A refund of $20,000 to Indiana shippers in the Brazil, Ind., coal districts in four rate reparation cases has been ordered by the I. C. C., it was announced by the Indiana State Chamber of Commerce, which prosecuted the claims for the shippers before the commission. The refunding order is the first to be issued, although forty similar cases from that state are now pending. The alleged overcharges involved, being for coal transportation during the war period, amount to $100,000.

George M. Barnard and Edgar M. Blessing, members of the Indiana Public Service Commission have returned from Chicago where they obtained from the Federal Court the authority for the **Cincinnati, Indianapolis & Western Railroad Co.** to continue indefinitely its operation of a part of the coal railway division of the Chicago & Eastern Illinois. The C. I. & W. is operating that part of the division between Brazil and West Union. Its authority to operate the part was to expire March 23. It now may operate until the court gives it thirty days' notice to cease. A proposal for authority to abandon the entire division is pending before the Interstate Commerce Commission. All but the Brazil-West Union part now is inoperative.

In the complaint of the **Southern Ohio Power Co.** an examiner recommends that the rates on coal from mines at Floodwood, Ohio, to the company's plant were not unreasonable.

The I. C. C. has vacated its investigation as to the rates and terminal charges on coal to Gulf ports as the railroads concerned have canceled the schedules which had been suspended until May 8.

The Eighth District Coal Operators' Association of Illinois has asked the commission to deny the request of the Fifth and Ninth Districts Coal Bureau to reopen the Illinois coal cases, and that the commission allow the rates on coal from Illinois mines already prescribed to become effective.

In its investigation of divisions between railroads of rates on bituminous coal to destinations in Michigan, Ohio, Indiana, Illinois and Wisconsin, the I. C. C., upon complaint of the B. & O., N. & W. and C. & O. that they are not receiving proper divisions has served notice on a large number of roads in the territory affected making them party to the proceeding.

In the complaint of the **Traffic Bureau of Nashville** the I. C. C. decides that the rates on coal from Tennessee mines served by the Tennessee Central to Nashville, in effect from June 25, 1918, to Oct. 28, 1919, and from western Kentucky mines served by the Louisville & Nashville in effect from June 25, 1918, to Nov. 6, 1919, were unreasonable because they exceeded the subsequently established rate of $1.20 per ton, and awards reparation on shipments on that basis. It holds also that the rates on coal from western Kentucky mines served by the L. & N. to Clarksville from June 25, 1918, to Oct. 9, 1919, were unreasonable because they exceeded $1.20 a ton.

The complaint of the **Southern Appalachian Coal Operators' Association** will be heard at Knoxville, Tenn., April 24.

The Elem Coal Co., of New York, in a complaint to the I. C. C., alleges unreasonable rates on anthracite from Pennsylvania to New York City.

The Hanging Rock Iron Co., of Ohio, alleges unreasonable rates on coal and coke between its plants on the New Castle & Ohio River Ry. and interstate points of origin and destination.

In the case before the I. C. C. involving reduced rates on coal to Kansas City, Mo., the **Southwestern Interstate Coal Operators' Association and the Oklahoma Coal Operators' Association** have requested reargument of the case. They contend that the report denying reductions in coal rates to Kansas City was contrary to the evidence; that reductions from Southwestern coal fields were made to adjust improper relationships; that the commission should have recommended like reductions to Omaha instead of denying them to Kansas City because of possible preference and that the commission erred in statements in its report and its consideration of the evidence.

In the complaint of the **Reeves Coal & Dock Co.**, the I.C.C. decides that the rates on lump coal from Hillsboro, Ill., to Elroy, Wis., reconsigned to Wausau, Wis., were not unreasonable.

In the complaint of the **Detroit Coal Exchange** an examiner recommends that rates on anthracite from producing points in Pennsylvania to Detroit and Wyandotte are unreasonable.

Coming Meetings

Missouri Retail Coal Merchants Association will hold its annual meeting May 16 and 17 at the Planters Hotel, St. Louis, Mo. Secretary, F. A. Parker, Arcade Bldg., St. Louis, Mo.

American Institute of Electrical Engineers will hold its spring convention at Chicago, Ill., April 19-21. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

National Coal Association will hold its annual meeting at Chicago, May 24 to 26. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham.

Virginia Coal Operators' Association will hold its annual meeting April 15 at Norton, Va. Secretary G. D. Kilgore, Norton, Va.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

Chicago Coal Merchants' Association will hold its annual meeting April 11 at Chicago, Ill. Secretary, N. H. Kendall, Plymouth Building, Chicago, Ill.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 26 and 27 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Fidelity Trust Bldg., Indianapolis, Ind.

The American Wholesale Coal Association will hold its annual convention at Detroit, June 6. Secretary, G. H. Merryweather, Union Fuel Bldg., Chicago, Ill.

The Canadian Retail Coal Association will hold its annual meeting on April 6 and 7 at the King Edward Hotel, Toronto

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at the Stacy-Trent Hotel, Trenton, N. J., June 7 and 8.

Coal Mining Institute of America will meet Dec. 13, 14 and 15 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 911 Chamber of Commerce Bldg., Pittsburgh, Pa.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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Miners' Earnings and Economic Conditions

ILLINOIS is setting a splendid example of preparedness. The operators in that state have for months been assiduously collecting data covering their local industry—data of a character to satisfy the most exacting and calculated to answer the charge of the union that governmental intervention is essential to bring out the facts.

The edition of the pamphlet "Coal—A Few Things the Public Wants to Know," issued by the Illinois Operators Association several weeks ago, has already passed the 165,000 mark and is still in demand. Although largely confined to local conditions, much that is written in that booklet applies with equal force to all bituminous coal operation, and the dissemination of these pertinent facts cannot otherwise than help understanding of the situation generally.

Another such pamphlet is due off the press this week. We predict that it will be another best seller. This second pamphlet covers in detail in turn the earnings of all men employed at a thoroughly representative group of Illinois mines for both 1920 and 1921, classified between tonnage and day workers. These figures show, for instance, that the average earnings in 1921 of all employees was $865.06 and that 49 per cent of the total employees received 83 per cent of earnings, because they worked more days. The average hourly earnings of tonnage men was $1.26 in 1921; of daymen, 95c. Classifying earnings by groups, according to time worked, this report shows how the steady workers—those putting in 75 per cent or more as many days as opportunity offered—had annual incomes in 1921 ranging from $1,200 to $1,800.

It is pertinent to point out here that it is the rate of income of the relatively large group that perform consistently that indicates the adequacy of the wage rate.

To base conclusions on a general average that is lowered by the floater and indifferent employee is unfair both to worker and to employer. The public cannot be expected to support by high prices for coal a surplus of labor in the coal mines. It is pointed out in this pamphlet, for instance, that, "taking all the mines in the State of Illinois as a whole, it has been necessary during the past two years to hire throughout the period of each year approximately 60 per cent more men than the maximum number ever working in the mines on any given day."

Earnings in the coal mines of Illinois are compared with those in other large industries and on the railroads. Railroad workers' earnings are shown to be but 53.5 per cent and in 23 other industries they were but 47.3 per cent of those in the coal mines.

A striking exhibit in the booklet is a comparison of coal-mine rates in Illinois with those paid in districts competitive with Illinois. As these other fields are mainly non-union, the comparison permits the conclusion that "Illinois miners are not in conflict with Illinois operators but with an economic condition."

The pamphlet is thoroughly worth while. It is of a kind to interest and instruct the serious-minded layman who all over the country is saying "What is it all about? Where in this maze of charge and countercharge can I find out the facts?" Large masses are not swayed by reading such an array of cold facts, but solid citizenry is instructed and a background of constructive, well-placed opinion is built up by the distribution of such literature.

The Mismanaged, Inefficient Industry

SENATOR BORAH voiced the impatient protest of an uninformed public when last Saturday he said, as quoted in the press, that unless the coal industry cleans house and is reorganized in the interest of the public, government control or ownership or some other dire thing will happen. Where Senator Borah comes from about the only coal found is that which falls from the Oregon Short Line trains as they roll over the Snake River plains.

The Senator is more nearly right than he realizes. Perhaps the industry knows it too. Mine owners and operators see no immediate possibility of government ownership of the coal mines but they do sense an undercurrent of sentiment for government regulation. The miners have the same vision but with different hopes. The operators—capital, if you will—do not want the government to lay its blighting hand on their business; they know that they can conduct it more efficiently than can a federal bureau. In this the managers of coal mines are no differently disposed than men in all other lines of industry and business. As the New York *Times* puts it editorially, "To speak with a straight face of government operation as a means of eliminating waste and extravagance must be hard for Mr. Borah or anybody else. Look at the figures of the government's balance sheet in the shipping business. Consider the lavish operation of the railroads by the government."

Does the Senator and others who think as he does know that one of the issues at stake in the present conflict involves the endeavor of the miners to perpetuate and extend practices that promote inefficiency and prevent good management? A machine shop that maintained a separate bench for each worker and permitted the workers to come and go as they pleased, permitted them to absent themselves for two days in succession without necessity or formality of excuse and held idle the investment in plant that absence involved, would properly be challenged as mismanaged and inefficient. Yet that is a characteristic of the union coal mines. The coal miner is the freest workman on earth. He is a contractor, he punches no time clock and permits no record of his comings and goings. He enters the mine when he likes and leaves when he deems prudent. His working place—his "room"—is his. Two days' absence without excuse are not penalized. One of the demands of the union this year is that the automatic penalty of a dollar per day for absence beyond two days be removed, as it was before the war.

Outside of coal, the general practice of management is to discharge or furlough workers not needed when demand for its product falls off. From the standpoint of management it is more efficient operation to decrease the force than to run part time with a full crew. The railroads last year effected economies by laying off thousands of men not needed. Factory hands by the thousands were discharged. But every coal operator who could get orders to run his mine even a few days per month gave his men—all his men—the opportunity to share in what business there was. In no other large industry does this humane but inefficient practice obtain.

The union bituminous coal mines in 1921 probably did not average half-time operation—that is, they worked less than an average of four out of eight hours per day. Had the management discharged the less efficient and energetic half of the working force or closed the less efficient mines and then kept the remaining mines going full tilt all day every day, as much coal would have been produced and the cost per ton would have been less. Part-time operation always increases unit cost. But once a union miner or mine worker becomes attached to a payroll the union protects him against discharge.

If Senator Borah will pursue his study diligently he will find that the check-off is the greatest bar to good management in the bituminous coal industry, and he will find that the operators have declared for its rejection in future contracts.

We must ask, however, what in the public interest determines whether the coal industry is efficient or otherwise. Until thrown out of joint by the war and in turn by post-war adjustment, even as now, the bituminous-coal industry gave the United States all the coal it required and it was the cheapest coal in the world. The mine workers produced, and even yet produce, more tons per man per day and per year than in any other important country. The percentage of machine-mined coal in the United States is exceeded nowhere.

The faults which are blazoned on high—intermittency of operation, high wage rates, union domination, penchant for car shortages, overdevelopment and others—are the result of the rapid growth under highly competitive conditions of a wholly disintegrated business composed of provincial, widely scattered units. The remedy of nationalization proposed by the United Mine Workers promises no cure for these basic faults. There can be no effective remedy that does not contemplate the prompt squeezing out of the mass the inefficient mines, which means less workers and fewer operators. If there are, as estimated, 150,000 more mine workers than are necessary for proper functioning, they must go, as must many high-cost mines.

What governmental agency would take such a step? Taking the overcapacity out of the soft-coal industry is a job for management, not for politicians. To seek its accomplishment is the task of the industry, not government. It is the task to which the industry should have its face definitely set.

During the Idle Period Prepare for Resumption

HOW many times during the past year has the state of the mine roads troubled the superintendent—the heavy grades, the crooked, narrow, and even low places, the swags that filled with water, the track that bogged under heavy loads, the roof that was always falling or having to be barred down for safety? Every time that anything other than a temporary correction of these faults was considered it was necessary to put the work off until some time when a definite period of idleness of adequate length made it certain that each portion of the work started could be finished before the mine would have to run again. The length of idle time being uncertain, no large changes could be made, or if they were, they had to be made piece-meal instead of being attacked on a big scale with a loading machine and every facility for cheap work.

Now the time has come when an opportunity is afforded for doing just such work properly and yet at minimum expense. The work so long delayed can now be started with a certainty of being carried out without interruption until it is completed. Transportation always must be difficult if the roads over which it is conducted are uneven and crooked. Now is the time to correct such irregularities, for the roads are now clear for the transport of rock and refuse. A rock face can be created in the roadway without fear that it still will be there when the whistle is blown for resumption. The roof can be blown down without risk that the fall of rock will be in the way of tomorrow's work. Cement and sand can be hauled in without apprehension that it and the machinery for its implacement will interfere with transportation.

Crosscuts can be cleared of road cleanings, and the leaking brattices can be cemented tight, thus lessening air losses. The airways should be cleared of fallen rock and cemented if necessary. Sharp right-angled turns in airways passing large quantities of air should be rounded, or places with easier turns driven. Cribs should be placed where supports are weakened, and every effort should be made to guide the air in the direction planned for it. Where much air passes, the sides and roof should be cemented.

When these losses of air are overcome and these frictional losses are lessened, the speed of the fan or its water gage can be lowered without decreasing the dilution of methane at the face and without any reduction in the quantity of air provided for sweeping the faces free of powder smoke and lamp fumes. No brattice that lies behind a pile of rock and road cleanings can be inspected and repaired, and without inspection and repair it cannot be kept tight.

At no time is it more necessary than during a strike or any idle period to demand reports, to plot records and to calculate results. The number of cars loaded should be recorded, the number of cubic yards to be removed calculated or if the roof is to be cemented the area gunited each day should be known and the progress tabulated.

A strike is a time of a lowering of morale. Most of the men are not working. Care must be taken to see that those who are supposed to be at work are not merely on the payroll but actively engaged and that they are not straggling home before the time appointed. The boss of the gang should be continuously on the job both for safety and for superintendence.

Lining a Shaft in Sixty-Foot Sections, Starting from Near the Top Downward, Greatly Reduces Cost

At Leisenring No. 1 Airshaft Concrete Was Machine-Mixed on the Surface, Lowered Into the Shaft and Poured in 60-Ft. Sections, Composed of 5-Ft. Segments, the First Section Beginning 120 Ft. from the Surface

By Alphonse F. Brosky,*
Pittsburgh, Pa

OPERATIONS at Leisenring No. 1 shaft of the H. C. Frick Coke Co. began back in the early eighties. The shaft is located in the coke region, three miles southwest of Connellsville, Pa. When the sinking was made the field, though not exactly in its infancy, had not been much mined, so that this operation was one of the pioneers in that locality.

Nor has mining at any time since been prosecuted intensively. The beehive ovens at no time have demanded nearly as much coal as the region could produce. As most of the mines in this field served a limited number of beehive ovens it is little wonder that their average life has been greater than that of mines in other fields. The thickness of the coal measure being worked also has been a factor in the longevity of these operations. The Pittsburgh bed attains in many places in this region a thickness of 9 ft.

An airshaft was sunk at Leisenring No. 1 several hundred yards south of the hoisting shaft, the thickness of the overburden exceeding 400 ft. At the time that this shaft was sunk the industry had not made extensive use of concrete, the real advances in the use of this material having been made within the last decade. What the cross-sectional dimensions of this airshaft were at the time of sinking cannot be judged by its measurements today. During the thirty-five or more years that have elapsed since the completion of this opening its sides have stood without a permanent supporting lining. At intervals during this period more or less timber has been placed, but timbering at its best does not assure that a shaft sunk through sedimentary measures will retain perfect alignment.

WATER DIFFICULTIES IN UPPER SIXTY FEET

The strata penetrated consist of shales, clays, sandstones, several extremely thin coal seams and some limestones. For the first 60 ft. downward from the surface, as shown in Figs. 3 and 4, shales preponderate, with occasional strata of other rocks at intervals. It was in this section that most of the troubles arose. Water flowed from the bedding planes of the strata in great quantity, and as it is practically impossible to prevent the air from circulating behind a wooden shaft lining, the soft formations underwent a more or less rapid disintegration. The water, acting as a transporting agent, removed the crumbled mineral, forming voids, and it was thus impossible to keep the shaft in line.

Below the 60-ft. level little water is found and the rocks are firmer. But at intervals softer strata such as clays and shales occur, and these required support. It was realized that the physical conditions in and about the shaft might finally reach such a state as to become hazardous. The timbering remained well preserved in the extremely wet atmosphere, but it would not "stay put." Weathering of the rock in the unprotected sections caused falls, so that the shaft walls became extremely irregular, and six years ago the upper 60-ft. section was retimbered.

A 20-ft. fan, operated as a blower, supplies air for mine ventilation. The shaft is, therefore, a downcast. Originally enough air traveled through this shaft to insure good ventilation. As the workings were being extended, however, the company foresaw the need of a greater air supply and determined to effect the desired result by lessening the resistance which the downcast offered to the passage of the ventilating current. It also was deemed advisable to shut off the water which found its way into this shaft, as the accumulation of ice in the winter appreciably obstructed the passage of air.

The lining of the shaft was therefore started in the summer of 1921 and was completed in November of the same year. No steel entered into this construction, concrete being used for the lining and wood for the stairway. Past experiences showed clearly the superiority of wood over steel for this purpose. Steel corrodes in a comparatively short time, whereas wood has been removed in a perfect state of preservation after as many as forty years of service.

The work of lining the shaft was done by the company, under the supervision of Stephen Brindlinger, who has had many years of experience in this kind of work and who has been in the company's employ for forty-three years. His wide experience had given him an intimate knowledge of the formations with which he had to deal. It is interesting to note the sequence of operations followed and the novel schemes employed in this

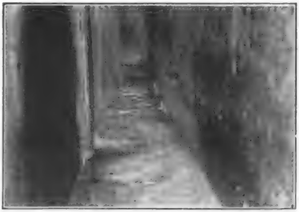

FIG. 1. VIEW OF WATER RING WITH WATER FALLING FROM TERRA-COTTA PIPES ABOVE

By keeping this water out of the shaft ice does not form in the winter months. The ring is sufficiently large that it can be entered and the pipes cleaned out should any become clogged.

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*Bituminous Editor, *Coal Age*.

undertaking. That the work was well done is attested by the condition of the finished shaft as it stands today. The work unquestionably was dangerous, yet not a single accident occurred.

It might be well to describe first the surface operations, including the handling of materials, the bucket arrangement and the like. While the lining was being constructed the fan was kept running continuously in order to maintain the ventilation of the mine. A double trap door was set in the roof of the fan casing directly over the center of the shaft proper, around which a platform was erected. This served as a landing for the bucket when brought to the surface. In a temporary hoist house, about 50 ft. from the shaft, a steam-driven Lambert friction hoist of the two-drum reversible type was placed.

The drums of this machine carried ¾-in. non-spinning steel cable. To the cable from one drum was attached the bucket and a swinging platform was suspended from the other cable. A spool, or "nigger-head," was fastened to the main shaft of this machine and was used for pulling 3-ton supply cars up a narrow-gage track from the railroad siding.

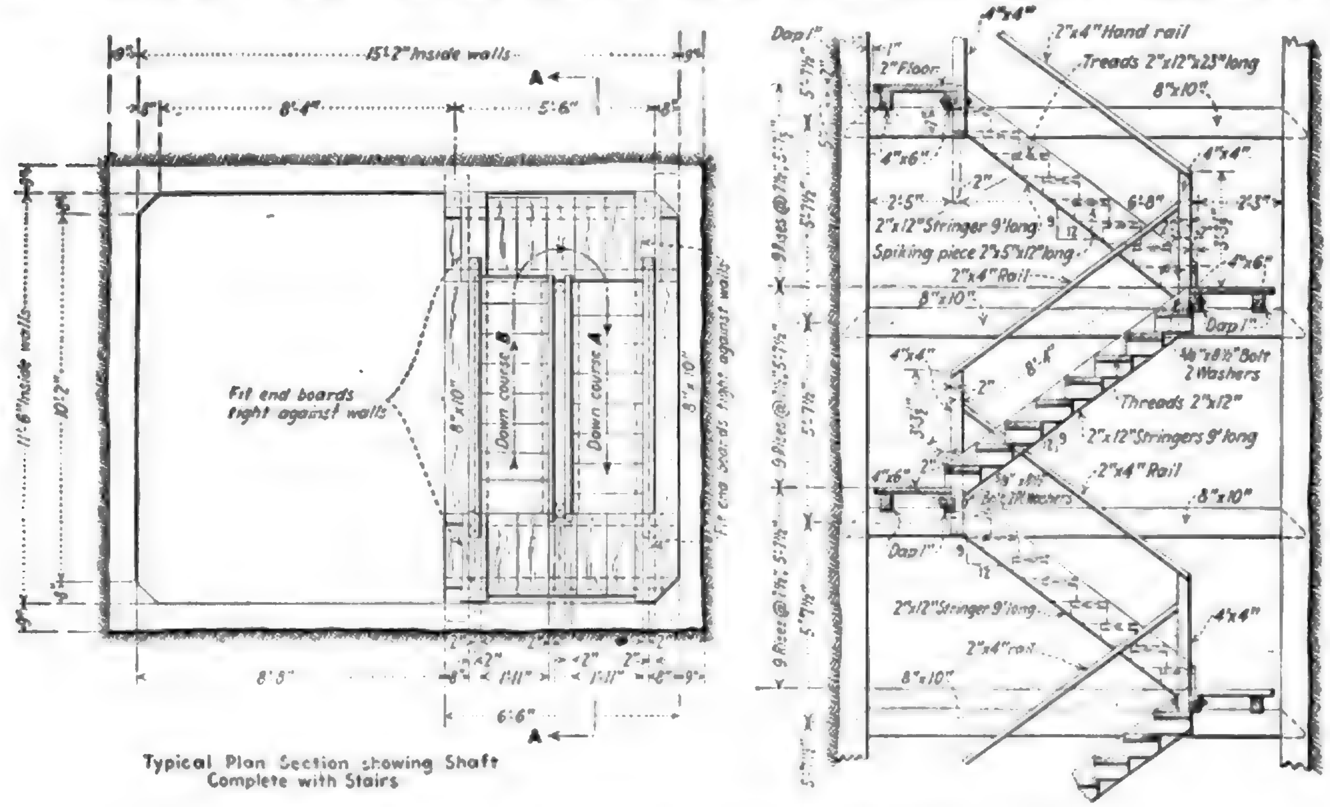
The trap door on the roof of the casing was opened only when material was raised from or lowered into the shaft. None of the concrete, however, passed through this opening, as will be seen later. In straightening the walls of the shaft much protruding rock was shot down. This fell onto the working platform, was loaded into the bucket and lifted to the surface through the door. Here the bucket was swung over the outside platform and the rock dumped into a chute leading to a rock pile, or, in case the removed material was not suitable for backfilling between the shaft lining and the wall rock, it was loaded into wagons and hauled away. The working platform mentioned was of the grate type, with a ratio of open space to solid sufficiently large to permit the passage of enough air for mine ventilation.

A concrete mixer was located close to the fan housing. A gated chute pierced the foundation wall of the fan casing, connecting the mixer with the shaft landing inside. This landing afforded ample working space for the loading of concrete. The bucket, on being raised to this point, was swung over the landing and under the discharge of the chute. The gate was then opened and the bucket filled.

The cable carrying the bucket passed over the sheave of a boom extending over the trap door, and that leading to the swinging platform pierced the foundation wall and passed down the shaft to one side of the bucket cable. Four corner ropes attached this cable to the platform which was used solely for cutting hitchings in the shaft lining to receive the wooden beams which support the stairs.

As mentioned before, the first 60 ft. of the shaft had been timbered some years ago. Thus the most dangerous section, being near the surface and water bearing, was well supported. Concrete lining in a shaft usually is started at the bottom. In deep shafts, however, this practice results in much lost time occasioned by raising and lowering men to and from the surface while blasting. In lining this shaft, work did not commence at its foot but at a point 120 ft. from the surface. The lining was carried up to the section that was lined already with wood, and then stopped.

Upon completion of this portion of the shaft, construction of the stairway began at the 120-ft. elevation



Typical Plan Section showing Shaft Complete with Stairs

Section A-A

FIG. 2. PLAN OF SHAFT WITH ELEVATION OF STAIRWAY

This shaft is lined with concrete without the use of reinforcement, and the stairway is of wood. The air in the shaft is downcast and, therefore, free from fungus germs. The purpose of the lining in the main ring is not for strength but to preserve the measures against deterioration and to keep the shaft dry. The measures have stood fairly well for years without protection except in the first 60-ft. section.

and was carried upward. Immediately after the concrete lining was completed up to the lower end of the wooden lining, 60 ft. from the surface, concreting was started at a point approximately 180 ft. below the ground level.

The schedule followed then was to finish the lining of one 60-ft. section, working upward, and then start another 60 ft. below the completed one. This procedure continued until the entire shaft had been lined. The upper 60-ft. section was completed last. It will be noted that the elevations are given as if they were reckoned downward from the surface.

Work Downward and Thus Escape Rock Falls

By following this schedule in the lining of the shaft much time was saved. It facilitated the carrying on of dual operations, namely, the building of the stairway and the pouring of the concrete lining. In trimming the wall rock, preparatory to placing the lining, a number of light blasts were required. If the operation had begun at the bottom and proceeded continuously upward, one may easily realize how much time would have been lost in raising and lowering men to and from the surface. In this case, however, it was necessary to raise them a distance of only 60 ft. or less before blasting.

Aside from the time thus saved this method had another marked advantage in that the men, well aware that a safety haven lay only a short distance above them, naturally worked with greater confidence. Also at all times a minimum length of exposed and unsupported rock was overhead. If the lining had started at the bottom, temporary timbering throughout the entire depth of the shaft would have been required for safety, previous to the lining operation proper. Such timbering would have complicated the work needlessly.

The method described not only was speedy but appreciably reduced the cost of the lining. The time required to complete the work was less than that estimated, and the actual expense was much lower than had at first been deemed necessary.

Masonry Collar of Shaft Not Disturbed

As completed the shaft is a little over 400 ft. in depth, with inside dimensions 11 ft. 6 in. x 15 ft. 2 in. When the shaft was sunk a masonry collar had been built at the mouth of the shaft. This served as a foundation for the fan, and in the relining of the shaft it was left in place. The minimum thickness of the lining is about 9 in. though in many places the concrete is two or more feet thick. These excessive thicknesses were poured at the points where extremely soft strata, with resulting voids, were encountered, the lining as a rule being carried to the solid. It was poured in 5-ft. sections and in the entire work 1,000 tons of gravel, 500 tons of sand and 5,400 sacks of cement were used in a 1:2:4 mix. The capacity of the bucket was ½ cu.yd.

Some of the provisions for drainage of this shaft are unusual but efficient. The shaft itself is dry, no seepage occurring through the lining. Sweat, however, is found on the walls as in all fresh-air shafts, the moisture in the atmosphere condensing on the cold surfaces. Water coming from the rock behind the lining is caught in water rings and pipes, and is discharged into the sump at the bottom through a 6-in. wrought-iron pipe. The quantity of this water is estimated as the equivalent of a 4-in. stream running continuously.

The method of draining, including the arrangement of the water-spaces, rings and pipes, is shown in Fig. 3. This covers only the upper 60-ft. section, below which little water occurs. In the lower portions small wooden boxings inserted in the concrete draw off the water. These are drained through 2-in. wrought-iron pipes, and empty into the 6-in. pipe extending from the main water ring at the 60-ft. level to the bottom of the shaft.

From the brink of the shaft to the 35-ft. level where a large water space is located, four 4-in. terra-cotta pipes in 2-ft. lengths are embedded in the concrete, one being placed in each wall. In this way the water accumulating in the small water spaces above the 35-ft. level is removed. Between the 40- and 45-ft. levels water pours down in sheets. The stratum between these two levels is a sandstone, accounting for the large volume of water. It will be noted, referring to Fig. 3, that the open space behind the lining is 10 ft. in height. Three doors have been built into the lining at this point. This provision will permit a man to enter the water ring and pass completely around the shaft, removing any and all material likely to collect and hamper drainage. The lower 5 ft. of the ring is not entirely open.

Vertical slabs placed at intervals give the necessary rigidity to the lining at this point, and form sinks or sumps, from which twelve terra-cotta pipes lead to the main water ring below. It is on top of these slabs that a man

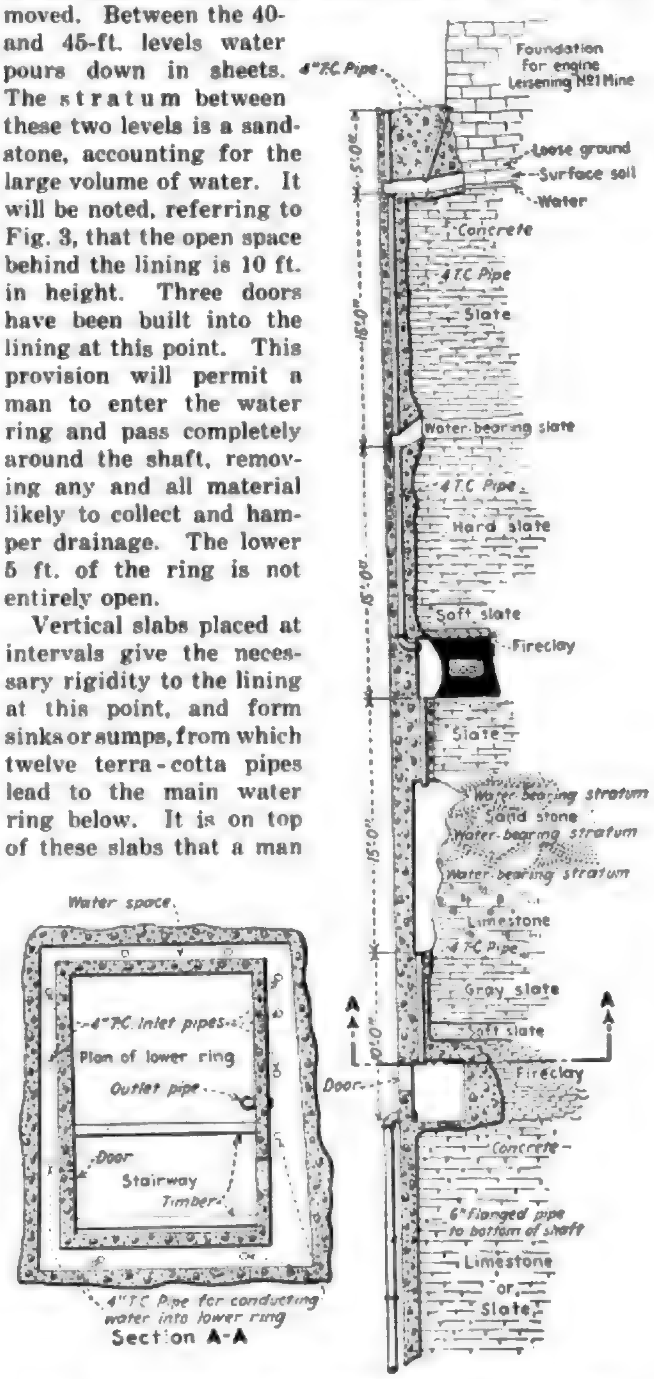


FIG. 3. VERTICAL SECTION OF ONE WALL OF SHAFT

This shows the top section of the shaft, which, having many water-bearing strata, had been well timbered within a few years. This section was the last to be concreted, work being commenced in the section just below it and then being continued downward by successive lengths of 60 ft., each of which was worked upward from its lower end. Finally the section shown was built. Section AA shows a plan of the main water ring to which twelve 4-in. pipes bring the water collected from the strata above.

gets his footing in traveling around the shaft lining. The surface of the sandstone wall rock was sprinkled with cement to minimize disintegration. Should the terra-cotta pipes in the upper sections become clogged, the water in the spaces and rings may be tapped by pipes placed in holes which may be drilled through the lining. Between the levels of 55 and 50 ft. the main water ring is located. Into this all the water from above discharges. As shown in Fig. 3, no rock is exposed at this level, the strata being concreted on all sides. The measure at this point is a fireclay. Years ago a water-ring sump was located at this level, into which drained the water from two rings above. A pump was installed adjacent to this ring and the water was raised to the surface, where it was used in the boiler room and for the quenching of coke. From the present ring the water discharges into a 6-in. wrought-iron pipe, which carries it to the sump on the bottom. In the work of lining this shaft two 8-hour shifts were maintained, one crew working from 6 a.m. to 2 p.m. and the other from 2 p.m. till 10 p.m. Each crew was composed of six men, who were assisted by an engineer and two top tenders. These latter mixed the concrete and performed other tasks on the surface. During the hours when concrete was being poured two members of the shaft crew attended to the loading of the bucket. Only two carpenters working on a 9-hour shift were needed on this job. The schedule of operation was such as to permit most of the concrete mixing and pouring to be done during daylight hours. The plan followed and the care and diligence exercised by those in charge resulted in the immunity from accident already noted.

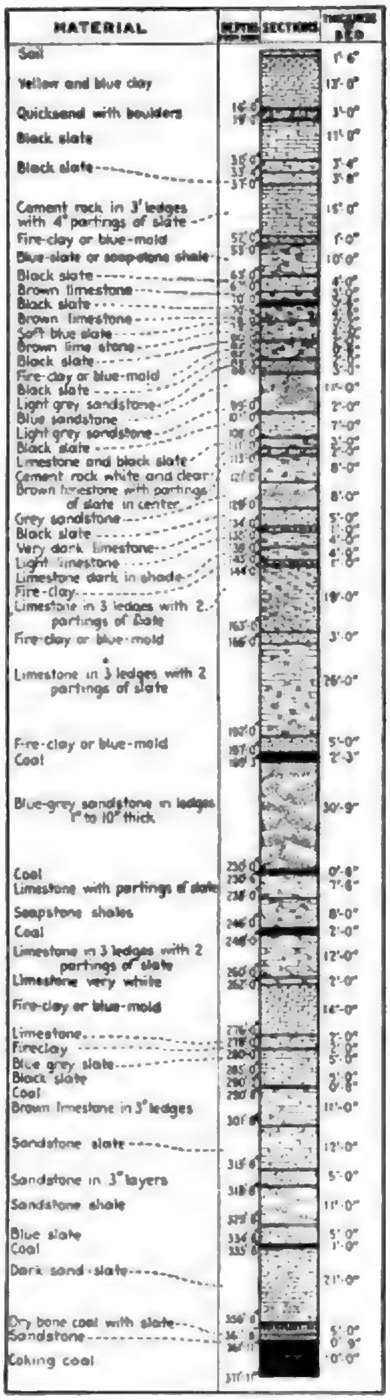

MATERIAL
SECTIONS
Soil
Yellow and blue clay
Quicksand with boulders
Black slate
Black slate
Cement rock in 3' ledges with 4" partings of slate
Fire-clay or blue-mold
Blue-slate or soap-stone shale
Black slate
Brown limestone
Black slate
Brown limestone
Soft blue slate
Brown lime stone
Black slate
Fire-clay or blue-mold
Black slate
Light grey sandstone
Blue sandstone
Light grey sandstone
Black slate
Limestone and black slate
Cement rock white and clear
Brown limestone with partings of slate in center
Grey sandstone
Black slate
Very dark limestone
Light limestone
Limestone dark in shade
Fire-clay
Limestone in 3 ledges with 2 partings of slate
Fire-clay or blue-mold
Limestone in 3 ledges with 2 partings of slate
Fire-clay or blue-mold
Coal
Blue-grey sandstone in ledges 1" to 10" thick
Coal
Limestone with partings of slate
Soapstone shales
Coal
Limestone in 3 ledges with 2 partings of slate
Limestone very white
Fire-clay or blue-mold
Limestone
Fireclay
Blue grey slate
Black slate
Coal
Brown limestone in 3" ledges
Sandstone slate
Sandstone in 3" layers
Sandstone shale
Blue slate
Coal
Dark sand slate
Dry bone coal with slate
Sandstone
Coking coal

FIG. 4. SECTION OF STRATA IN SHAFT

The upper part of the cement rock under the black slate is full of water and gave much trouble. The lining is built well within the strata at this point so as to give full opportunity for the water to escape.

Geological Survey Reports and Investigations

North Carolina Has a Small Field of High-Grade Triassic Coal

A TRACT of land containing not less than fifteen million tons of excellent steam and coking coal has been outlined by mines and drillholes in the Deep River coal field of North Carolina. It is estimated also that in the remainder of the field at least 60 million tons is available at depths not exceeding 1,500 ft.

These figures are the result of a recent examination made by Marius R. Campbell under the joint auspices of the U. S. Geological Survey and the North Carolina State Geological Survey. The northwestern side of the Triassic basin, in Lee, Chatham and Moore counties, is underlaid with a coal bed of workable thickness and quality. Measurements of this bed in the mines at Cumnock and Farmville, on the outcrop at Gulf and Haw Branch, and in boreholes within the basin show that its thickness ranges from 40 to 50 in. along the outcrop for a distance of about twelve miles as well as into the basin from the outcrop for a distance of one and one-half to three and one-half miles, where it passes below a depth of 1,500 ft., which is now considered the limit of workability. If it should be found that mining can be carried to a greater depth, a much larger quantity than that stated above would be available.

The coal bed is remarkably regular in thickness and composition. It contains no partings, but in places carries a narrow band of bone at the bottom. The roof is a thick bed of hard sandstone underlaid by 2 to 10 in. of "draw slate," which usually falls some time after the coal has been removed. The floor is equally hard, being composed of "black band," or carbonate of iron. This provides an excellent foundation for tracks and other equipment within the mines.

The rocks of the basin are in many places cut by dikes of igneous rock, which cause much trouble and expense in mining. These dikes were once regarded as insurmountable, but by driving the entry through them to the farther side, the coal bed in every instance will be found nearly undisturbed. A few faults, which offset the bed from a few inches to many feet, have been encountered. These, however, appear to be most abundant on the margins of the field; few are found in the deeper parts of the basin.

On the northwest side of the field the coal bed dips into the basin at angles ranging from 20 to 25 deg., but at a depth of a few hundred feet the inclination generally flattens toward the southeast. At Farmville the dip along the axis of the basin is only 4 to 5 deg. The coal bed carries little water, so that even in the Cumnock mine, which lies close to Deep River and below its level, the rooms and entries are so dry that it is necessary to sprinkle them occasionally.

The coal is moderately low in ash, which probably does not average over 8 per cent. Judging by its appearance where it is cut by dikes, it will make good coke. It would be an excellent domestic fuel were not its cleavage so highly developed. When mined, most of it breaks up into small fragments, only a small percentage being lump.

Old Anthracite Mine Electrified Without Replacing Any Part of Equipment Adaptable to New Power

Steam Operation of a Mine Almost Sixty Years Old Became Too Expensive to Be Continued—Plant Accordingly Was Electrified, as Large a Portion of the Old Machines as Possible Being Retained

BY W. H. LESSER*
Frackville, Pa.

AMONG the nine anthracite operations owned by Madeira, Hill & Co., with general offices in Philadelphia, Pa., is the Kehley's Run Mine of the Thomas Colliery Co. This mine is located in Shenandoah, Pa., and is leased from the Girard Estate. It has been producing coal since 1865, during which year it shipped about 2,400 tons. Records show that up until the end of December, 1921, 7,248,945 tons of coal had been shipped from this property. The peak of production has long been passed, but a large tonnage remains, which is, however, mined at much expense. At present the output is 18,000 tons per month.

Decision to completely electrify the plant was made after a thorough investigation of the relative cost of operation with steam and electricity. The limited daily tonnage and the high royalty (in excess of $1 per ton on all sizes) exacted by the lessor also were factors taken into consideration. It was realized that the remaining tonnage must be won at a lower cost for power than was possible with a steam plant, which was just as expensive to operate when producing the present tonnage as when the output was at its maximum.

Steam required to operate the plant was produced in a boiler installation containing twelve hand-fired horizontal return-tubular boilers the ages of which were such that it would have been necessary to replace them in the near future. The engines and pumps were of an ancient design with a rate of steam consumption far above that obtained in the modern steam engine. This is a condition not at all uncommon about mines. The steam-producing and consuming equipment as a whole was not of a type that would develop power at a low cost.

Investigation showed that to electrify the plant about 1,900 hp. would be needed. In introducing the motors plans were laid so that as much of each of the old steam-driven machines would be used as existing conditions would permit. As a result of the decision not a single complete electric hoist was purchased. Consequently an appreciable saving was made in the cost of electrification.

Electric energy was obtained from the Pennsylvania Power & Light Co. through its substation at Shenandoah. It is supplied to the colliery at 4,000 volts, 3-phase, 60-cycles. An outdoor substation of the pole type, as shown in Fig. 1, reduces the incoming potential to 440 volts. The high-tension line has been extended to Slopes Nos. 3 and 5, where small substations were built to handle the load at those points. The main substation contains three 333-kva. single-phase transformers with standard outdoor substation units provided with choke coils, lightning arresters and fuses. A recording voltmeter is installed on the high-tension side of the substation in order to keep a record of the voltage delivered by the power company.

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*Mechanical engineer, Thomas Colliery Co.

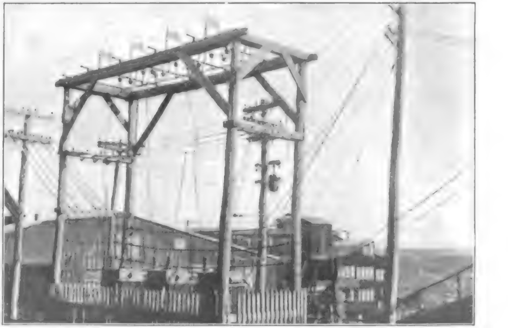


FIG. 1.

Cutdoor Substation

At the Kehley's Run Mine of the Thomas Colliery Co. Electric current is supplied by the Pennsylvania Power & Light Co. at 4,000 volts, 3 phase, 60 cycles and stepped down by three 333-kva. single-phase transformers to 440 volts. The substation has choke coils, lightning arresters and fuses and a voltmeter to record the voltage of the incoming high-tension current. However, this is the principal substation. The high-tension line has been extended also to two other slopes and smaller substations have been erected to handle the loads at those points.

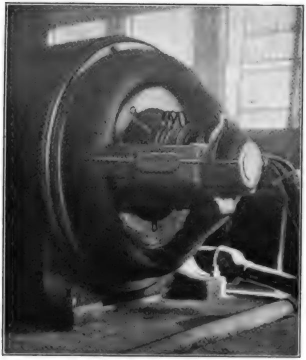


FIG. 2. MAIN-SLOPE HOIST MOTOR

The hoist raises an unbalanced load of 48 tons on a 58-deg. pitch at a full-load speed of 760 ft. per minute. The motor is of 350 hp.

Each motor installation is supplied with power through disconnecting switches, choke coils, lightning arresters and an oil switch equipped with overload and no-voltage releases. The power requirements on the surface include hoisting, conveying, breaker, ventilating and pumping operations. The main slope hoist, as shown in Fig. 2, is operated by a 350-hp. motor. It is calculated to raise an unbalanced load of 9,600 lb. on a 58-deg. pitch at a full-load speed of 760 ft. per minute.

The layout of this machine, as shown in Fig. 4, required in addition to the motor the purchase of a shaft, a drum pinion, a set of herringbone gears, a set of pedestals and a flexible coupling. The drum and drum shaft as well as the overwinding devices used on the steam hoist were utilized in the electrified machine. A limit switch attached to the drum shaft reduces the hoisting speed automatically near the end of the hoist cycle, stops the motor and applies the brake in case of an overwind. An electrically operated air compressor furnishes the air required to operate the brakes, using the original steam-actuated brake cylinders. This machine is controlled by means of a contactor-panel switchboard operated by a master controller, as shown in Fig. 3.

Two other hoists were equipped, one with a 150-hp. and the other with a 100-hp. motor. They were rebuilt on the same lines as the main-slope machine, each utilizing as much of the old equipment as possible. A 12-ft. mine fan was equipped with a 25-hp. slip-ring motor and driven through a silent chain inclosed in a dustproof casing. A slip-ring was selected in preference to a squirrel-cage motor because of the high starting torque necessary to bring a fan of this size up to speed. The breaker machinery is driven by two motors, one of 250 and one of 100 hp. Each motor is controlled from a central point, a distance of 200 ft. separating them.

Water is supplied to the breaker by a two-stage centrifugal pump and a 10 x 36-in. reciprocating pump driven by a motor through a pair of gears and a belt. The latter was converted from a steam-driven machine. This is an emergency installation that has proved itself highly satisfactory for handling water containing a large quantity of coal in suspension.

The main pumping plant employed for mine drainage consists of three centrifugal pumps with a combined capacity of 3,000 gallons per minute against a head of 350 ft. Each of these machines is driven by a 150-hp. squirrel-cage motor controlled from a slate-panel board on which are mounted an ammeter and a voltmeter. A small reciprocating pump driven by a 5-hp. motor is successfully used for priming these machines.

Since electricity has been employed it has been possible to improve the mine-haulage system by the installation of two storage-battery locomotives. These are charged by an automatic charging set, a motor-generator being used to produce direct current for this purpose.

The complete list of motors and their application is shown in Table I.

TABLE I. MOTORS EMPLOYED IN ELECTRIFYING PLANT

Service	Horsepower	Service	Horsepower
Hoists		*Pumps*	
For main slope	350	For breaker	two of 75
For Buck Mountain slope	150	For mine	three of 150
For supply plane	50	For Buck Mountain slope	75
For rock conveyor	100	For priming pumps	one of 2 and one of 5
For Skidmore	35	*Compressors*	
For No. 5 slope hoist	25	For slope	25
Motors		For portable air compressor	38
For breaker	one of 100 and one of 250	*Motor-Generator*	
For cleaner	50	One set	50
For conveyor	75	*Fan*	
For shop	22	One mine fan	25

When the plant was operated by steam fourteen men were required in and about the boiler plant, and the furnaces consumed 2,400 tons of boiler fuel per month, consisting of a mixture of 50 per cent rice and 50 per cent barley coal. At the present time an average of 240,000 kw.-hr. is used per month, which represents a consumption of approximately 600 tons of fuel in the central power plant.

Elimination of boilers from the colliery removed a class of labor that is difficult to retain and handle on account of the exacting nature of the work of hand-firing furnaces. The installation of the electric drive improved the operation of the breaker machinery, because

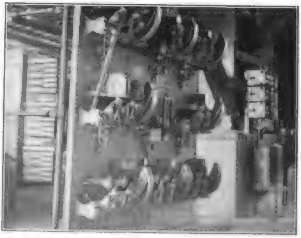


FIG. 3 CONTACTOR-PANEL SWITCHBOARD AND MASTER CONTROLLER

This is the electrical apparatus for the handling of the main-slope hoist

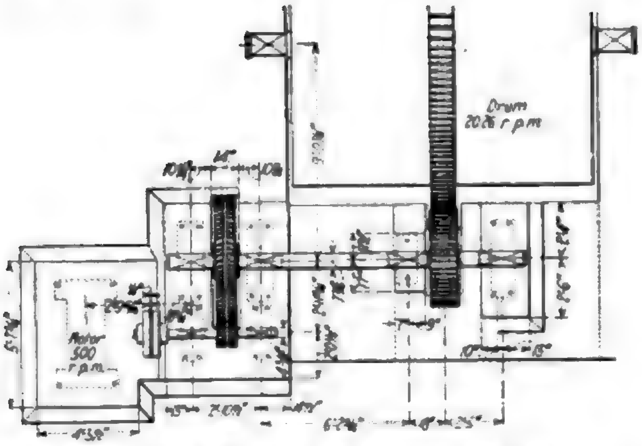


FIG. 4. MOTOR DRIVE OF MAIN-SLOPE HOIST

As the motor runs at 500 r.p.m. the speed is reduced by two reduction gears, a plain gear at the drum with a ratio of 3.75 and a herringbone gear at the motor with a ratio of 6.57, a total reduction of 24.64.

the motors maintained a more constant speed than the steam engines they replaced, uniform steam pressure having been maintained with difficulty, especially during the winter months.

The men who were accustomed to operating steam engines and pumps seemed to have no difficulty in grasping the principles involved in handling the new power. During any future suspension of the mine the working force may be reduced to a minimum, as the pumpers are the only men who will have to be kept at work. Generally speaking the operation of the plant electrically since the completion of the necessary alterations in December, 1919, has been satisfactory in every respect.

Mine-Type Telephones Unsafe in Gas[*]

By L. C. Ilsley[†]

A PRELIMINARY investigation has recently been made by the U. S. Bureau of Mines to determine whether the ordinary mine-type telephone is entirely safe in gaseous atmospheres. Two well-known makes of mine-type phones were purchased for this investigation (A and B).

It is not conceivable that the current necessary for talking over telephones could ignite gas. However, such phones are provided with efficient magnetos, and it was believed that danger might result from the ringing of the magneto. Again, while this type of phone has been designed to have a certain measure of dust and moisture tightness, evidently it has not been designed as an explosion-proof device, either with regard to cover joints and fastenings or strength of castings. Therefore the problem was simplified. First it was assumed that, owing to the construction of the telephones, the gas would penetrate into their interior, and the question was merely whether the gas would be ignited from the operation of the magneto.

The telephone under investigation was placed in a large testing gallery of approximately 400 cu.ft. capacity, used by the bureau for investigation of all types of electrical equipment in gaseous atmospheres. The gallery is so arranged that it can be filled with an explosive mixture of natural gas and air.

The inner and outer doors of this telephone were left open, so that the gas could easily enter the interior of the telephone. The other telephone was placed at a point some distance from the gallery, and connected to the first telephone through a metallic circuit. In series with this circuit was a non-inductive resistance, equivalent to a double circuit of No. 18 A. W. G. copper wire, one mile in length. The telephone inside the gallery was fitted with an attachment which permitted the ringer to be operated from outside the gallery. By another attachment the receiver circuit could be opened or closed in like manner.

Tests were made by ringing the telephone inside the gallery when filled with gas, but not connected to the external circuit; by ringing the inside telephone when connected to the external circuit, and by ringing the outside telephone while the receiver circuit of the inside telephone was being opened and closed.

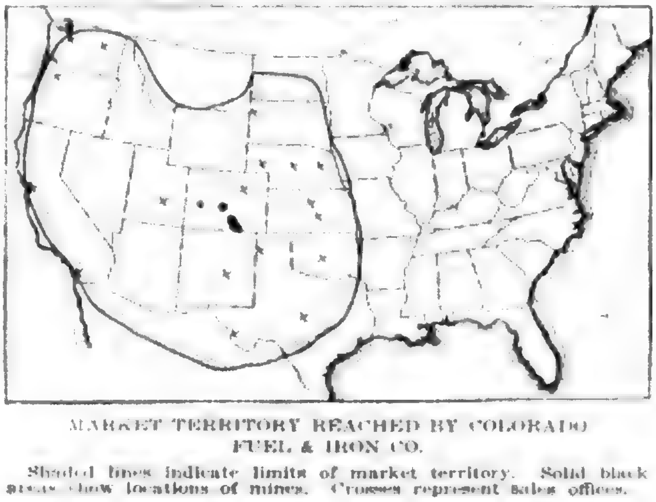
Several series of trials were made with telephone A not connected to the external circuit, resulting in two explosions, one at the first turn of the crank and one after about one minute. Several series of trials were made with telephone A connected to the external circuit while the ringer of the telephone under test was being operated, resulting in one explosion. A series of trials was made by ringing the outside telephone A while the receiver circuit of the inside telephone A was being opened and closed, resulting in an explosion.

Two series of trials were made with telephone B not connected to the external circuit, resulting in two explosions, one taking place at the first turn of the ringer. A series of trials was made with telephone B connected to the external circuit, resulting in an explosion after the third ring on the inside 'phone. A series of trials was made by ringing the outside telephone B while the receiver circuit of the inside telephone B was being opened and closed, resulting in an explosion.

The investigation indicates that the ordinary type of mine telephone is not safe in gaseous atmospheres and that there is need of a schedule which shall outline the requirements for telephones that may be called upon to operate under such conditions.

Colorado Fuel & Iron Co. Has Wide Market

THE accompanying map, prepared from data submitted to *Coal Age* by the Colorado Fuel & Iron Co., gives a picture of the wide territory reached by the coal mined by that company. All its mines are in Colorado, in the Canon City, Walsenburg and Huerfano fields on the bank of the Rockies and at Crested Butte on the west slope. The company maintains 18 coal sales offices in 11 states for the distribution of both steam and domestic coal.



MARKET TERRITORY REACHED BY COLORADO FUEL & IRON CO.

Shaded lines indicate limits of market territory. Solid black areas show locations of mines. Crosses represent sales offices.

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[*] From Reports of Investigations, Bureau of Mines, Serial No. 2308.

[†] Electrical engineer, Bureau of Mines.

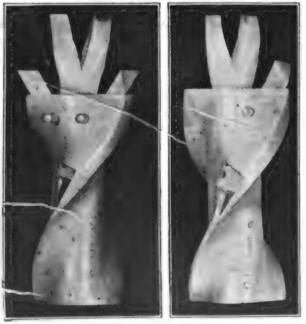
Eliminating Danger of the Small Shothole

A PROLIFIC source of danger in the use of explosives at coal mines is the shothole that has been drilled to a diameter smaller than that of the cartridge. Many a miner, having made such a hole, will attempt to force the cartridge home with a tamping bar, a premature explosion not infrequently resulting.

Shotholes are drilled for the most part with a coal auger which consists ordinarily of a helix somewhat smaller than the hole to be bored, on the end of which is a cutting point of either drill or fishtail shape the width of which determines the diameter of the finished hole. Any wear on the point of the auger thus decreases the size of the hole drilled. In consequence drills must be kept to gage if this danger is to be avoided.

To obviate this difficulty and to render sharpening of the drill a comparatively easy operation, George Chismer, of Kingston, Pa., a miner of many years' experience has invented the drill shown in the accompanying illustrations. The type intended for use in coal is made with a helix 2¼ in. in diameter, and the diameter of the helix for the drill made for boring rock is 1¾ in., these being usual sizes for cartridges in anthracite mines. With auger bodies of these sizes the holes made must necessarily be somewhat larger. This assures that the charge of explosive can be pushed home with ease and that in so doing the cartridge will not be deformed or crushed, which might cause a premature detonation of the explosive.

Drills intended for use in coal are fitted with one side cutter while those designed for rock have two. All cutters, whether side or center, are readily removable, being held in place by steel pins of standard size and taper that fit into a notch in the bit steel and so are quickly driven to place. This permits the bits to be taken out and sharpened, with a file or on an emery wheel. As the bits wear they may be moved outward a notch at a time. The helix of this drill is a steel casting and the bits are of tool-steel. These latter, therefore, may be given any temper desired. Furthermore the cutters are set within the helix and are largely supported thereby. Pressure exerted upon them while boring consequently is more longitudinal than transverse, and danger of breakage is thus lessened.



DRILL POINT WITH EASILY-DETACHABLE BITS

Knocking out one or two standard taper pins, as the case may be, allows the bits to be withdrawn for sharpening or adjustment. Inserting the pins locks the bits in place.

A drill of this kind needs no gaging—the bits in every instance must cut the material drilled to a sufficient diameter or the drill will not work at all. At present it is being made only for use with a post mounting, though no obstacle would appear to its being used as a breast auger or with an electric drill. It is adapted to any rotative machine but not to one that is percussive or that combines concussion with rotation.

New Induction Motors for Old

EXPERIENCE has proved that burned-out or worn rotors of induction machines can be repaired by the aid of the welding torch. It is claimed that by proper welding, repairs to such motors can be made permanent and that machines of earlier types can be rendered equal in efficiency to those of later design.

The rotor bars in the old-type motors are heavy conductors embedded in laminated cores and short-circuited on the ends by means of brass, bronze or copper rings. The bars, or conductors, usually are attached to the resisting rings by means of rivets, screws, bolts or solder. It is obvious that such connections will work loose under constant vibration or as the result of expansion and contraction, and when this occurs it will decrease the positiveness of the contacts. So long as they are comparatively new such motors function satisfactorily under ordinary working conditions, but trouble is almost sure to develop after they have been in long use or subjected to severe service. The usual way of repairing a burned-out or dragging machine is to remove the bars and rings of the rotor and replace them with new parts of identical construction. This virtually renews the motor, but does not obviate the difficulty.

A quick and much more satisfactory repair, according to reports from J. Otis Crawford, of El Paso, Tex., is to make permanent contacts by means of the oxy-acetylene welding torch. This can be done, it is asserted, at approximately the same cost as would be entailed by the old method of reconditioning. The chief advantages of the autogenous weld over the old method lie in the shorter time required and in the permanence and serviceability of the repair.

Motors of 5, 10, 20, 50, 90 and 150 hp. have been reclaimed in this manner, the procedure being as follows: The rotors are removed from the stators and placed in a lathe so that the bar ends can be beveled to an angle of 45 deg., starting from the ring surface. The metal removed is then replaced by a ring of the best Tobin bronze welding rod, properly fluxed and welded into place with the welding torch. When this operation has been completed and the work has time to cool, the rotor is again placed in the lathe and the work finished.

During the past year between thirty and forty motors have been reconditioned by the welding process, and it is said that there has not been a single failure in the lot. It is therefore believed that the welding torch will make possible the saving of many motors now operating in mines and industrial plants that otherwise would sooner or later have to be scrapped or reconditioned at such frequent intervals as to render them of little value in a modern installation.

Synchronous Motors Reduce Mine-Fan Power Bills[*]

Low Starting and Pull-In Torques of Synchronous Motors Long Prohibit Their Use for Driving Mine Fans—Closing Chimney During Start or Installing Suitable Clutch Between Fan and Motor Obviates Difficulty

BY FRANK W. CRAMER[†] AND A. A. MACDONALD[‡]

MUCH has been printed concerning the replacement of the steam engine by the electric motor. It has been proved repeatedly that the electric drive eliminates the inefficient boiler house used at the small installation, that it is more economical and requires fewer men to operate, that it has the advantage of cleanliness and in most cases is cheaper to install.

At coal mines the large units such as hoists, air compressors, pumps and direct-current generators, are quite frequently driven by steam engines. Few of them are so large that the installation of turbo-generators to furnish electric power is justified, and when they are large enough to make such equipment desirable, the water supply is such as to make it impossible to use condensers. The best solution of the difficulty is, therefore, to purchase energy from some central station.

Public-service corporations fortunately have made mine electrification possible. Their power lines are now available in every mining section of Pennsylvania, and the rates charged are such that electrification results in appreciable saving.

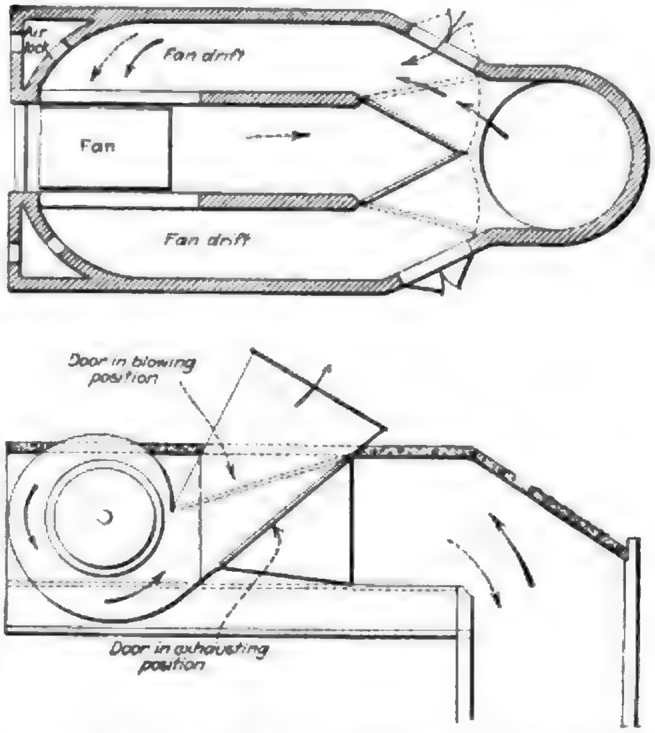
A brief history and description of the mines with which this paper deals may be of interest. Just prior to the war the Midvale Steel & Ordnance Co. acquired the Marianna, Acme and Hazel Kirk mines from the Pittsburgh-Buffalo Coal Co. and the Pittsburgh-Westmoreland Coal Co. The Marianna mine was opened some fifteen years ago, and at that time it was considered a model. The mines of the Pittsburgh-Westmoreland group were opened as small independent operations, being later acquired by the above-named company. Each of these plants was equipped with direct-current engine-driven generators that supplied power for haulage, small pumps and lights. All the large drives were by steam engine.

OLD PLANTS WERE WASTEFUL AND INEFFICIENT

Soon after these properties were acquired it became apparent that the power costs, both steam and electric, were excessive, in fact an average for all the plants was about 2.6c. per kilowatt-hour of reasonable work done. A careful study revealed that the boiler plants themselves were highly inefficient and wasteful. Steam for the engines was conveyed long distances, with consequent heavy losses, and with the failing efficiency of labor during the boom war times, about the same number of men were required in the no-load as in the peak hours.

This difficulty could be corrected in either one of two ways. The first was the construction of a modern central station at Marianna to supply power for that mine and for any future developments necessary to operate the coal holdings tributary thereto, which lie to the southwest of the present opening. To supply the Acme and Hazel Kirk operations from this station would have required the building of about twelve miles of transmission line. One condition adverse to this scheme was the all too common failing of inland mining regions—namely, an insufficient water supply. Another determining factor was the difficulty experienced during boom times in attracting and retaining in a mining town the class of labor neecssary for work of this kind.

The second course of procedure was the purchase of power. After much thought it was finally decided that the service offered by the West Penn Power Co. would in the end afford the better solution. The reliability of the supply of current, however, could not be too carefully considered. When the final plans were worked out, provision was made to supply Marianna mine from three separate transmission lines. The main line comes from the substation at Washington, Pa., on the main trunk line between the Windsor and the Connellsville plants; another line comes from a substation situated between Washington and Connellsville, and a third comes from Monongahela City. When these are completed the power supply will not be totally cut off unless all three of the large West Penn generating stations are out of commission. The first line of the three will be used in ordinary operation, and the other two will



PLAN AND ELEVATION OF MINE FAN IN OPERATION

The dotted lines and dotted arrows show the position of the doors and the course of the air travel respectively when the fan is blowing air into the mine whereas the solid lines and solid arrows show the position of the doors and the course of the air when the fan is exhausting.

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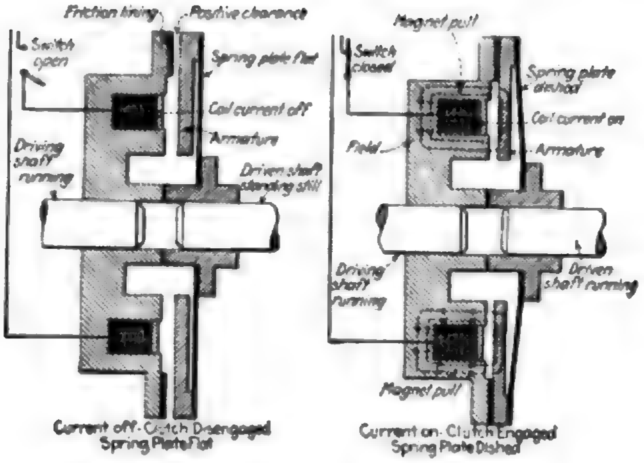
[*] Abstract of a paper entitled "Reducing Power Bills on Mine Fans with Synchronous Motors," presented before the Association of Iron and Steel Electrical Engineers, March 18, 1922, at Pittsburgh, Pa.

[†] Electrical Department, Cambria Steel Co., Johnstown, Pa.

[‡] Chief engineer, Union Coal & Coke Co., Bentleyville, Pa.



Current off-Clutch Disengaged Spring Plate Flat

Current on-Clutch Engaged Spring Plate Dished

CLUTCH WHICH ATTACHES FAN TO REVOLVING MOTOR

By passing a current through a field coil on the shaft of the motor it is magnetized and in consequence attracts and so engages by its magnetism a circular armature on the fan shaft. Thus the clutch can be put in operation while the motor is revolving at full speed. A dished spring plate holds the armature out of engagement when no magnetic attraction is provided.

serve during emergencies. Energy is transmitted at 25,000 volts and stepped down to 2,300 volts before being used. Under the arrangement described the power will be unusually reliable. It is realized that similar protection against failure of the supply is not always possible; at Acme and Hazel Kirk, a two-way service was deemed sufficient.

At the present time the electrification of Acme and Hazel Kirk is completed. The work at the latter mine entailed supplanting three engine-driven generators with motor-generator sets, driving two fans by motors and replacing the steam mine hoist with a modern electrically driven machine. The improvements at this mine cost about $45,000. The work was completed early in 1921, since which time the mine has not been operating. The saving effected during this idle period compared with other idle months when steam equipment was used, allowing for increase in labor costs, has been at the rate of $49,000 per year.

At Acme the engine of the steam-driven hoist has been replaced by a modern electric unit. The belted engine-driven generator has been supplanted by a 500-kw. motor-generator set and a 500-kw. rotary converter, and all the other steam equipment has been electrified. About the same rate of saving has been made here during the idle period as was effected at Hazel Kirk.

At Marianna the complete electrification plan included the building of a new and modern tipple. Sufficient work has been done to carry the mine electrically during the idle period. This included the installation of a 500-kw. motor-generator set, the replacing of steam-driven pumps by electrically driven machines and the placing of a motor drive on the fan.

The whole project has been highly successful and the past months of idleness have proved the estimated savings for an idle year to be correct, and although, as the mines have been shut down, no opportunity has been afforded to check the estimates under full load, assurance is felt, as the result of careful calculations, that the yearly full-load saving will be about $210,000. This represents a satisfactory return on an investment of approximately $400,000.

However, it is not the purpose here to dwell on the savings possible through the electrification of coal mines. The foregoing remarks are intended rather to suggest to those who are interested in steam-equipped plants that it might be wise to investigate thoroughly whether electrification would not be profitable.

In opening a new mine, the selection of a fan of the proper kind and capacity to render a lifetime of service is a somewhat hazardous undertaking, for many conditions must be assumed that in after years may no longer exist. Particularly did this uncertainty present itself fifteen or twenty years ago, when the characteristics of fans were not as well understood as they now are. Throughout the country many mine fans doubtless are operating that a careful investigation would prove fit subjects for interment in the scrap pile. At least this was the experience gained with the fans inherited at Marianna and at Acme mines.

At Marianna a patriarch of wonderful physical proportions was found. This fan was 35 ft. in diameter and 8 ft. wide, thus possessing a cubical capacity of about 7,880 cu.ft. It was directly connected on either side to a 26 x 48-in. engine of the Corliss-valve type and when operating at 60 r.p.m. produced 312,000 cu.ft. of air against a water gage of 3.03 in. and consumed while doing this quantity of work 550 i.h.p. Thus the efficiency was about 27 per cent. There were also appreciable radiation losses to be met, for the fan was located over 800 ft. from the boiler house.

As it was considered desirable to increase the quantity of air delivered to a minimum of 400,000 cu.ft. and to provide for an ultimate capacity of 500,000 cu.ft. it was readily agreed that an increase in relative efficiency of 30 or 40 per cent would provide a good return on quite a large investment. After a thorough investigation it was finally decided to purchase an 11 ft. 7 in. x 6 ft. 3 in. double-inlet Sirocco fan having a normal capacity of 500,000 cu.ft. per minute against 7.83 in. of water gage when operating at 220 r.p.m. This fan was supplied by the builders with a guarantee of 65-per cent over-all efficiency.

FAN WASTED SEVENTY PER CENT OF POWER

At Acme approximately similar conditions prevailed. An 18 x 6-ft. fan was driven by belt from a 300-hp. induction motor, producing 169,000 cu.ft. of air per minute against a water gage of 3 in., consuming meanwhile 255 hp., thus affording an efficiency of about 31.4 per cent. Here again the fan was too large for the work required. It can be proved both theoretically and by experiment that an otherwise well-designed fan, if either too large or too small for the work required, will have a low efficiency. For instance, the old Marianna fan when operating at 60 r.p.m. had a volumetric capacity of 472,800 cu.ft. and a peripheral velocity of 6,594 ft. per minute. As the quantity of air produced at this speed was but 312,000 cu.ft. per minute, the volumetric efficiency was only 66 per cent and the manometric efficiency about 55 per cent. In other words, a great mass was being revolved to do a small quantity of work. This was comparable to driving carpet tacks with a 20-lb. sledge hammer.

For Acme was purchased a 9 ft. 6 in. x 4 ft. 9 in. double-inlet Sirocco fan with a normal capacity of 300,000 cu.ft. of air against an 8-in. water gage. This had a guarantee of 76-per cent over-all efficiency. As the power required to operate these fans, even at the high efficiencies guaranteed, was appreciable, the type of drive to be used was carefully selected.

This paper is chiefly concerned with the type of drive finally chosen, namely, a direct-connected synchronous motor. It is believed that the drives installed on the Acme and Marianna fans are pioneers of their kind and mark a pronounced step forward in electrical installation.

At mines in the Johnstown district it is common practice to direct-connect induction motors to either end of the fan shaft by means of sliding couplings. The idea in using the two motors is that the one of less horsepower and slower speed can be used in case of emergency or to supply the mines on Sundays or idle days, when less air is needed. To obtain induction motors of the slow speeds necessary to suit the Johnstown plants is, of course, not a difficult problem, as the power supply is 25-cycle current and a standard induction motor can be provided.

DIRECT-CONNECTED INDUCTION MOTOR UNSUITABLE

With a 60-cycle supply a motor with a synchronous speed of 180 r.p.m. has forty poles and is an extremely expensive machine to build. In addition to this the power factor is low when compared with that of the higher-speed motors. For a 600-hp. 180-r.p.m. 2,200-volt 60-cycle induction motor the best power factor guarantee offered by the manufacturers was 77 per cent on full load and 71 per cent on three-quarter load. As the demand is figured by dividing the kilowatts consumed by the power factor and multiplying by the diversity factor, such a motor would be expensive to operate. The direct-connected induction motor, therefore, was rejected as being impossible.

The possibility of substituting belts and rope drives for gears in the reduction of motor speed was next investigated. The turbo-gear, which has a high efficiency and allows of alignment of the motor and fan shafts, was given first consideration. This device would permit of employing a high-speed induction motor possessing a good power factor. The fan manufacturers, however, asserted that this drive was too rigid and that the stresses imposed by it would soon ruin the fan.

SEALING INLET OF FAN LOWERS POWER NEED

These stresses are caused by variations in the air volume and pressure, which arise from changing conditions in the mine. This type of drive accordingly was abandoned, and the synchronous motor came under discussion. All manufacturers emphasize the low starting and pull-in torques of this type of machine and none was enthusiastic about the proposed application. As a result an investigation was started to find a way to reduce the pull-in torque required and several tests were made on existing drives.

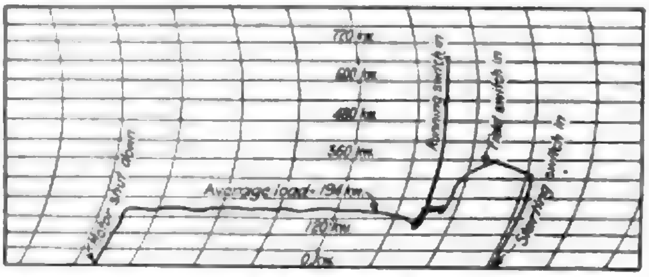
It is obvious that if no air is permitted to escape from or if air is prevented from entering the fan, there will be a reduction in the amount of work done and hence a decrease in the power required. In practice it is impossible to seal the inlet or the outlet in a field test, and for this reason the reduction in power will vary materially from that calculated or from that secured in laboratory tests.

In order to determine the reduction in power obtained by closing the stack a test was made on a 750-hp. 210-r.p.m. 2,200-volt 25-cycle direct-connected induction motor driving a 12-ft. double-inlet Sirocco fan. Under normal operating conditions the motor speed was 200 r.p.m. and the load 432 kw. With the stack closed and the air intake open, the motor speed increased to 208 r.p.m. and the motor load fell off to 268 kw. A comparison of these results shows that the load became $\frac{268}{432}$, or 62 per cent, of that existing under normal operating conditions.

This result was checked by making a test on the 300-hp. motor installed on the opposite end of the fan shaft. Under normal operating conditions this motor pulled 150 kw. at a fan speed of 143 r.p.m. With the stack closed the load was reduced to 96 kw. at 145 r.p.m. This test thus showed a reduction in power to 64 per cent of that consumed at normal load.

In the above results the speeds were not taken into consideration. If this is done it will be found that the loads will show somewhat greater reductions. Had these been synchronous motors, they would have attained full speed before the stack was opened and this speed would have remained constant.

A test was run on another fan to obtain the ratio of normal load to that imposed with the air intake closed. The air was shut off by boarding up the intake of the fan casing. The stopping employed consisted of two layers of 1-in. flooring reinforced by two 6 x 6-in. timbers. This bracing was calculated to withstand a pressure of 35 lb. per square foot. The motor driving this fan is rated at 750 hp. at 243 r.p.m. and 2,200 volts. By means of resistance in the rotor, the full load speed is reduced to 208 r.p.m. Under normal operating conditions this fan motor averaged 444 kw. at 206 r.p.m. against a 6-in. water gage.



KILOWATT CHART OF 600-HP. MARIANNA FAN MOTOR

The graph of power used follows the zero line till the point marked "Starting switch in" is reached. Then the motor starts, and the current demand increases suddenly to about 310 kw. and rises gradually to 360 kw., after which, with the closure of the field switch, it falls to about 190 kw. When the running switch is thrown in the power used rises momentarily to 660 kw. and drops with equal suddenness, running along steadily thereafter.

After the intake was boarded up the load decreased to 243 kw., but the vacuum built up within the fan casing was far in excess of calculations. The water gage used had an 11-in. scale. As the fan came up to speed, however, the gage rose rapidly until the water was all sucked out of it. The bracing began to groan and its motion somewhat resembled that of an accordion when in action, showing that a powerful suction had been developed. The load with the intake closed was 243 kw. at a speed of 230 r.p.m., or 54.7 per cent of the normal load.

With such a difference of speed on the two tests a direct comparison of loads is hardly fair. If we assume that a synchronous motor running at 250 r.p.m. was driving this fan and assume further that the load varied with the cube of the speed, the normal operating load would have been 770 kw. and that with the intake closed would have been 300 kw. Using these figures, the load would decrease to 39 per cent of that normally imposed. This figure has been checked on the synchronous motor-driven fan and found to be a close approximation. Owing to the vacuum developed by closing the air intake, it was decided that the safer plan would be to close the stack if a reduction in load for starting purposes was required.

Although it is possible to build synchronous motors with high pull-in torques, capable of starting fans and pulling into step if the load is 75 per cent or less of the full load rating on the motor, a better method would be to bring the motor up to speed without any load and then attach the fan. This can be done by means of a positive magnetic clutch. Like other types of clutches, this one is used for connecting and disconnecting machinery from its source of power. When the circuit through the electro-magnet is closed, the clutch is engaged; when it opens, the clutch is disengaged. One member of the clutch contains the magnet coil, which, when energized, pulls the other member into contact with it. The contact is made on a friction surface which is carried by a flange on the outside of the first member. As long as the electro-magnet is energized the two members rotate as a unit. When no current is flowing through the coil, these members stand apart, and a positive running clearance is provided. This clutch affords smooth acceleration, has no end thrust, is built for a fixed capacity, and is not affected by centrifugal force. Its reliability has long been established and hundreds of these clutches are in operation.

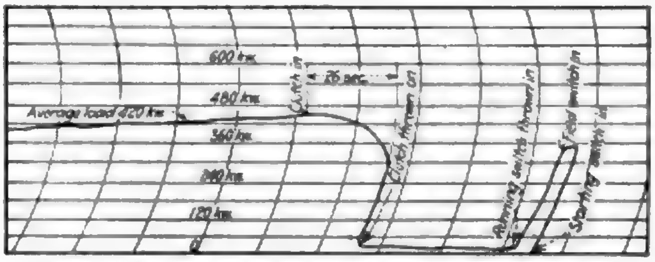


CHART OF SAME FAN WHEN CLUTCH WAS USED

This shows how effectually the clutch reduces the peak. With this arrangement the power used is never above 450 kw. and the average load 420 kw. What better provision could be made?

A 72-in. clutch of this kind installed on a 2,000-hp. motor in a wheel mill has been operated several hundred times each day without once failing. On a mine fan the clutch would have to function in starting only about once a week. By means of control resistance and relays, the operating time of these clutches can be varied over a wide period.

For the Marianna fan a 60-in. clutch was purchased complete with control equipment for a maximum operating time of 90 seconds. A 48-in. clutch with similar control was procured for the Acme fan.

As these installations were to be of a more or less experimental character synchronous motors with 35-per cent starting and 75-per cent pull-in torques were purchased. It would be possible to start and bring such machines up to speed with their respective fans attached. The motor at Marianna is rated at 600 hp., 180 r.p.m., 2,200 volts, with a power-factor correction of nine-tenths. The Acme fan motor is rated at 350 hp. at 210 r.p.m. and 2,200 volts.

Not only is the demand penalty resulting from the poor power factor of the induction motor saved by using these synchronous machines but they also earn an extra 5 per cent discount by giving line regulation when operating at the leading power factor. Both these machines drive their respective fans at the slower speed. The high-speed drive of the last-mentioned fan will be a 600-hp. 277-r.p.m. synchronous motor. That for Marianna will be a 900-hp. 220-r.p.m. synchronous motor. Both mines will have to be further developed before these larger motors will be needed, as the quantity of air furnished by the existing drives is sufficient to meet present requirements.

At Marianna the 600-hp. motor operating at 180 r.p.m. does not provide the speed for which the fan is designed and upon which the guarantee is based. A test, however, showed that even with this reduced speed the new installation developed 461,000 cu.ft. of air per minute against a water gage of 4.2 in. The motor in doing this work pulled 408 kw., or about 500 hp. With the stack closed, the motor pulled 194 kw., or 47.4 per cent of the normal load. During the tests this motor was started several times with the clutch energized and the fan attached, the stack being closed. No difficulty was experienced in getting the machine onto the line. By using 84-per cent line voltage as the starting potential the motor with the fan attached can be brought up to speed and thrown on the line with the stack open. This test proved that the high pull-in torque asked for was possessed by this machine.

Under actual operating conditions the motor will never be put on the line with the fan attached and the stack open. In an emergency it may be necessary to bolt the two halves of the clutch together; the stack then can be closed and the fan started as shown by the graphic chart.

At Acme the 350-hp. motor pulled 258 kw., or 345 hp., and produced 277,000 cu.ft. of air per minute against a water gage of 4.8 in., thus showing an over-all efficiency of fan and motor combined of 65.1 per cent. Allowing the motor its guaranteed efficiency of 92 per cent, this shows 70.8-per cent efficiency for the fan alone. On this fan no experiments were made with the stack closed, as the trials conducted at Marianna were considered sufficiently conclusive.

FAN GETS UP TO SPEED IN HALF MINUTE

The clutches provided for both of these installations have a time element of 90 seconds. Experiment has proved, however, that this period is not required to bring the fan up to speed, and the setting has been gradually reduced to between 25 and 30 seconds. The graphic chart taken with the Exterline meter shows a smooth curve, and no jerk on the fan is noticeable.

In conclusion it should be stated that both of these drives with their clutches have been operating for the past six months with no delays chargeable to electrical trouble. It seems reasonable to assume that this opens a large field for the synchronous motor. The clutches employed are as reliable—if not more so—as the motors themselves, and by their use special machines with high pull-in torques are rendered unnecessary.

An ordinary standard synchronous motor of the proper speed will readily fulfill all requirements, and though, as has been previously stated, closing the stacks and employing high pull-in torque motors affords a degree of safety should anything unexpected happen to the clutch, nevertheless under any condition of starting without the use of the clutch it will be found that the starting peak is considerably increased.

It is acknowledged that many mining men prefer variable-speed motors for driving mine fans inasmuch as the quantity of air desired varies. For this reason objections may be raised to using direct-connected synchronous machines. With induction motors the speed can be varied by inserting resistance in the secondary circuit. This reduces not only the speed but the power factor and the efficiency of the motor as well. With a direct-connected synchronous motor the same effect can be obtained by bulkheading or choking the fan drifts. Undoubtedly the efficiency of the unit will be somewhat reduced, but experience has shown that this loss is not as great as that incurred in getting a similar reduction in capacity by inserting resistance in the circuit of the induction motor.

Instead of using a synchronous motor with a magnetic clutch another scheme has been suggested that would virtually make the clutch a part of the motor. This could be done by so designing a motor that in starting the stator would revolve instead of the field. When this has been brought up to synchronous speed and the machine put on the line, a brake could be applied to the stator to reduce its speed gradually. As the machine would remain in step, the slowing down of the stator would cause the rotor with the fan attached to start spinning at a speed corresponding to the decrease in speed of the stator. The brake pressure would be applied gradually until the stator came to a standstill and was locked in place. The field and fan would then be rotating at synchronous speed. This scheme offers another field for development in the synchronous motor.

It was developed during the studies on blanking off the fan discharge that louvers could be so arranged on the fan stack as to permit of easy throttling of the fan load. These would possess the advantage of allowing one man to open and close the stack. A construction of this kind has since been installed by the American Blower Co., but it will be found that the starting peaks will be about the same as those obtained by the Marianna experiments conducted with the stack closed by means of cut-off doors.

It may be interesting to note that tne money expended on these two fan improvements is an excellent investment. For instance, the Marianna fan load of 461,000 cu.ft. against a water gage of 4.2 in. represents an expenditure in actual work done of about 305 hp. It can readily be seen that the saving of approximately 27 per cent on this amount of work actually performed is at the rate of about 60 kw. and this over a period of 720 hr. per month amounts to 43,100 kw.-hr. At 1.3c. per kilowatt-hour this represents a saving of about $575 per month in power alone.

A COMPREHENSIVE SERIES of tests on the dewatering of washed coal sludge with vacuum filters has been made at the central experiment station of the Bureau of Mines, at Urbana, Ill. These tests led to the conclusion that where the sludge is clean enough to be of fuel value and the water supply is such that reclamation of the water is important, the use of filters is practicable. During a partial survey of coal washing practice in the Birmingham district of Alabama, especial attention was given by the bureau to methods of drying in use. Data on the operation of centrifugal driers and on gravity drainage at one plant show the same resulting moisture reduction by centrifugal drying and by natural drainage in railroad cars for 24 hours.

IN UTAH AND SOUTHERN WYOMING a number of mines are operating on coal seams ranging from 14 to 60 ft. in thickness. Included in these mines are five that are heavy producers and in which the seams average approximately 26 ft. thick. Data on the methods employed in these high seams, particularly with regard to the extraction of pillars, is being gathered by the U. S. Bureau of Mines and studies are being made of the efficiency of the different systems. When the investigation is completed the material will be prepared for publication.

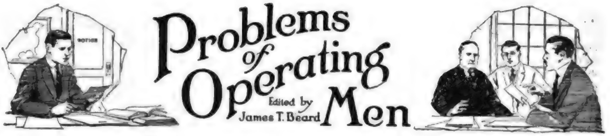
Inspectors Condemn Loading of More Than One Shothole at a Time

AFTER a careful inquiry into the causes of the explosion at the Gates Mine of the H. C. Frick Coke Co. the inspectors in their report declared that "they were not in sympathy with the manner in which blasting operations have been conducted in that mine and are decidedly of the opinion that the rules for blasting should be revised." This decision follows the declaration that "a well-established rule of the H. C. Frick Coke Co., looking to the prevention of the firing of shots in rapid succession, forbids the firing of more than one shot at a time, but the permission to load a number of shotholes in a working place at one time invited the very practice that the rule attempted to prevent, namely, the rapid firing of shots, and the evidence, although possibly not conclusive, as to initial point of the explosion indicates that both the company's rules regulating blasting and the law were disregarded."

GATES MINE OF H. C. FRICK COKE CO.

Twenty-five men, comprising the night force of mine workers at this mine, were killed as the result of an explosion at 1:30 a.m., Feb. 2. Most of the men were asphyxiated by the fumes and gases which the explosion developed. The explosion took place a long way from the shaft bottom.

The inspectors were of the opinion that the initial point of the explosion was at the face of No. 4 flat at No. 21 butt. "The ignition at this point was brought about in all probability by flame from an overcharged shot or shots projected into an atmosphere laden to some extent with coal dust and various combustible gases incident to a blast or blasts fired immediately preceding" and aided probably to a slight extent by gases produced by natural agencies. "The explosion thus initiated was propagated and extended by the dryness of the workings" in the neighborhood of the initial blast "and was arrested only by the dampness and cleanliness of the workings and by their expanding form in the south portion of the enclosed area." The inspectors, however, say that there is a possibility that this explosion started at some other point than that at which they have placed the origin of the explosion, but declare that the violence at the point indicated and the general trend of the forces exhibited seem to justify their conclusion that the explosion originated at the point they have indicated. In any case the firing of shots in quick succession should be avoided.



Problems of Operating Men

Edited by James T. Beard

Anthracite vs. Bituminous Stripping Operations

Steep Inclination of Anthracite Seams Not Favorable to Stripping — Old Workings Underlying Upper Seams Endanger Heavy Machines Employed—Cost of Equipment Must Be Considered

REFERRING to R. Dawson Hall's comparison of anthracite and bituminous stripping operations, contained in *Coal Age*, Jan. 19, p. 95, allow me to state that there are many reasons not mentioned by Mr. Hall that explain why the anthracite field has not resorted more generally to stripping operations.

Without going into detail, I wish to enumerate some of the more important hindrances to the general adoption of this method of working the overlying seams of coal in the anthracite region. The importance of these reasons will be fully appreciated by those familiar with practical mining in the anthracite field of Pennsylvania.

SEAMS STEEPLY INCLINED

As is well known, practically all of the anthracite seams are steeply inclined. The thicker underlying seams have been very largely worked out, while the thinner seams above were left for later extraction. The removal of the overburden, in conducting stripping operations under these conditions, would involve transporting the coal and refuse material over heavy grades or planes.

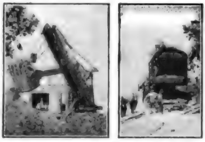
Obviously, this would be accompanied with a greatly increased expense, as compared with similar operations in the bituminous field, where the coal seams have generally little or no inclination. While there are some notable exceptions, such as Lattimer and Locust Mountain, the fact remains that there are very few virgin seams of anthracite being stripped at the present time, because of the difficulties.

OLD WORKINGS ENDANGER THE HEAVY EXCAVATING MACHINES

Conducting strippings over old workings always involves extra hazards, and endangers the heavy expensive equipment employed, by reason of the open gangways and breasts, which are liable to cave and prevent the further prosecution of the work above.

The accompanying photo will afford some idea of the style and weight of the kind of equipment required in successful stripping operations. On the right of the figure is shown a 100-ton Bucyrus, 78-C, excavator being taken up a 15 per cent grade for use in the Bast stripping of the P. & P. Coal & Iron Co., near Ashland, Penn. On the left of the figure is shown the same machine in full operation, in the act of transporting a three-yard dipper full of excavated material to the waste dump.

Finally, the amount of overburden to be removed must always be considered in relation to the cost of the equipment involved. There are many profitable anthracite strippings that are not of sufficient size to pay the carrying charges of these 100-ton shovels and standard gage cars and locomotives, even though it were practicable to use them on the heavy pitches and over the old workings so common in the anthracite field.


BUCYRUS 78-C, TRAVELING AND AT WORK

As regards the contractor, the coal companies recognize that this is a special line of work and, as such, is more efficiently handled by specialists.

J. ROBERT BAZLEY,
Contracting Mechanical Engineer.
Pottsville, Pa.

Alabama Law re Gassy Mines

Criticism of law well founded in some respects — No time specified for the fireboss' work to begin—Mark to be placed at least twenty-five feet back from the face where gas is found—This requirement in line with other state mining laws.

READING the letter of R. W. Lightburn, *Coal Age*, Feb. 2, p. 210, which I consider a just criticism of the weak points in our Alabama mining law relating to gaseous mines, afforded me no surprise. One of these points at least, has been the subject of controversy, at different times, by mining men in the state.

Attention now being drawn to the matter, in *Coal Age*, may help to bring about the needed remedy and cause the law to be amended. The chief point is the omission of any specified time for the fireboss to commence his work. While Mr. Lightburn has very properly taken strong objection to this omission in the Alabama law, I feel that he has placed undue emphasis on another point to which he refers.

MARKING A PLACE CONTAINING GAS

This second point relates to the marking of a place by a fireboss when he has found gas in dangerous quantity. The law requires (Sec. 32) that the fireboss shall leave a conspicuous sign or mark to indicate the presence of gas in the place. The mark must be placed in the entrance or neck of a room, or "at a point at least 25 ft. distant from the face" of a heading containing gas.

This reference, in the Alabama law, seems to be quite in line with similar references in the mining laws of Pennsylvania, Illinois, Colorado, Tennessee and other states. In each instance, the fireboss is required to place a danger mark or signal at a safe distance from the place where gas is found.

In this connection, it should be stated that the Alabama law makes 25 ft. the minimum distance that the mark is to be placed from the face of a heading. The reference made to this point, in *Coal Age*, Nov. 10, p. 769, omitted the words "at least," in naming this distance.

SPECIAL RULES AT EACH MINE

Reference is made, by Mr. Lightburn, to the fact that the Alabama law makes no mention of the mark that the fireboss should leave at the face of every place examined, as evidence of his presence in the place that morning. This omission seems to have been partially corrected, in the law, by requiring (Sec. 37) that special rules be adopted at each mine, covering all classes of work; such rules to be printed and posted in a conspicuous place at the mine.

It only remains for me to state, in closing, that the Alabama law (Sec. 32) requires the fireboss to inform every man as to the condition of his working place, in respect to dangerous quantities of gas, before the man enters the mine. The same section makes it a misdemeanor for any person to enter or approach any place in the mine, after he has been informed that danger exists therein.

My purpose in writing is not to bolster up the weak points of the Alabama law; but merely to show that the mine worker, here, has more protection under the law, than is indicated in the letter to which I have referred, although this protection is far from being satisfactory.

John Walls, Sr.

Bayview, Ala.

Misconstruing the Mining Law

Three references in the bituminous mine law relating to distances apart of cut-throughs, cause some difference of opinion as to their right meaning — Care needed in reading the law.

ATTENTION has been drawn at different times, in *Coal Age*, to the careless wording of certain paragraphs of the mining law, which have led to confusion in the minds of men whose duty it is to interpret the law. But let me refer, here, to an instance where the law explains clearly, but has been misconstrued more than once through careless reading.

Only recently I have listened to the arguments of several persons who have formed a wrong idea of the meaning of the Bituminous Mine Law of Pennsylvania, in respect to the distance apart of breakthroughs in rooms and entries. I have known miners and even men holding official positions about the mines who have, through their careless reading of this law, formed the same wrong opinion.

These men all claim that the law permits the driving of butt entries, a distance of 200 ft. beyond the last breakthrough. In one or two instances, assistant foremen and firebosses have claimed that this was no violation of the law.

In vain I have tried to reason with some of these men, telling them that they had better read the law more carefully, and they will find that the maximum distance a butt heading can be driven beyond the last cut-through is 105 ft.

Law Clearly Specifies

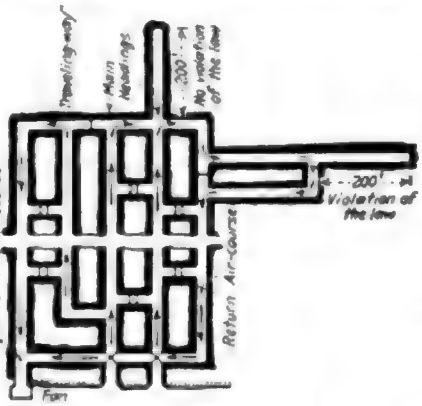
As I read the law (Art. 9, Sec. 3) it specifies plainly that cut-throughs shall be made, in all room pillars, at such distances apart as may be required by the mine inspector, "not more than 35 nor less than 16 yd. each, for the purpose of ventilaiton."

Again, (Art. 4, Sec. 2) the law makes it the duty of the mine foreman to "see that proper cut-throughs are made in the pillars of all rooms and of all entries, in accordance with Section 3 of Article 9 of this act, and that they are closed when necessary, so that the ventilating current can be conducted in sufficient quantity through the last cut-through to the face of each room and entry by means of check doors."

To my mind, these two sections of the law clearly limit the distance apart of cut-throughs in all room and entry pillars. The law makes one exception to this rule, which relates to main entries only, when these entries are driven for the purpose of exploring the strata ahead.

In referring to main entries, the law reads (Art. 6, Sec. 4), "Said entries shall be separated by pillars of coal of sufficient strength, and shall not be driven more than 200 ft. beyond the last cut-through, except for exploratory purposes."

The same section requires a new gaseous mine, in which locked safety lamps are used exclusively, to be opened by driving the main entries five abreast, if these entries are to be driven 5,000 ft. or more in length. Two of the entries must lead to the main opening and two to the second opening, while the fifth is to be used exclusively as a travelingway. I have prepared a sketch to illustrate what I believe is the meaning of the law in this regard.



DIAGRAMMATIC PLAN OF MINE

Joseph Northover,

Bruceton, Pa. Assistant Foreman.

Experienced Men Perform More Dangerous Work

Failure of men to obey orders blamed to foremen — Men who disobey orders should be punished—It is always the experienced men who are called to do dangerous work.

IN discussing what constitutes a practical miner, reference has been made, incidentally, to the experienced miner being the man who is more often injured or killed. It has been assumed that years of experience make the average miner careless and disregardful of danger.

One writer has stated that, in general, miners who have had several years' experience will not listen to instructions or obey the orders given them by their foremen, while the new miner, the so called "greenhorn" seldom fails to listen to instructions given him and, for that reason, makes the safer worker and a more efficient miner.

While it is true that some miners who have worked long in the mines are apt to think that they are capable of taking care of themselves and need no instructions from the foremen, in regard to making themselves safe, I want to say that it is a mine foreman's fault if his orders are not obeyed, regardless of whether the man is an experienced miner or a greenhorn.

If a foreman finds that his orders are not obeyed he should provide a suitable penalty, or there will soon be no discipline in the mine. My judgment is that it is up to every mine foreman to see that his orders are promptly obeyed, regardless of whether or not the man is an experienced miner.

Allowing it to be true that experienced men are injured or killed more frequently than those of less experience, there is yet a reason for this. We all know that when there is dangerous work to be performed experienced men are selected for the job.

What class of men are chosen for pillar work, drawing timbers in waste places, timbering high falls or taking down a bad rock, fighting mine fires and doing other hazardous work? Would any foreman send a greenhorn to do such work?

My firm belief is that technical knowledge and training must go along with a miner's experience to make it of real value, either to himself or to his employers. Without this technical knowledge and training experience in mining or any industry is of limited value. The miner who has both will make a safer and more efficient workman.

In closing, let me repeat that it is the duty of every mine foreman to teach and train his men, disciplining the man who fails to follow his instructions. My claim is that the foreman is the responsible head of the mines.

James Thompson.

Mayport, Pa.

Dangers to Which Mine Examiners Are Daily Exposed

Examiner must be qualified — Conditions he must meet numerous and varied — His work often underestimated by higher officials — Territory too large to examine properly in limited time.

BEING a certified mine examiner (fireboss) and mine manager (foreman), at mines in Oklahoma and Illinois where I am at present located, the discussion of the certification and qualification of these officials, appearing in *Coal Age*, has interested me deeply and I want to express a few thoughts bearing on the work of the examiner.

In the first place, the mine examiner must be qualified for his work and to do this he must study to gain a knowledge of gases, their nature, properties and behavior, that will enable him to intelligently perform his work. He must realize that the lives of many men are daily in his hands, as well as his own life and safety.

When the examiner goes down into a mine, he little knows what he will encounter before he returns to the surface. Many changes may have taken place since he last left the mine, and he must be prepared to detect these changes and judge of their effect in creating new dangers to the workmen whose lives are in his charge.

Few who have not filled the position of examiner in mines can realize what the work means to the man who undertakes to perform its duties conscientiously and intelligently. Alone, he enters the mine, in the early hours of the morning. It may happen that shots fired the night before, by the miners, have discharged timbers, leaving the roof ready to fall at any moment, in places he must examine.

Or, a fire may have been started by the ignition of a gas feeder, or by reason of slack or fine coal left in the gob. If not this, it may chance that a squeeze is in progress caused by miners robbing their pillars too closely, making heavy roof falls imminent and dangerous.

These and other numerous conditions and dangers the mine examiner braves as he proceeds from place to place in the examination of his section. The time is short and he must hasten in order to complete his work and report, at the shaft bottom, by the time appointed for the men to enter the mine.

Suddenly, a new danger confronts him. At the face of some dip workings, a considerable distance from the main airway, the man loses his light. For some time he has noticed that the air was bad, the ventilation slack and, now, every attempt to relight his lamp fails. He stumbles about in the dark, in a vain attempt to reach better air.

I have been there, perhaps you have. With no track to guide him out, we do not wonder that the man's hair stands up, if he has any, and his scalp seems tightly drawn above his head, while cold chills run down his back as he gropes his way back. His chances we who know, can imagine.

Truly, the training of the mine examiner fits him for assuming the higher duties of the manager. No experience could better fit a man to judge correctly the conditions and dangers to which miners and daymen are exposed; or better equip him with the knowledge of how to protect these men while at their work. All that is needed, in addition, is the ability to handle men in a way to secure the best results.

Strange as it may seem, the work of a mine examiner is too often underestimated by the higher mine officials. In many cases, his employment is only considered necessary, by them, in order to comply with the law. As a general thing, they are given too large a territory to examine properly in the appointed time.

The examiner who must run, in making his rounds, cannot be expected to discover every danger of roof and coal, make the needed tests for gas and leave his mark in each place to show that it is safe for work.

A miner coming into his place, in the morning, and finding the examiner's mark on the rib, glances hastily over the roof and seeing no cross-marks to indicate bad top, takes it for granted that everything is all right and goes to work. It may be that within a short time thereafter, the same man is caught by a fall of rock that should have been marked by the examiner had more time been given him to examine the place.

I have known examiners to go into the mine, at 3 o'clock in the morning, so as to make their rounds thoroughly and get out in time to report before the men enter for work. If more attention was given to these things, by the higher officers at our mines, I am satisfied coal companies would save money.

Edwardsville, Ill. DAVID A. YOUNG.

Inquiries Of General Interest

Mining Thin Seam With a Coal Puncher

Pick Machines or Coal Punchers Particularly Adapted to Mining Irregular Deposits on Little or No Inclination—Advantage Where Coal Contains Sulphur Balls That Forbid Machine Mining

KINDLY advise me through the columns of *Coal Age*, whether it is possible or advantageous to mine a 28-in. coal seam, using a coal puncher or pick machine. The coal is clean and contains no sulphur. The roof overlying the coal is good. Please explain the particular advantages to be obtained in the use of the pick machine.

Darlington, Pa. CARL CRAFT.

This is a fairly thin seam of apparently good coal overlaid with a good roof. The inclination of the seam is not given, but judging from the information at hand and assuming that the inclination, if any, is not sufficient to bar the use of machines, it can be stated that the conditions are ideal for machine mining, using a chain coal cutter for that purpose.

Owing to the fact that the thinness of the seam affords but limited headroom, we cannot recommend the use of a coal puncher in this case. As is well known, the puncher or pick machine is mounted on two low wheels when used for undercutting the coal.

The operator sits on a board one end of which is raised 12 or 14 in. above the floor. The inclination of the board has the effect of keeping the machine up to its work, as each blow is struck in the coal. Sitting on the board, the operator would not have sufficient headroom to work the machine, in this thin seam.

Again, the mining will have to be done in the coal, provided there is no underclay or other suitable material that can be mined with a pick. In that case, the use of a pick machine would mean the loss of too large a proportion of the coal in such a thin seam. These are two reasons why it would not be advisable to use a coal puncher in mining this coal.

The pick machine is particularly advantageous in the mining of seams of moderate thickness underlaid with a bed of fireclay in which the mining can be done without the loss of coal. The pick machine has the advantage over a chain machine whenever the bottom is irregular, or the coal or mining dirt contains sulphur balls, or where there are boulders that must be mined around, in the extraction of the coal.

This type of machine permits the cutting tool to be driven in any direction when cutting around an obstruction, or where there are faults or rolls that would bar the use of either a chain cutter or a shortwall machine.

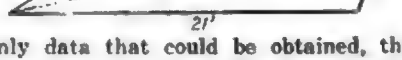
Again, the pick machine can be mounted on a post, which enables the mining to be made in a parting in the seam, at a distance above the floor. Mounting the machine on a post also makes it possible to shear the coal with the pick, which is a particular advantage in the use of this machine.

Finally, when mounted on a post set firmly between the roof and floor of the seam, it is possible to use the pick machine on inclinations where a chain machine could not be employed. These are the principal advantages of the pick machine.

Measuring the Area of a Roll in a Mine

Computing the area of a roll crossing a room—In shape, a quadrilateral—Length of each side carefully measured.

IT was necessary, recently, to measure the area of a roll that crossed one of the rooms, in our mine. The roll was in the shape of a quadrilateral, but none of its four sides were parallel. The length of each side was carefully measured, also, the length of a diagonal line, from corner to corner. As this was the only data that could be obtained, the area bounded by these four lines had to be computed without knowing the angles formed by the figure. The lengths of the four sides were 5, 9, 15, and 21 ft.; and the length of the diagonal 23 ft., as shown in the accompanying figure.



Believing this is a problem that will interest other readers, I would like to see its solution given in *Coal Age*.

Linton, Ind. MINER.

The diagonal of a quadrilateral divides it into two triangles, the area of which must be calculated separately and their sum will then equal the area of the quadrilateral.

To find the area of a triangle whose three sides are given the rule is: From the half-sum of the three sides, subtract each side separately. Then, find the continued product of the half-sum and the three remainders thus obtained and extract the square root of the product.

In this case, the half-sum of the three sides of one of the triangles is: $\frac{1}{2}(9 + 15 + 23) = 23.5$ ft. Then, subtracting each side, separately, from this half-sum gives the three remainders 14.5, 8.5 and 0.5. Therefore, for the area of the first triangle, we have

$$\text{Area} = \sqrt{23.5 \times 14.5 \times 8.5 \times 0.5} = 38.05 \text{ sq.ft.}$$

In like manner, the half-sum of the three sides of the other triangle is: $\frac{1}{2}(5 + 21 + 23) = 24.5$ ft. and the area of that triangle is

$$\text{Area} = \sqrt{24.5 \times 19.5 \times 3.5 \times 1.5} = 50.08 \text{ sq.ft.}$$

Finally, the sum of these two areas gives, for the area of the quadrilateral, 88.13 sq. ft.

Examination Questions Answered

Alabama Firebosses' Examination, Birmingham, Jan. 25-28, 1922

(Selected Questions)

QUESTION—*On your examination of a mine generating explosive gases you find the ventilation in good condition and no place containing any accumulation of gas; but, as you are about to admit the workmen, you discover the ventilation has been interrupted by stopping the fan or by other causes; what would be your method of procedure?*

ANSWER—The men should be notified promptly that they cannot enter the mine, until another examination has been made and the working places reported safe for work. Any interruption of the circulation, by the temporary stopping of the fan, may create a dangerous condition in one or more of the working places if the mine is generating much gas. The fireboss can take no chances, by allowing the men to enter the mine after such a temporary interruption of the circulation, but must assure himself that there is no danger.

QUESTION—*If you were acting as fireboss and had an entry driven 200 ft. ahead of the last crosscut and found during your examination that the entry contained explosive gas back 100 ft. from the face, how would you proceed?*

ANSWER—The Alabama Mining Law requires breakthroughs to be made in all room pillars at such distances apart as the mine inspector may require, not to exceed 70 ft. The law says nothing about the distance apart of crosscuts in entry pillars. In the case here mentioned, the fireboss should at once bar the entrance to the headings by a proper danger board. All the men should be withdrawn from that section of the mine before any attempt is made to remove the gas.

QUESTION—*After your examination of a mine, what evidences would there be to show that you had examined all the working places therein?*

ANSWER—The fireboss is required by law to mark the date of examination, at least 25 ft. distant from the face of each place examined, as evidence that he has examined the place and found it to be safe for work. On completing his examination of all the working places in his section of the mine, the fireboss is required to enter a full report in a book kept for that purpose at the shaft or slope bottom or the entrance to the mine. This report must state fully where any dangers have been found, give their nature and be signed by the fireboss making the examination.

QUESTION—*How often is it necessary to examine the worked-out rooms on a working entry in a very gaseous mine?*

ANSWER—The mining law makes no mention of the frequency of such examinations. All such worked-out rooms on live entries should be examined each day, if ventilated and left unsealed.

QUESTION—*What should be the first thing for you to observe, as fireboss, on entering a mine for duty?*

ANSWER—The fireboss on first entering a mine must observe that the usual quantity of air is passing in the main intake entry leading into the mine. Before going into the mine, he should have examined the fan to ascertain that it is working properly and running at its customary speed. He must also have prepared his lamp properly by examining each part thoroughly to see that it is in good condition and safe.

QUESTION—*If certain working places generated gas freely and other working places gave off little gas which would you examine first, in making your rounds in the morning, and for what reason?*

ANSWER—Assuming that the places were all in the same section of the mine and ventilated by a single current of air, the examination should start at the intake end and follow the air throughout the section, examining each place in regular order.

Again, if the places generating gas freely are in a separate section of the mine, or ventilated by another current of air from what is circulating in the places generating little gas it would be well, provided this can be done conveniently and without loss of time, to examine the places generating less gas first, leaving the examination of the section or split where more gas is generated until the last. The reason for this is that there will then less time elapse between making the examination of the gassy places and the entering of the men for work. There will then be less risk of a dangerous condition occurring from any cause, before the men reach their places.

QUESTION—*Name two different gases met with in mines, giving composition and chemical symbols of each and state where these gases are to be looked for and how detected?*

ANSWER—The two gases most commonly found in mines are methane, or marsh gas, CH_4 and carbon dioxide CO_2. Methane is composed of one atom of carbon united with four atoms of hydrogen. Its presence should be sought at the workingfaces where fresh coal is being mined and at the face of steep pitches, or in rise workings and cavities in the roof above the falls. It is detected by observing the flame of a safety lamp, to detect the first appearanec of a cap on the reduced flame of the lamp.

Carbon dioxide is composed of one atom of carbon united with two atoms of oxygen. This gas must be sought in dip workings and in the gob and other waste and void places in the mine. The gas is heavier than air and tends to accumulate at the face of dips and other low places. It is detected by the dim burning of the lamps and final extinction; also, by the headache and nausea caused by breathing air containing this gas.

QUESTION—*Are there any conditions under which it would not be safe to use a safety lamp? If so, name them.*

ANSWER—It is not safe to enter a place that has been abandoned some time and may contain dangerous quantities of carbon monoxide, alone and depending on the safety lamp to give warning of danger. When entering such a place, a person should never proceed alone, and should carry with him caged birds or mice, which become more quickly prostrated than a person. It is also possible to detect the presence of carbon monoxide by means of a special device designed for that purpose, by making frequent tests as one proceeds. It is never safe to use a safety lamp if improperly assembled, improperly handled or when containing any defect that would make possible the ignition of the gas-charged air surrounding the lamp.

Byproduct Coke Output in 1921 Declined 35 Per Cent; Beehive, 73 Per Cent

THAT byproduct coking of bituminous coal is continuing to supersede beehive coking was shown conclusively in 1921, according to the U. S. Geological Survey. This change in practice has been in progress for some years, but the first convincing demonstration that the byproduct branch of the coking industry could maintain itself in a period of industrial depression more strongly than the beehive branch was made last year.

In 1921 the output of byproduct coke was almost 20 000,000 tons and that of beehive coke was about 5,500,000 tons, figures that show a striking contrast to those for 1920. when the output of byproduct coke was more than 30,000,000 tons and that of beehive coke was more than 20,000,000 tons. The output of beehive coke in 1921 was less than that in any other year since 1885. One month of the year showed an output of only one-ninth the average monthly output in 1920. The monthly average for 1921 was only about 27 per cent of that for 1920.

The output of byproduct coke in 1921 also showed a marked decline from that of 1920, though the output in the minimum month was more than half of that in the average month of the preceding year, and the output for the entire year was practically two-thirds that in 1920. This comparison of 1921 with 1920 becomes still more striking if we remember that 1920 was easily the "banner" year in the production of byproduct coke in the United States. In other words, despite the extraordinary slump in business, which greatly lowered the output of byproduct coke, it was greater in 1921 than in any preceding year except 1917, 1918, 1919 and 1920.

The continuance of the activity in byproduct coking during a period when business was subnormal may have been due in part to the economic superiority of the byproduct ovens over the beehive ovens but it is in part due to the fact that many byproduct coke-oven plants require elaborate organization and represent large investments and must therefore be kept active in order to preserve the working force intact and prevent the undue deterioration of the plants. The loss due to the operation of such plants at less than a normal profit is smaller than that which would be incurred if they were allowed to remain idle and thus to make immense investments wholly unproductive. Furthermore, the gas produced at many byproduct coke-oven plants is sold under contract to public-utility companies that supply gas to near-by communities, so that the discontinuance of the operation of the byproduct plant would constitute a violation of its contract with the public-utility company. In view of these facts the greater production reported by the byproduct coke industry in 1921 cannot be considered a measure of the relative cost of production in beehive and byproduct ovens.

Production, by months, of each type of coke, and the output of pig iron are shown in Table I. The fluctuations in the output of coke evidently followed closely the fluctuations in the output of pig iron.

TABLE I. ESTIMATED MONTHLY PRODUCTION OF BEEHIVE AND BYPRODUCT COKE AND OF PIG IRON IN THE UNITED STATES IN 1921

Month	Beehive Coke (Net Tons)	Byproduct Coke (Net Tons)	Pig Iron (Gross Tons)(a)
Monthly average, 1920	1,708,000	2,569,000	3,077,000
January, 1921	1,137,000	2,278,000	2,416,000
February	865,000	1,888,000	1,937,000
March	575,000	1,772,000	1,596,000
April	328,000	1,519,000	1,193,000
May	300,000	1,590,000	1,221,000
June	232,000	1,408,000	1,065,000
July	180,000	1,297,000	865,000
August	248,000	1,383,000	954,000
September	289,000	1,423,000	986,000
October	416,000	1,734,000	1,247,000
November	477,000	1,766,000	1,415,000
December	514,000	1,860,000	1,642,000
Totals, 1921	5,561,000	19,918,000	16,544,000

(a) Figures for 1920 from American Iron and Steel Institute; those for 1921 from *The Iron Age*.

Table I shows that the lowest monthly output was made in July, when only 11 per cent as much beehive coke was produced as the average monthly output in 1920. The output of byproduct coke in July was 52 per cent of the average monthly output in 1920, and the output of pig iron in that month was 30 per cent of the average in the preceding year. Thus it is evident that the decrease in the metallurgical demand for coke had the effect of greatly reducing the operation of beehive ovens but that it caused only a relatively small decrease in the production of byproduct coke.

Production of beehive and of byproduct coke in 1920 and 1921, by states or groups of states, is summarized in Tables II and III. These summaries show clearly that the decrease in production in 1921 was very generally distributed over the country, as there was an increase in the output of coke in only one state, New Jersey, where large plants that make byproduct coke produce gas for municipal supply and cannot therefore be operated only for the production and sale of metallurgical coke. The increase in that state, however, is not sufficient to be really significant.

TABLE II. PRODUCTION OF BEEHIVE COKE, BY GROUPS OF STATES IN 1920 AND 1921
(In Net Tons)

	1920 (a)	1921 (b)	Decrease Tons	Decrease Per Cent
Pennsylvania and Ohio	15,996,000	4,283,000	11,713,000	73
West Virginia	1,381,000	271,000	1,110,000	80
Alabama, Tennessee and Georgia	1,069,000	354,000	715,000	67
Virginia and Kentucky	1,300,000	374,000	926,000	71
Colorado and New Mexico	512,000	119,000	393,000	77
Washington and Utah	253,000	160,000	93,000	37
United States	20,511,000	5,561,000	14,950,000	73

(a) Final figures. (b) Estimate.

TABLE III. BYPRODUCT COKE PRODUCED IN 1920 AND 1921, BY STATES, WITH INCREASE OR DECREASE IN 1921.
(In Net Tons)

State	1920 Ovens	1920 Output (Tons)	1921 Ovens	1921 Output (Tons)	Increase (+) or Decrease (−) Tons	Increase (+) or Decrease (−) Per Cent
Alabama	1,081	3,123,890	1,101	2,406,000	—718,000	—23
Colorado	120	(a)	120	(a)	(a)	(a)
Illinois	794	2,136,793	894	1,326,000	—811,000	—38
Indiana	1,216	4,553,697	1,216	3,030,000	—1,524,000	—34
Kentucky	108	466,985	108	186,000	—281,000	—60
Maryland	300	682,132	360	293,000	—389,000	—57
Massachusetts	400	488,089	400	318,000	—170,000	—[illegible]
Michigan	389	1,393,445	389	778,000	—616,000	—44
Minnesota	220	674,801	220	431,000	—244,000	—36
Missouri	56	(a)	64	(a)	(a)	(a)
New Jersey	315	725,571	252	745,000	+19,000	+3
New York	732	1,040,192	732	815,000	—225,000	—22
Ohio	1,558	5,614,877	1,558	2,964,000	—2,651,000	—47
Pennsylvania	3,006	7,730,256	3,154	5,439,000	—2,291,000	—30
Rhode Island	40	(a)	40	(a)	(a)	(a)
Tennessee	24	139,121	24	58,000	—81,000	—58
Washington	20	26,284	20	21,000	—5,000	—19
West Virginia	274	447,392	274	184,000	—263,000	—59
Wisconsin	228	(a)	238	(a)	(a)	(a)
Combined states		1,590,426	....	924,000	—666,000	—42
Totals	10,881	30,833,951	11,164	19,918,000	—10,916,000	−35

(a) Included in "combined states."

Two new byproduct ovens were completed and put in operation during 1921: The Chicago Byproduct Coke Co., Chicago, Ill., with 100 Koppers ovens, and the St. Louis Coke & Chemical Co., Granite City, Ill., with 80 Roberts ovens. The following companies made additions to existing plants during the past year: Woodward Iron Co., Woodward, Ala., 20 Koppers ovens; Bethlehem Steel Co., Sparrows Point, Md., 60 Koppers ovens; Laclede Gas Light Co., St. Louis, Mo., 8 Piette ovens; Camden Coke Co., Camden, N. J., 37 Koppers ovens; Cambria Steel Co., Johnstown, Pa., 88 Semet-Solvay and 60 Cambria ovens; Milwaukee Coke & Gas Co., Milwaukee, Wis., 50 Koppers ovens, making a total of 503 ovens added to existing plants in 1921.

The annual production of byproduct ovens in operation on Jan. 1, 1922, would be 44,275,000 net tons of coke if the ovens continued in operation without interruption 365 days in the year. As the average yield of coke for the industry amounts to 69.9 per cent of the coal used, this output represents a coal-carbonizing capacity of 63,340,000 net tons a year. Operation at full capacity is impossible, however, even in periods of good demand for coke, and the figures for operation at 85 or 90 per cent of full capacity really represent a normal maximum for any considerable period. In other words, the byproduct coke ovens operable Jan. 1, 1922, can treat only about 55,000 000 net tons of coal a year, yielding about 38,000,000 tons of coke.

Bids Opened for Coal for Ten Municipal Departments of New York City

TENDERS were received by the Board of Purchase of the City of New York on March 16 for furnishing and delivering to ten city departments between April 1 and June 30, 76,364 net tons of anthracite and bituminous coal and 10,784 net tons of mixed coal.

Among the bids received, just made public, were the following:

Bellevue and Allied Hospitals, barge deliveries, 4,200 net tons Buckwheat No. 2—Penn Fuel Co., $5.70; W. J. Shea, $5.29; Cullen Fuel Co., $6.19; Intercity Fuel Co., $5.45; V. H. Youngman & Co., $5.92.

Harlem Hospital, 1,100 tons No. 2 Buckwheat—Penn Fuel Co., $6.70; W. J. Shea, $6.39; Stephens Fuel Co., $6.60; Intercity Fuel Co., $6.89, and Youngman & Co., $6.95.

Fordham Hospital, 825 tons, No. 2 Buckwheat—W. J. Shea, $6.64; Stephens Fuel Co., $6.60; Intercity Fuel Co., $7.19, and Youngman & Co., $6.95.

Reformatory Prison, Hart's Island, barge delivery:

	No. 3 Buck. 381 tons	Semi-Bitu. 560 tons
Penn Fuel Co.	$5 95	$5 95
W. J. Shea	5 77	5 97
Cullen Fuel Co.	4 34	5 98
Intercity Fuel Co.	4 83	5 98
Youngman & Co.	5 20	5 92
Tuttle-Burger Corp.		6 [illegible]
Whitney & Kemmerer		5 58

W. J. Shea bid $12.33 and $12.43, respectively, for delivering 1,710 tons of egg coal and 440 tons of chestnut coal to various Fire Department buildings.

F. M. A. Leach submitted a bid of $6.22 per ton for delivering 1,625 tons of semi-bituminous coal to the various fire boats.

For furnishing and delivering 404 tons of egg coal and 151 tons of pea coal to various police stations in Manhattan, W. J. Shea bid $12.69 and $10.59, respectively, and Intercity Fuel Co. bid $12.20 and $10.15, respectively. Other bids received for deliveries to individual police stations were: Commonwealth Fuel Co., $12.90 and $10.40, respectively; W. J. Howe & Co., $12.44 and $10.25, respectively; Fleer Coal Co., $12.25 and $10.50; Elmhurst Coal Co., $12.40 and $10.25. For delivering egg and pea coal to the police stations in Staten Island the bids received were as follows: S. Haber, $12.49 and $9.98, respectively; A. A. Smith & Co., $12.15 and $10.70, and McKee Coal Co., $12.74 and $9.90.

Department of Plant and Structures:

	Astoria Ferry 720 Tons Semi-Bitu.	39th St. 5,400 Tons No. 1 Buck.	St George 24,750 Tons No. 1 Buck.
Penn Fuel Co	$5 97	$5 94	$6 57
Coney Island Coal Co.	6 23	7 39	
Majestic Coal Co.	5 74	6 37	
W. J. Shea	6 21	5.96	5 96
Commonwealth Fuel Co	6 15	5 98	5 96
George D. Harris & Co.	5 63		
Intercity Fuel Co.	6 05	6 50	6 50

	Greenpoint Ferry Brooklyn 1,620 Tons No. 1 Buck.	Broadway Ferry Brooklyn 720 Tons No. 1 Buck.	College Point Ferry 540 Tons Semi-Bitu.
Penn Fuel Co.	$6 57	$6 57	$5 97
Coney Island Coal Co.			6 23
Majestic Coal Co.	6 39	6.39	5 84
W. J. Shea	5 96	5.96	6 27
Commonwealth Fuel Co.	5 98	5 98	5.92
George D. Harris & Co			5 68
Intercity Fuel Co.	6 50	6 50	6 08

Jerome Park Pumping Station, 820 tons each of buckwheat No. 3 and semi-bituminous—W. J. Shea, $6.13 and $7.19, respectively; Youngman & Co., $6.23 and $7.23, respectively.

Clove Pumping Station (Staten Island), 500 tons No. 1 buckwheat, and 2,000 tons No. 1 buckwheat to the Grant City Pumping Station—A. A. Smith & Co., $7.48; W. J. Shea, $7.48; Commonwealth Fuel Co., $7.53, and Youngman & Co., $7.48.

For delivering by barge to the 179th Street, Manhattan, pumping station 1,200 tons each of No. 3 buckwheat and semi-bituminous—W. J. Shea, $5.08 and $6.15, respectively; Commonwealth Fuel Co., $5.55 and $5.55, and Youngman & Co., $5.48 and $6.48.

Ridgewood Pumping Station, Brooklyn, 1,800 tons, semi-bituminous—W. J. Howe & Co., $5.79; Majestic Coal Co., $6.27; Commonwealth Fuel Co., $6.13; B. Nicoll & Co., $5.82; George D. Harris & Co., $6.08; Whitney & Kemmerer, $5.72.

Kings County Hospital, 3,715 tons of mixed coal (75 per cent buckwheat No. 3 and 25 per cent semi-bituminous slack)—W. J. Shea, $6.29; Commonwealth Fuel Co., $6.14, and Youngman & Co., $6.74.

Seaview Hospital, Staten Island, 3,750 tons mixed coal, same proportion as above—Penn Fuel Co., $7.35; W. J. Shea, $6.69; Commonwealth Fuel Co., $6.14, and Youngman & Co., $7.74.

City Hospital, barge delivery, 1,888 tons buckwheat No. 1—W. J. Shea, $5.82; Commonwealth Fuel Co., $6.03; Intercity Fuel Co., $6.26; Youngman & Co., $6.90, and Tuttle-Burger Corporation, $6.07.

For delivering 632 tons of semi-bituminous to the City Hospital; 2,050 tons semi-bituminous to Metropolitan Hospital and 1,409 tons semi-bituminous to the City Home on Blackwell's Island—Penn Fuel Co., $5.95, $6.35 and $5.95, respectively; Coney Island Coal Co., $5.46 each; Majestic Coal Co., $5.53 each; W. J. Shea, $5.87 each; Commonwealth Fuel Co., $5.93 each; George D. Harris & Co., $5.53 each; B. Nicoll & Co., $5.25 each; Intercity Fuel Co., $5.78 each; Whitney & Kemmerer, $5.41, 5.44 and $5.55; Tuttle-Burger Corporation, $6.09, $6.04 and $6.09, and Albert C. Gibson, $5.93 on second item.

Randall's Island, barge delivery, 2,934 tons mixed coal—W. J. Shea, $6.22; Commonwealth Fuel Co., $4.87, and Youngman & Co., $6.85.

	Willard Parker Hospital 1,500 Tons No. 2 Buck.	Riverside Hospital 1,500 Tons No. 2 Buck.
W. J. Shea	$5 39	$5.56
Intercity Fuel Co.	5 84	
Youngman & Co.	6.23	7.22

Health Department Building, Otisville, N. Y., 1,000 tons of stove coal—L. R. Wallace, $11.90, and Commonwealth Fuel Co., $10.09.

January Smokeless Output 140,543 Tons Less Than a Year Ago

PRODUCTION of West Virginia smokeless coals during January, 1922, totaled 2,687,432 net tons, which was 140,543 tons less than the total for the corresponding month of 1921. Winding Gulf was the only one of the four districts to register an increase in tonnage over the previous January, the gain being 87,662 tons. The decrease in production in the other three smokeless districts was as follows: Pocahontas, 132,760 tons; New River, 87,540 tons; Tug River, 7,905 tons. The output by districts was as follows, in net tons:

District	January, 1922	January, 1921
Pocahontas	1,281,380	1,414,140
Winding Gulf	584,182	496,520
New River	450,600	538,140
Tug River	371,270	379,175
Totals	2,687,432	2,827,975

Shipments of smokeless by the Norfolk & Western R.R. during January last amounted to 1,652,650 net tons; by the Chesapeake & Ohio Ry., 558,520 tons; Virginia Ry., 481,262 tons. These three railroads moved the following total coal tonnage by districts during January, 1922:

NORFOLK & WESTERN RY.	
Pocahontas District	1,281,380
Tug River District	371,270
Thacker District	381,620
Clinch Valley District	109,670
Kenova District	97,270
Total	2,241,210
CHESAPEAKE & OHIO RY.	
Logan District	1,065,830
New River District	553,520
Winding Gulf District	180,980
Kanawha District	175,770
Coal River District	128,720
Kentucky District	292,860
Total	2,397,680
VIRGINIAN RY.	
Winding Gulf District	403,202
New River District	78,060
High Volatile District	24,039
Total	505,301

Union Must Pay for Loss of Work Incurred By Member Suspended for Breach of Rules

THE first Circuit Court decision in the history of West Virginia mining involving the liability of a local union for damages for the suspension of a member has been handed down in the Circuit Court of Harrison County, in the case of E. H. Cubbons against the Lauralee Mine Local of Lumberport, W. Va., the plaintiff in this case receiving judgment for $187 and costs.

The case came before Circuit Judge Haymond on an appeal from a decision of a justice of the peace. Cubbons, an employee of the Hutchinson Coal Co., is said to have violated a union rule and was fined twice by his local and for the third alleged violation he was suspended. Following his suspension the mine superintendent was notified not to permit him to work any longer. The subdistrict board found that the local had gone beyond its authority in his suspension and though it ordered that the local reinstate him, it nevertheless fined him $15. After failing to obtain any redress from the subdistrict board he entered suit.

Illinois Miners' Wages Double Those of Non-Union Eastern Competing Fields

THE tremendous advantage in wages enjoyed by Eastern and Southern coal mines with which Illinois must compete for business is shown in a table just issued by Dr. F. C. Honnold, secretary of the Illinois Coal Operators' Association, Chicago, Ill. The wages in effect in Illinois up to April 1 averaged almost 100 per cent higher than the average of all the other fields in the comparison. The mean level for all rates except pick mining was 42.48c. for the Eastern fields as opposed to 81.26c. for Illinois, and this does not include the additional allowance which Illinois loaders in entries got for each yard such entry work was driven. The pick mining rate for Illinois was $1.08 per ton, mine-run basis, while Alabama paid from 50 to 74c., Harlan, Ky., paid 61c., and northeastern Kentucky, 55c.

The table makes plain one of the reasons why non-union coal has been able to go into the Midwest region during the past winter and sell at prices sometimes more than $1 under the rock bottom for local coal. It is hardly possible, however, that the difference in wages alone can explain why some Pocahontas mine-run coal sold in Chicago just after the middle of March for $1.05 f.o.b. mines. That can be more easily explained by the fact that some Eastern producers overshipped to the Chicago market and had to unload. However, current quotations of $1.40 were common during the winter and early spring while southern Illinois mine-run was offered in competition at $2.25@$2.75 and went at a loss when those prices were shaded in order to move the coal.

Some facts about probable production and demand during the strike are set forth in a memorandum attached to the wage table. From various mines which will continue to work uninterruptedly after April 1 and where labor wage scales are approximately identical with those given in the table, the weekly output, as estimated by the U. S. Department of Commerce, will be 4,000,000 tons, though various expert estimates set the figure at from 1,000,000 to 2,000,000 tons above that.

On the basis of an estimated normal consumption of 500,000,000 tons a year, the memorandum points out that the country's weekly requirements would be about 9,500,000 tons. Since it was estimated that there were 54,000,000 tons of coal above ground in storage when the table was issued, March 23, it was further pointed out that the country was supplied with only six weeks' normal supply of fuel or about 10 weeks' supply based on the present rate of consumption.

February Mine Fatalities Higher in Number And Ratio to Output Than Last Year

FATALITIES during February, 1922, in and about the coal mines of the United States, according to reports received by the Bureau of Mines from the various state mine inspectors, totaled 210, as compared with 160 killed in February, 1921, an increase of 50 fatalities, or about 31 per cent. Based upon an estimated output of 48,023,000 net tons in February, 1922, the fatality rate is 4.37 per million tons produced. The corresponding rate for February, 1921, was 4.15 and the production of coal was 38,552,000 tons. The production of coal during February, 1922, represents an increase of 25 per cent.

The average number of lives lost during February of each year from 1913 to 1921 has been 184. The production of coal has averaged 43,814,000 tons, showing a fatality rate of 4.20 per million tons as representative of the month of February for the past nine years.

During the first two months of the present year 364 men have been killed by accidents at coal mines against 357 killed during the corresponding months of 1921, an increase of 7 fatalities, or 2 per cent. The output of coal for the same months was 91,973,000 net tons in 1922 and 86,232,000 tons in 1921, an increase during the present year of 5,741,000 tons, or 7 per cent. These figures represent a fatality rate of 3.96 per million tons mined in 1922 and 4.14 in 1921.

On Feb. 2 nine men were killed by a gas explosion, due to open light, at the Belle Ellen Mine No. 2, at Belle Ellen, Ala., and on the same date 25 men were killed by a coal-dust explosion, due to shot, at Gates Mine No. 2, near Brownsville, Pa. On Feb. 7 nine men were killed by a coal-dust explosion, due to shot, at the Frick mine, at Pinson Fork, Ky.

COAL-MINE FATALITIES DURING FEBRUARY, 1922, BY CAUSES AND STATES

(Compiled by Bureau of Mines and Published by *Coal Age*)

State	Underground													Shaft					Surface							Total by States	
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal	Mine cars and locomotives	Gas explosions and burning gas	Coal dust explosions (including gas and dust combined)	Explosives	Suffocation from mine gases	Electricity	Animals	Mining machines	Mine fires (burned, suffocated, etc.)	Other causes	Total	Falling down shafts or slopes	Objects falling down shafts or slopes	Cage, skip or bucket	Other causes	Total	Mine cars and mine locomotives	Electricity	Machinery	Boiler explosions or bursting steam pipes	Railway cars and locomotives	Other causes	Total	1922	1921
Alabama	2			9		1		1					13													13	11
Alaska																										0	[illegible]
Arkansas																										0	[illegible]
Colorado		2	2										4						1						1	5	8
Illinois	7		5	1									13	1	1			2								15	21
Indiana	2		2					1					5													5	[illegible]
Iowa	1												1													1	[illegible]
Kansas																								1	1	1	1
Kentucky	7		1		9							1	18													18	9
Maryland																										0	[illegible]
Michigan																										[illegible]	0
Missouri	2												2													2	1
Montana																										[illegible]	0
New Mexico																										[illegible]	0
North Dakota	1												1													1	1
Ohio	7		3									1	11													11	10
Oklahoma						3							3													3	0
Pennsylvania (bituminous)	11	2	9		25	1		1	1	1			51			1		1					1		1	53	20
South Dakota																										0	[illegible]
Tennessee	5		1					1					7													7	1
Texas																										0	[illegible]
Utah		1	1										2													2	2
Virginia	2											1	3													3	4
Washington								1					1													1	0
West Virginia	19	2	9			1		1					32	1				1	1					1	2	35	23
Wyoming																										0	1
Total (bituminous)	66	7	33	10	34	5		6	1	1		3	167	2	1	1		4	2				1	2	5	176	124
Pennsylvania (anthracite)	10	2	8	3		2		1				4	30		1			1			3				3	34	36
Total, February, 1922	76	9	41	13	34	8		7	1	1		7	197	2	2	1		5	2		3		1	2	8	210	.....
Total, February, 1921	68	8	30	8	7	5		5	1	3		8	146		1			1	4		1		3	5	13	.....	160

Illinois Miner-Operator Conference Yields Nothing; Farrington Helpless

By E. W. Davidson

THE heralded conference of Illinois coal-mine operators and union miners was held in Chicago Wednesday, March 29. The executive committee of the three operators' associations and of the state miners' organization were there. They talked hesitantly an hour. They adjourned. That is the complete story of the meeting. The result was simply nothing. No move was made and no word spoken that could fairly be said to presage a wage settlement in Illinois. So Illinois mines closed down with the rest of those in the land affected by the strike of midnight March 31, and the deadlock continues.

The conference was in reality Frank Farrington's party. The request for it came from the Illinois mine-union president after he had stood up in the Cleveland meeting of the International union's policy committee a week earlier and declared he would try to make a separate wage agreement for Illinois as soon as the strike showed signs of weakening. Then, fulfilling his promise to the operators to meet with them before the strike, he marshaled the executive committee of his state organization and went to Chicago Wednesday. There was no official announcement of what took place behind the closed doors of that conference. The operators took the position that it was Farrington's meeting and that therefore he should say whatever he thought best about it. He said next to nothing about it.

The main events of the meeting were said to be these: (1) Farrington apologetically told the operators he could make no separate state agreement with them under any conditions because the International had decided against it and Illinois proposed to stick to the International. (2) The operators said they were sorry. (3) Farrington said he knew the miners' position was indefensible but that he had to maintain it until "an emergency arises." (4) The operators wanted to know what constituted an "emergency." (5) They did not learn. (6) Farrington reiterated his frequently made statement that although Illinois miners must strike with the rest they do it without bitterness toward the operators, and they hoped the time would come when they could meet the operators with the idea of making a new wage scale. (7) The operators said they would be glad to have him tell them when he is ready. (8) Adjournment.

A statement of the situation as it stood following the conference was issued by Dr. F. C. Honnold of the Illinois Coal Operators' Association. Here it is:

> The public will doubtless feel, as do the Illinois coal operators, that it is impossible to justify any further delay on the part of the miners in making a start toward the negotiation of a new wage agreement for the continuation of mine operation in Illinois. The Illinois miners' officials, however, still insist on the maintenance of the policy laid down by their national organization, which in turn demands that as a first consideration and before any further steps may be taken looking to negotiations, in any state, their precise wish shall be complied with as to the proper method to pursue.
>
> It is frankly admitted by the miners that Illinois coal operators have met promptly and fully every obligation, moral or otherwise, as well as every expressed wish of the national and state mine-workers' organizations, but regardless of all this and of the further fact that Illinois produces almost one-half of the output of the so-called Central Competitive Field; one-sixth of the total bituminous output of the entire country, and employs approximately one-fifth of the entire membership of the United Mine Workers, there can be no negotiations commenced in this state because certain other coal-producing districts have not felt warranted in agreeing to continue the so-called four-state conference method of negotiating.
>
> While holding no brief for the Pittsburgh and Ohio operators, whose combined annual output is only approximately two-thirds that of Illinois, we do not feel that any argument over their alleged violation of moral obligation justifies penalization of Illinois operators or the embarrassment of other districts and the public generally, and particularly in view of the fact that it is entirely understood by all that such a meeting would at best be an idle gesture and would in no manner change the situation which now confronts us.
>
> The big outstanding feature in the coal-mine labor situation today is that, regardless of any expense or inconvenience to the coal industry or the general public, the organized section of the mine labor of the country is arbitrarily demanding that its exact wish in the matter of mere procedure shall be fully and precisely met, entirely neglecting to remember that the major matter of concern to everyone is the prompt establishment of a basis upon which mine operation may continue so that as rapidly as may be possible every embarrassment to business revival may be removed.
>
> Illinois coal mines must have a competitive contract and wage scale. Such a contract must and will come, either by negotiation or economic attrition. This is not the threat of any employing group but the mere statement of an economic fact. If as a result of the refusal of Illinois miners to take such fair wages as will permit competitive movement of their product in the common market, Illinois mine operation must stop or be curtailed, and the ultimate appreciation of their present folly will none the less reach the miners with definite certainty.
>
> That 90,000 Illinois miners will be idle and their dependents denied possible comforts or necessities, and that the $250,000,000 invested in the producing coal industry of the state is compelled to close down next Friday night is absolutely not occasioned by Illinois coal operators. It is simply another manifestation of the exercise of the so-called economic power of organized labor, expressed through a strike or refusal to work, in order that their absolute dictum may be enforced.
>
> The closed shop in the Illinois coal industry is a matter of statutory provision. All organized union labor in the country does not exceed 10 per cent of the total working force.

No effort is to be made in Illinois to run mines there in defiance of the striking union miners. Under the law no man can work in the mines without a competency certificate and two years' experience underground. The hundreds of jobless men who are applying at mines and operators' associations therefore cannot be used, even though union mines in other states may go back to operation.

The miners of every one of the 1,035 Illinois mines that operated up to the last day of March left their work at the appointed time, taking their tools with them. There was no disturbance reported anywhere in the state. All tools were removed because the operators had given notice that they would not be responsible for any miner's property during the strike.

The very day the men quit Frank Farrington, Illinois union president, issued a statement warning his 90,000 men against certain inflammatory propaganda just then appearing in the southern counties of the state. Many miners affected to believe that this "red" literature was written and distributed by agents for operators, who hoped the strikers would commit enough acts of depredation to damage their cause in the public mind.

A great many operators who have headquarters in Chicago say the strike will run all summer and that the country might as well prepare for it. There is none to prophesy any more that 30 or 45 days will see the end of it.

The only general activity on the part of the Illinois miners on April 1, the first day of the strike, was a celebration at Sesser by the men of the three southern coal counties to mark the twenty-fourth anniversary of the eight-hour day for miners. This improvement in miners' working conditions was granted by operators April 1, 1898.

Central Pennsylvania Operators Post Protest; Brophy Asks Real Federal Probe

AT a meeting of the Central Coal Association held in Altoona on March 29 a resolution was passed instructing the operators in the central Pennsylvania field to post notices at their mining operations protesting against the strike order issued by the national officers of the United Mine Workers. The notice authorized in the resolution reads as follows:

> This company notifies its employees that it protests against the injustice to our employees, to the public and to ourselves of the strike order issued by the national United Mine Workers of America without our having an opportunity to discuss a new agreement effective from April 1. We are ready to meet our employees to discuss a new arrangement at any time.
>
> Our scale agreement with the United Mine Workers of America expires on March 31, 1922. The Central Coal Association, of which this company is a member, has repeatedly requested the U. M. W. of A. of District No. 2 for a conference to negotiate a wage agreement. The U. M. W. of A. of District No. 2 have refused to meet the operators of the Central Coal Association for that purpose.

John Brophy, president of District No. 2, United Mine Workers of America, issued a statement on March 29 and also sent a telegram to Representative John Nolan, chairman of the House Committee on Labor, calling upon the people and the government to make a real probe of the mining industry. He says in his statement that there has never been a real investigation of the coal industry. He says the American government has never tried to get full data from all the coal fields.

Central Pennsylvania and Pittsburgh Owners Post Reduced Wage Scale

WHILE the Central Coal Association, composed of operators in Cambria, Clearfield, Somerset, Blair, Huntingdon and Bedford Counties, Pennsylvania, has not formulated a wage scale to offer the miners, the Association of Bituminous Operators, whose membership is made up of operators in Indiana County and counties farther west, has posted notices announcing a scale effective April 1. The notice posted points out that the United Mine Workers has refused to enter into a wage scale conference and has declared a strike in violation of the wage scale agreement.

The scale, adopted at a meeting of the bituminous operators in Philadelphia last week, abolishes the check-off and fixes the rate of pay for pick mining at 86.24c. per gross ton and 77c. per net ton. The union scale which expired on April 1 fixed a rate of $1.1431 per net ton for pick mining. Loading is placed at 50c., which replaces the union scale at 77.29c. Mule drivers and other laborers are given a rate of $4.50 per day as against 82 to 93c. per hour.

Scales Posted in Central Pennsylvania and in Pittsburgh, Effective April 1, 1922:

TONNAGE MEN

	Central Pa.	Pittsburgh
Pick mining, per gross ton	$0.8624	....
Pick mining, per net ton	.77	Thin vein $0.77 Thick vein .68
Loading, per gross ton	.56	....
Loading, per net ton	.50	Thin vein .50 Thick vein .465
Cutting, per net ton, thin vein	....	.10
Cutting, per net ton, thick vein	....	.075

TIME WORKERS

(Per 8-hr. day)	Central Pa.	Pittsburgh
Cutters	$4.60	....
Scrapers	4.35	....
Motormen	4.60	$4.60
Motormen helpers	....	4.50
Spraggers	4.50	....
Skilled wiremen	4.50	4.50
Wiremen's helpers	4.25	4.25
Track layers	4.50	4.50
Track layers helpers	4.25	4.25
Bottom cagers	4.50	4.50
Drivers	4.50	4.50
Trip riders	4.50	4.50
Water and machine haulers	4.50	4.50
Timbermen (where employed)	4.50	4.50
Pipemen for compressed-air plants	4.00	4.00
Trappers	2.00	2.00
All other inside labor	4.00	4.00
Dumpers	4.00	4.00
Ram operators	4.00	4.00
Pushers	3.25	3.25
Trimmers	3.50	3.50
Car cleaners	3.25	3.25
All other outside labor	3.25	3.25

All yardage and dead work, 35 per cent below 1921 scale in the central Pennsylvania district and 30 per cent below 1921 rate in the Pittsburgh district.

Cutting and scraping where done other than by the day, 40 per cent below the 1921 scale in the central Pennsylvania district.

Car pushing, 35 per cent below the 1921 scale in the central Pennsylvania district.

Say Bank Deposits in Anthracite Region Increased 30 Per Cent in Two Years

DISCUSSION of what is a "living wage" and a "saving wage" took up most of the time devoted by the joint subcommittee of anthracite operators and mine workers in the second week of their efforts to agree upon a working agreement to take the place of the one which expired at midnight March 31.

When the conference ended on March 30, after sessions of four days, an adjournment was taken until Monday, April 3, and immediately afterward most of the miners' representatives left for their homes to see that there was no hitch in the arrangements made for the miners to quit work.

During the discussion of the demands relating to wage boosts it has been pointed out by the miners that many different rates exist throughout the anthracite districts for occupations of a similar nature and that the establishment of one rate for the same occupation would create harmony. Figures showing an increase in rents, taxes, etc., to offset any reduction in the price of foodstuffs also were presented by the miners.

The operators have not as yet indicated what they will demand in the way of a decrease in the mine workers' wages and it is said that they will not do so until after the miners' representatives have presented their arguments. The operators' representatives, it is said, have already presented statistics showing that bank deposits in the anthracite region have increased about 30 per cent in the past two years.

Operators' Position Misconstrued; Priority Applications Reach Washington

THERE is a general feeling among coal operators that their side of the labor controversy is not being presented by the daily press in a sufficiently comprehensive way to give the public a correct picture of their position. They realize that there is no intention on the part of reputable newspapers to misrepresent the situation, but it happens that the developments which appeal to the newspapers are those which, when standing alone, put the operators in a bad light. Moreover, the public does not differentiate between anthracite and bituminous coal. As a result sight is lost of the fact that the anthracite operators did meet their men in conference, and likewise the relatively high price of anthracite causes the great majority of people to overlook the fact that bituminous prices have declined greatly.

There is no great amount of public concern as to coal supply, and as a result the average person is not worrying. The fact that the buying power of no less than 550,000 men and their dependents is suddenly reduced very materially, however, is overlooked. The men now on strike represent 2 per cent of the able-bodied men of the country. This abrupt loss of buying power gives business, already sick, a jolt that it is in no position to withstand.

While the country has coal stocks sufficient to run it for nearly two months, even if no coal were mined, it is known definitely that these stocks are not evenly distributed. It is feared that once shipments from mines in union territory are suspended, it will develop that many consumers have inadequate storage facilities. Applications for priorities in transportation began reaching Washington before the strike. One large consumer wrote to Washington on the eve of the strike to the effect that his contracts were with union mines and that his plant is so situated that his current coal supply must be taken from aboard cars as needed. It is not known just how typical these cases are, but it is expected that an avalanche of complaints will be reaching Washington before the strike is two weeks old. While the operators express great confidence as to their ability to take care of distribution, there is no evidence of the machinery which will be essential to its handling. P. W.

No Decision on Proposed Reduction in Freight Rates Before April 15

THE decision of the Interstate Commerce Commission in the matter of a general reduction in freight rates, it now appears, will not be forthcoming before April 15. At present the case is being studied by the commissioners individually. If they should find themselves in substantial accord, the decision probably could be handed down as early as April 15, but should there be important differences between them, it obviously will extend the time required for the consideration of the case.

CARS LOADED WITH REVENUE FREIGHT during the week ended March 18 totaled 823,369 compared with 829,128 during the previous week, or a loss of 5,759 cars. This was, however, an increase of 131,973 cars over the corresponding week last year, but 31,691 under the corresponding year in 1920, according to report by the American Railway Association. Coal loading declined 13,885 cars compared with the week before, the total being 190,683. Compared with the corresponding week last year this was an increase of 64,715 and 8,728 more than were loaded during the same week in 1920.

Penna Quotes Harding: "When Operators Were Willing To Meet, the Miners Balked"; Miners' Assent Tardy

Lewis, Urging Government Control of Coal Mining, Says Any Regulation Must Be Applied Equally to All Mines and Fields, Not Aimed Only at Unionized Operations

IN a letter to John Hessler, president of District 11 of the United Mine Workers of America, made public April 2, P. H. Penna, secretary-treasurer of the Indiana Bituminous Coal Operators' Association, charges the miners with insincerity in their exploitation of the refusal of certain Eastern groups of operators to join in a wage-scale conference as a part of the Central Competitive Field and reveals that the miners themselves refused to participate in such a conference when they were invited to do so by the President of the United States last October. The letter recalls that the operators met with Secretary Hoover at Washington last October and agreed to meet the miners in joint conference, with a representative of the government present. Later the officers of the United Mine Workers met with President Harding at the White House and refused his request that they meet in joint conference.

Mr. Penna charges also that soon after the contract which has just expired was signed the miners refused to abide by it and a conference of the Central Competitive Field had to be called. This, it seems, resulted in a disagreement and the matter was settled by the individual states only after the contract was revised and further increases in pay were granted. In the letter Mr. Penna says:

"Last October the operators of the Central Competitive district agreed with Secretary Hoover, at his request, that we would meet in joint conference in the Central Competitive district at an early date for the purpose of making wage scales effective on or before April 1 for the purpose of avoiding a strike at this time. We had just the same right under the resolution to ask for and agree to a meeting at that time as the United Mine Workers had to select a time later. When our agreement had been secured by the Secretary you and your associates, including national officers, were advised by President Harding in person of the desirability of such meeting and were requested by him to meet at an early date with us. You refused for reasons known to you but not to us. President Harding tersely states it in a recent statement in which he said that 'When the operators were willing to meet, the miners balked, and when the miners were ready, the operators refused.'"

LEWIS FAVORS GOVERNMENT CONTROL OF MINES

John L. Lewis, president of the United Mine Workers of America, upon whose shoulders rests the responsibility of directing the nation's greatest coal strike, came out flat-footed April 2 for some form of government control of the nation's mines. He characterized as "significant" the suggestion of Senator Borah, of Idaho, that the government should operate the mines, and agreed that the suggestion was "fundamentally correct."

"I would say that some national authority over the coal-mining industry is necessary," said Mr. Lewis, "call it what you may. This does not necessarily mean government ownership, which I doubt could now be accomplished, because of the enormous amount of money that would be required to buy all of the mines and also because of the difficulty of finding a method of payment."

Mr. Lewis also indicated his approval of government control of mining by pointing out that the government already controlled the railroads through the Interstate Commerce Commission and other agencies. He insisted that any government control should compel the coal industry to care for men crippled or killed when at work, and also their dependents. He asserted that government control should also provide for a licensing system in the operation of the mines to prevent waste and eliminate haphazard mining.

"Any regulation must be applied equally to all of the mines of the country," he said. "It should not be aimed only at the now unionized mines, but should take in every field in the country, regardless of how it is now operated."

Mr. Lewis reiterated that union rail workers were not to be asked to join the miners in the strike. He said the miners' union would not be represented at the meeting of several rail union chiefs in Chicago April 3.

Confident that the suspension of coal mining in unionized fields would be effective in every mine when time for the first Monday morning whistle came, international officials of the United Mine Workers of America left the miners' headquarters in the Merchants' National Bank Building, in Indianapolis, smiling. Saturday, April 1, was celebrated as a holiday by the miners, commemorating the twenty-fourth anniversary of the inauguration of the eight-hour working day for the union coal-mine workers, and preliminary reports received at headquarters indicated that thousands of non-union miners had joined the union miners in celebrating the anniversary.

William Green, international secretary-treasurer of the United Mine Workers' organization, who announced his intention to spend the week-end and the first of next week at his home in Coshocton, Ohio, took issue with A. M. Ogle, of Terre Haute, president of the Vandalia Coal Co., in the latter's testimony in Washington April 1 before the House Labor Committee.

Colorado Not Seriously Hurt by Strike

OF 12,700 men employed in and around the mines in Colorado about 4,000 belong to the United Mine Workers union. For this reason operators do not think operations will come to a standstill under the most aggravated circumstances. Under an ordinary scheduled suspension 25 per cent of union men can be counted on to remain at work regardless of union orders, according to conclusions of operators.

Nineteen branch unions in Colorado may get into legal difficulties, if they have depended entirely on the 30-day notice necessary under the state law as sufficient grounds for cessation of work. The Colorado Industrial Commission, passing on the notices, declared that the necessary limit would not be complied with as of the date April 1.

In the bituminous field the Colorado Fuel & Iron Co., Victor-American Coal Co., Oakdale Coal Co. and the Sunnyside Coal Co. are the heaviest operators to be affected.

New York Utilities Well Stocked with Coal

PUBLIC-UTILITY corporations under the jurisdiction of the Public Service Commission of the State of New York have large reserve supplies of coal, according to reports made to the commission. Reports as of March 17 show that on an average the companies have about three months' supply of coal on hand and that this reserve is being rapidly increased.

The Consolidated Gas Co. of New York City has on hand 199,661 tons of anthracite and 287,805 tons of bituminous and its daily consumption calls for 1,574 tons of anthracite and 1,250 tons of bituminous. The reports show that the New York Edison Co. and subsidiaries has on hand 14,604 tons of anthracite and 255,994 tons of bituminous and that its daily needs are 134 tons of anthracite and 4,000 tons of bituminous.

Scotts Run Operators to Put in Effect 30-Per Cent Cut Announced Feb. 4

WHETHER their employees see fit to go to work or not, the members of the Monongahela Coal Association, comprising the owners of about 65 miles on Scotts Run and along the Monongahela River in Monongalia County, West Virginia, through their board of directors, on March 28 announced that the scale adopted at Pittsburgh, Pa., on Feb. 4 would become effective April 1, and that their mines, having an annual capacity of about 7,000,000 tons, would be operated under such scale at such a time as the mine workers saw fit to go to work. W. E. Watson, president of the association, says that the scale does not differ materially from that in effect in the non-union fields of Pennsylvania, being about 30 per cent less than the scale covered in the agreement expiring March 31, and that it gives no recognition to the check-off.

Officers of the International union as well as of District 17 have been informed of this action of the association.

World's Biggest Mines Run Mighty Race

A COLOSSAL contest of speed in blasting coal out of the earth and rushing it to the surface into railroad cars ended the night of March 31, when the miners of the land struck. In this mightiest race the coal industry ever saw Zeigler No. 1 mine of the Bell & Zoller Coal Co., at Zeigler, Ill., established the world's record for a month's hoist at 164,109 tons and its long-time rival only five miles away, Orient No. 1 of the Chicago, Wilmington & Franklin Coal Co., set the world's record for a single day's hoist at 8,218 tons.

These two mastodonic mines, with scouts watching each other across the few intervening miles of southern Illinois coal fields, exerted their herculean strength for every working day of the 27 in the month of March. Nothing interfered with the giants when they got into full stride. And the results were tremendous. They raced neck and neck all the way, first one taking the lead and then the other. Before the last loads reached the top works the evening of March 31 these two mines had literally pulverized all world's records and between them had raised 326,124 tons of coal, which filled 6,520 railroad cars—a train more than 60 miles long!

The Orient mine took the lead at the beginning of the month by digging, hoisting and dumping into cars a total of 5,645 tons. It was a big day's work as the miners judged big days at that time. The Orient held its lead the second day, increasing to 5,773 tons. By that time the men in Zeigler No. 1 were aroused. On the third day the Zeigler total was 6,073 tons. Everybody cheered—and went back to work. The Zeigler mine held the daily lead by a few tons until March 13, and on the 9th had broken the world's record with a hoist of 7,214 tons. That was considered phenomenal.

On the 14th Orient topped its rival by 20 tons for the day with a total of 6,012 tons. The very next day Zeigler nosed ahead. Then for two days Orient led. Zeigler on the 22d retaliated by breaking its own recently established world's record with 7,283 tons and held its daily edge for two days after that.

On the 25th Orient took a sporting chance, invited the town of Zeigler to come over and watch it—and then almost emptied the earth. It attained the monumental volume of 8,218 tons, which reduced all previous world's records to slack. On the 26th Zeigler led again with 5,349 and on the 27th dumped 7,537 tons through the tipple, setting its own "farthest North." Orient pushed ahead on the 29th. Its rival forged to the front on the 30th and on the last day, when miners were quitting by scores at the Zeigler property and by dozens at the other, Orient hoisted 6,235 tons and thought it was a trifling day's work. The race was over. The month's tonnages were: Zeigler, 164,109; Orient, 162,015.

Thus the coal industry saw a 27-lap race in which the world's daily record for coal hoisting was broken three times and the world's greatest monthly production—144,576 tons, hoisted by Orient in October, 1921, when the same two mines raced before—was beaten by the rival mine. Zeigler's greatest previous monthly output was 135,741 tons, in that other monthly race of October, 1921. During the contest just finished the Zeigler mine averaged 6,078 tons a day and the Orient, 400 lb. over 6,000 tons.

The records of daily production during the race are:

Date	Zeigler No. 1	Orient.
1	5,600	5,645
2	5,415	5,773
3	6,073	5,797
4	5,900	5,843
5	5,600	5,289
7	5,700	5,663
8	5,900	5,861
9	7,214	6,009
10	6,219	5,241
11	5,780	5,333
13	6,346	6,052
14	5,992	6,012
15	6,461	6,085
16	6,219	6,124
17	5,748	6,096
18	6,137	6,028
20	5,734	6,061
21	5,757	6,548
22	7,283	6,359
23	6,784	5,791
24	6,284	5,719
25	6,619	8,218
27	6,349	5,929
28	7,537	6,130
29	6,268	6,466
30	6,248	5,706
31	4,103	6,235
Totals	164,109	162,015

Editors Inspect Plants of Hudson Coal Co.

A PARTY of coal-trade paper editors were interested observers of the preparation methods of the Hudson Coal Co. March 29 on a trip through its plants as guests of the company. The party was composed of Mr. Bryan, of *Black Diamond;* Mr. Saward, of *Sawards Journal;* Mr. Hale, of the *Coal Trade Journal;* Mr. McNamara, of *Coal Trade Bulletin;* Mr. Ashmead, of *Coal Age*, and Mr. Coffey, of Ivy L. Lee and Associates.

Under the guidance of D. F. Williams, vice-president in charge of sales of the Hudson company, and assisted by Mr. Filmore and Mr. Surcliff, assistant sales managers, the party was taken in automobiles from the Hotel Casey, in Scranton, to the Loree preparator at Plymouth. From there the party went to the Baltimore No. 5 colliery, at Parsons, and then proceeded to the Pine Ridge breaker and watched the loading of box cars by the tilting box-car loader built by the Ottumwa Box-Car Loader Co. From Pine Ridge the party returned to Scranton and had lunch in the restaurant conducted by the company for its office employees. After lunch the party were taken to the new Marvine preparator, just north of Scranton. This preparator has been fully decribed in *Coal Age*.

After leaving Marvine the next stop was at the storage yards at Carbondale. Here the Hudson Coal Co. has 450,000 tons of chestnut and 100,000 tons of pea coal stored. The yard was supposed to have a normal capacity of 220,000 tons but there is two and a half times as much coal in it as it was designed to handle. The party then returned to Scranton and had dinner at the Scranton Club.

The visitors were much impressed by the extremely careful preparation given the coal as well as its inspection. The details of the inspection will be discussed in an early issue of *Coal Age*.

TRADE ASSOCIATIONS ARE SHOWING alarming signs of disintegration. It is hoped some action will be taken at the meeting called by Secretary Hoover for April 12 that will check this trend. There is no great amount of confidence, however, that the government will be able to check it. Just how far the process of disintegration has gone among the coal associations will be revealed at the annual meeting of the National Coal Association the latter part of May and at the convention of the American Wholesale Coal Association early in June. It is known that the entire abandonment of these associations will be proposed at that time. While such counsel is not likely to prevail, it is feared that their support will be decreased to such an extent as to greatly impair the ability of these associations to carry on their work.

Hearing on Bland Coal Commission Bill Provides General Airing of Coal Situation

WITH the Bland bill to establish a coal commission as the vehicle, the House Committee on Labor is riding through a maze of hearings on the coal situation. Beginning March 30, the committee set out to listen to everyone with a desire to discuss the situation. The hearings, which are proving a vehicle for labor publicity and a preliminary tryout of the issues before the public, are not expected by those in close touch with affairs in Washington to result in any constructive action.

The hearings opened on Thursday with the presentation of statistics of the Department of Labor on wages of coal miners and cost of living in coal-mining regions. A delegation of churchmen followed with a plea for a government commission to settle disputes over wages. Jack Moore, representing the United Mine Workers, followed. Director Smith and Mr. Tryon, of the Geological Survey, appeared on Friday and cleared up the maze of statistical misinformation presented the day before. On Saturday A. M. Ogle, president of the Vandalia Coal Co. of Indiana, introduced the first jarring note. The committee is heavily balanced in favor of the miners and Mr. Ogle stoutly defended the operators. John Lewis appeared on Monday, April 3.

Saturday's hearing was a contentious argument on the part of Representative Bland, of Indiana, author of the pending coal bill, with A. M. Ogle of Indiana. Bituminous coal operators were defended by Mr. Ogle for their refusal to meet with the miners' union in a national wage agreement. He advanced three reasons for their refusal: Disruption of the national agreement by the miners in their Cleveland convention in September, 1920, and their negotiation of separate agreements for an increased wage over that granted by the Bituminous Coal Commission; court decisions declaring national agreements unlawful, and economic conditions produced by competition of non-union mines.

Representative Bland proved an argumentative questioner until halted by Chairman Nolan after he had monopolized the entire morning.

OGLE SAYS MINERS VIOLATED WAGE CONTRACT

Mr. Ogle pointed out to the committee that the U. M. W. of A., "in open and illegal violation" of the two-year contract entered into on March 30, 1920, at New York, caused the miners in the summer of 1920 to strike in Indiana, Illinois, Ohio and, in fact, in nearly every union field. The miners, he said, struck for an advance in wages beyond that fixed by the Bituminous Coal Commission and upon which the wage contract agreement, which expired at midnight, March 31, had been based.

"At a conference of miners and operators called by the U. M. W. of A. officials at Cleveland in September, 1920," Mr. Ogle went on to say, "the miners, after threshing out their wage demands, adjourned the conference *sine die*. In a subsequent statement the *United Mine Workers' Journal*, the official organ, stated that the 'interstate joint wage-movement of the miners and operators of the Central Competitive Field, which was in successful existence for so many years, was disrupted by the joint conference at Cleveland.'

"After the conference had adjourned, the U. M. W. of A. officials turned the matter of negotiation over to the miners and operators of the different fields. It was through these state agreements that the strike was ended, with the advanced wage. From this it will be seen that the miners, having officially declared that the four-state conference was 'disrupted,' recognized state agreements as the effective means of dealing with the matter.

"The miners have been quibbling about this whole wage conference matter. Apparently there is a serious misunderstanding throughout the country as to the supposed obligation on the part of the operators to meet the miners in joint conference. The resolution adopted at the time the wage contract was negotiated in New York on March 30, 1920, can be taken only as an expression of hope that the miners and operators would be able to negotiate a new contract at the end of the two-year period. It was not a binding or a legal obligation. It was not a part of the contract as written by the government commission.

"Under all circumstances such a contract as is entered into between the miners and operators could be regarded as binding only during the time of its existence and there could be nothing that would compel one side, in the case of violation of the contract by the other, to be further bound by it. The miners flagrantly violated the conditions of the contract when they struck in 1920. That was a strike against the contract written by the government. The miners felt free to break it and they did so. When it was to their advantage they did not hesitate to break the agreement and it was done all over the country."

Mr. Ogle went on to explain that the operators stand ready in every union district in the country to meet the miners in state conferences. Overtures for these state conferences made by the operators in the Central Competitive and the outlying fields, Mr. Ogle said, have been abruptly turned down by the miners' representatives acting upon orders from the U. M. W. of A. headquarters at Indianapolis.

CITES LEGAL RISK OF JOINT WAGE CONFERENCE

"There is another phase of this situation that ought to be clearly understood," Mr. Ogle went on. "A number of operators in the Central Competitive districts have been indicted for having participated in joint wage conferences exactly of the nature of the conference that the miners are now insisting upon. Many of these operators have been advised by their counsel that to participate in a joint wage conference might prejudice the cases against them at Indianapolis. For that reason they have felt that it was dangerous to go into such a conference. To expect operators to enter into a joint conference in face of the advice of their own counsel that they would do so at their peril appears to be, to say the least, unreasonable.

"Aside from this phase of the situation, competitive conditions have changed within the last two years so as to make a joint wage conference of operators and miners upon which a wage scale would be negotiated, not only for the Central Competitive Field but the outlying fields, economically impracticable. Operators in Pennsylvania, Ohio, Indiana and other fields have felt the effect of lower wages and consequent lower production costs at the non-union mines, so that to enable them to produce coal at anything but a loss they must have a readjustment of wages. The majority of mines in the Central Competitive Field in the last year have operated at a loss and many of them have been closed down for a considerable period of time.

Asked by Representative Bland as to how long the reserves would last the country, Mr. Ogle replied: "I do not know that, but the country need have no concern about its coal supply. It is inconceivable that the strike may go on for such a period of time as to inconvenience the public. Long before that time arrives the miners, I am convinced, will meet the operators in the different districts and the strike will come to an end. Eventually the whole dispute must be settled in the districts, and that is what will happen."

A mass of statistics on operation of coal mines, wages, cost of living, etc., was submitted by Ethelbert Stewart, Commissioner of Labor Statistics of the Department of Labor. These included the data on the earnings of bituminous coal miners recently published as a Senate document and also similar data from the anthracite region. These data are based on investigations conducted from Oct. 1, 1921, to March 1, 1922. Average earnings in 1921 were estimated by Mr. Stewart at $1,357.40. Pick miners, working 168 days, earned $1,088.64; machine run-

WAGES, BITUMINOUS COAL MINERS

Summary for pick miners, machine miners, and loaders combined in one group.

Number of mines reporting	200
Number of pick miners, machine miners, and loaders in mines covered	33,396
Average per capita number of starts in half month covered	8.8
Number of days of operation during year ending Oct. 31, 1921, for mines covered:	
Average number of days	195.7
Highest number of days in any mine covered	310
Lowest number of days in any mine covered	71
Estimated average earnings during year, assuming each person to have worked every day of operation and to have earned as much per turn as during the pay period taken	$1,357.40

Summary of number of mines and employees, average number of starts (days), and average hours and earnings, bituminous coal mines, by occupation, 1921 and 1922.

TONNAGE WORKERS

			Hours				Average Earnings				
			Average Hours Worked in Half Month		Average Hours per Start Based on						
Occupation	Number of Mines	Number of Employees	Average Number of Starts (Days) Made in Half Month	Time at Face Including Lunch	Total Time in Mine	Time at Face Including Lunch	Total Time in Mine	In Half Month	Per Start (Day)	Per Hour Based on Time at Face Including Lunch	Per Hour Based on Total Time in Mine
Miners, hand or pick	127	8,429	9.2	71.9	78.4	7.8	8.5	$59.66	$6.48	$0.829	$0.761
Miners, machine	158	2,356	9.5	73.8	79.8	7.8	8.4	96.00	10.09	1.300	1.202
Loaders	176	22,611	8.6	66.2	71.4	7.7	8.3	59.65	6.91	0.901	0.835

TIME WORKERS

				Average Hours		Average Earnings		
Occupation.	Number of mines.	Number of employees.	Average number of starts (days) made in half month (a).	Worked in half month.	Per start. (a)	In half month.	Per start (day). (a)	Per hour.
Inside:								
Brakemen	181	1,333	9.4	77.3	8.2	$60.18	$6.41	$0.779
Bratticemen	181	986	10.4	85.7	8.1	70.26	6.81	0.820
Cagers	83	185	10.3	89.4	8.6	77.82	7.53	0.871
Drivers	125	2,080	9.5	78.7	8.2	64.84	6.82	0.824
Laborers	181	2,965	9.9	80.9	8.0	56.34	5.73	0.697
Motormen	183	1,298	10.0	84.1	8.4	68.52	6.82	0.815
Pumpmen	157	452	13.0	110.2	8.5	80.90	6.24	0.734
Trackmen	198	1,393	10.7	87.3	8.2	72.05	6.77	0.826
Trappers (boys)	103	393	9.1	72.3	7.9	34.09	3.75	0.472
Other employees	188	2,295	10.9	91.3	8.3	75.46	6.97	0.826
Outside:								
Blacksmiths	191	339	11.7	102.0	8.6	87.42	7.47	0.857
Carpenters	157	427	11.1	94.7	8.4	71.23	6.42	0.752
Engineers	129	267	13.9	121.3	8.7	99.50	7.21	0.820
Firemen	79	327	13.9	117.1	8.5	87.24	6.48	0.745
Laborers	195	2,406	10.1	84.8	8.4	55.08	5.49	......
Other employees	193	2,242	11.8	101.3	8.5	70.02	5.96	0.691

(a) Not including starts or earnings of small groups of employees whose starts were not reported, the groups comprising from 2 cagers to 237 inside laborers.

Number of mines and employees, average number of starts (days), and average hours and earnings, in bituminous coal mines, by occupation and state, for year ending Oct. 31, 1921.

TONNAGE WORKERS

				Number of Days of Operation During Year			
State.	Number of mines.	Number of loaders, pick miners and machine miners (combined)	Average number of starts made in half month.	Average.	Highest.	Lowest.	Estimated average earnings during year, based on days of opportunity for work.
Alabama	10	2,453	8.6	223.1	280	128	$929.88
Colorado	8	1,094	9.7	199.9	232	161	1,559.86
Illinois	22	6,539	9.3	194.3	255	107	1,709.64
Indiana	12	2,114	8.2	170.4	241	95	1,392.57
Kentucky	20	3,031	8.7	205.1	275	71	1,202.38
Ohio	25	3,520	8.8	185.0	274	87	1,417.00
Pennsylvania	44	9,252	8.9	196.9	310	95	1,197.97
Utah	4	483	5.4	177.7	231	118	1,342.16
Washington	4	319	10.5	188.4	224	118	1,687.61
West Virginia	47	4,222	8.5	193.3	291	78	1,301.43
Wyoming	4	370	10.1	226.2	287	190	2,210.93
Total	200	33,397	8.8	195.7	310	71	$1,357.40

ners, $1,695.12; loaders, $1,160.08, an average of $1,180.34 for skilled men, he stated.

Summaries from Mr. Stewart's statistical report are reproduced on this and other pages.

Mr. Stewart gave cost of living statistics for the following bituminous coal mining towns: Belleville, Pana and Herrin, Ill.; Clinton, Ind.; Nelsonville, Bellaire and New Philadelphia, Ohio; Barnesboro, Carnegie and Uniontown, Pa., and Clarksburg and Montgomery, W. Va. These figures covered 25 families in each town 206 of whom were miners' families and 53 non-miners' families.

The average income from all sources of the miners' families was $1,590.65; for non-miners' families, $1,686.11. The average total expenditures for miners' families was $1,785.86 ad for non-miners', $1,645.92. There were 76 miners' families who had an average surplus of $228 and 23 non-miners' families who had an average surplus of $284. There were 146 miners' families having a deficit averaging $312, and 22 non-miners' families a deficit of an average of $200. Of miners' families 24 had neither a surplus nor deficit and 8 non-miners' families were in the same position. The average deficit for the miners' families was $115, and of the non-miners' $40.

For 8 of these 12 cities, Mr. Stewart said, the cost of living, after allowing for increases in rents, fuel and light, had decreased 18.01 per cent from February, 1920, to March, 1922, with no decrease in union wages, although there had been decreases in non-union wages.

Representative Black, of Texas, said it was a baffling economic question, as the public was forced to pay high prices for an overdeveloped industry in order that workmen might make enough in half a year to keep them a full year and to enable the operators to earn a reasonable profit.

Director Smith, of the Geological Survey, and F. G. Tryon, its coal statistician, appeared on Friday and gave information as to stocks of coal. While coal stocks were estimated to last 43 days, Mr. Tryon said some consumers might have 100 days' supply and others less and that surplus stocks could not all be consumed before a shortage could occur. He referred to the 1920 panic caused by low stocks of coal. Anthracite stocks were given as 28 days' for the country or 39 days' for New England, while the Northwestern docks would have more coal this spring than heretofore. Mr. Tryon estimated that on April 1 the stocks could be estimated to last 51 days. Representative Bland referred to conflicting reports that mines were actively producing, anticipating the strike, while other reports showed no production. Mr. Tyron said that production had not reached the maximum of the record production in July, 1918, and before the 1919 strike, the recent highest production being 2,000,000 tons less a week than the highest previously reported. Many mines have closed down for lack of market, which he said might be termed lack of profit.

After John L. Lewis, president of the United Mine Workers, had spent practically the entire day before the committee reading a prepared statement, a few questions were asked before adjournment Monday which put Mr. Lewis on the defensive. The questions were propounded by Representative Black, of Texas, one of the few members of the committee who seems to be willing to bring out any information which might embarrass the mine workers. Not only was it brought out very clearly that the mine workers had declined repeatedly to enter district conferences but much of the effect of Mr. Lewis' carefully prepared argument for nationalization and government control was undermined when Mr. Black drew him out as to whether this is to mean governmental fixing of prices, wages and working conditions.

Strike Is Practically Complete in Union Fields; Non-Union Areas Not Affected

UNION mines in every district responded on April 1 to the strike call of President Lewis, early reports indicate. As *Coal Age* goes to press on Tuesday, telegraphic advices from all parts of the country are to the effect that non-union fields are but little affected. It should be realized that a full week must elapse and an inventory of actual production be had before the actual facts will be available.

One thing is clear at the outset and that is that there has been no general exodus of non-union workers. Here and there disaffections are disclosed in what were commonly supposed to be unorganized areas, but these are of minor importance.

West Virginia is largely non-union. Such districts as Pocahontas, Tug River, Kenova-Thacker and Logan are entirely unaffected. Winding Gulf is reported to be working 90 per cent, but New River is practically closed down.

In the Kanawha district reports vary, but show from 12 to 23 mines working. The Fairmont region, a closed-shop district, reports that of 136 mines in Harrison County, 95 mines in Marion County and 33 mines in Taylor County, a total of 264 mines, 18 were working open shop on Monday, April 3. In this region approximately 17,000 men are on strike.

In the Monongalia region from Parkers Run, W. Va., to Point Marion, Pa., no men were at work. Elsewhere in northern West Virginia there were few mines at work on Monday. Seven mines on the Morgantown & Kingwood R.R., one mine on the Cumberland division of the Baltimore & Ohio and five mines on the West Virginia Northern R.R. remained at work.

The situation in the Upper Potomac region may be briefly stated. Reductions in wages have previously been effected here. There is an agreement between the local union and the operators providing for a 90-day period after April 1 for negotiations without suspension. This is being observed and the miners are working. In Georges Creek the mines on the Big Vein are working, while those on the thin veins are closed.

The Connellsville, Uniontown and Johnstown regions, all non-union, are working, save that four mines of the H. C. Frick Co.—the Gates, Ronco, Edenborn and Lekrone properties—were closed by a strike. Somerset County and adjacent non-union districts are reported working full, with the exception of 100 men at St. Michaels.

Northeastern Kentucky is working, as is southwestern Virginia. In Tennessee about half the mines that were operating in March are closed.

Kanawha Operators Draft New Scale Embodying 30 Per Cent Wage Cut

KANAWHA coal operators on Wednesday, March 29, approved a new scale of wages, effective April 1. This scale covers eight coal-producing counties in southern West Virginia and calls for a reduction in wages of about 30 per cent.

The attitude of the operators toward the check-off is defined in notices posted at all of the 221 mines in the field on April 1, as follows: "There will be no check-off for union dues, but there shall be no discrimination against anyone belonging to a union nor against anyone not belonging to a union."

The official notice to the miners, posted at all the mines, setting forth the new rates of pay was as follows:

"The officials of the United Mine Workers having declined to meet with the Kanawha Operators Association to negotiate a contract effective after March 31, 1922, and recognizing the necessity for a scale to be effective April 1, we submit the following scale of wages to be in effect at this mine until further notice:

GAS SEAM

	Per Ton
Machine loading	43c
Machine loading in entries	48c
Machine cutting in rooms and entries	10c.

DAY LABOR

	Per Hour
Drivers—one mule	55c
Drivers—two mules	57c.
Tracklayers	57c.
Tracklayer helpers	53c.
Slate shooters	54c.
Greasers, boys	29c
Trappers, boys	29c
Old men trappers	40c
Spraggers and couplers	32c.
Motormen and machine runners	58c
All other inside day labor	53c

In reference to the demand that the Kanawha operators wait until an agreement had been reached in the Central Competitive Field, C. A. Cabell, president of the Association, in a formal statement said:

"It is all very well for the union leaders to tell the miners and operators of southern West Virginia that they must wait until after a satisfactory arrangement has been made in the Central Competitive Field concerning the rules and regulations and rates of pay under which the mines may be operated. But the operators in the Kanawha field are cognizant of the fact that they owe a duty to their workmen and to the community as a whole, in which the officers of the union at Indianapolis have not the slightest interest.

"Therefore with the old wage agreement terminating Friday night, the Kanawha Operators Association deemed it imperatively necessary to take action to provide a new scale in order that the 221 mines in this district might be in a position to produce coal, providing work for the miners who are the backbone of this community."

Asks Modification of Hardwood Decree

REHEARING of the open price association practice in trade or modification of the decree in the Hardwood case to permit of the collection and dissemination of production, sales and stock reports have been requested of the U. S. Supreme Court in a petition filed by the American Column & Lumber Co., the defendant in the recent suit in which the court decided the practice was illegal because in violation of the anti-trust law. The lumber interests base their request on misinterpretation of certain phases of the case, and make general denial of the conclusions of the court that the purpose of the practice employed by the lumber interests was to curtail production or enhance prices.

IN A SENATE DEBATE on the Calder resolution seeking information on bituminous coal from the Federal Trade Commission, Senator Borah, of Idaho, said he understood it called for an investigation by the commission of the cost of production, ownership of mines, profits, etc., and was under the impression that the commission already had this information, and Senator Calder understood it had most of the data. "I think they have all the information the Senator wants," Senator Borah added; "that is my opinion from my talk with them." Mr. Calder said it was his expectation that the commission would report to the Senate what information it had.

IN THE HOUSE, Representative Browne, of Wisconsin, made an extended speech criticising the operators for failing to confer with the miners and charging that 75 per cent of the entire coal industry was controlled by the railroads, banking and steel interests. He denied that the public would receive any benefit from reduced coal wages, and charged the industry with exacting exorbitant prices during the war.

Production and the Market

Weekly Review

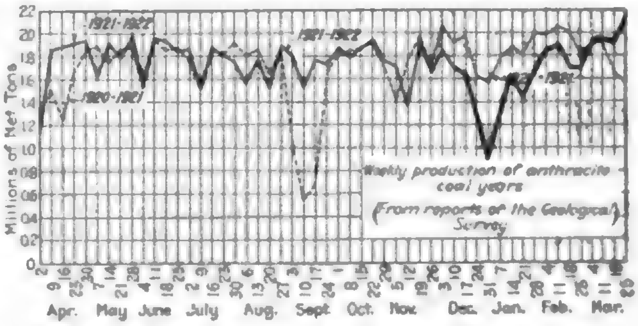
FACING an indefinite shutdown of union mines, bituminous coal production spurted late in March to the highest level attained since December, 1920. A few buyers took some additional stocking precautions on the eve of the strike. This buying movement was confined to smaller consumers who had kept out of the market recently, until at the last moment they were stirred into some action by the strike reality. Railroads, utilities and the larger steam consumers had generally filled their needs before the month came to a close and the last-minute stimulation to the demand failed to overtake the available supply, but succeeded in checking the recent decline in spot prices. *Coal Age* Index of prices stands at 171 on April 3, as compared with 170 on March 27.

Freight Rates Divide Interest With Strike

Impending freight rate changes, announcement of which is hoped for in the near future, occupied as much interest in the market last week as the strike talk. "All set for the strike" was the most common phrase heard from consumers, large and small. Industrial users refused to be budged from their deliberate attitude, reassured by the comfortable supplies on hand and the heavy non-union tonnage offering. Coal of this variety has been growing progressively more difficult to sell during the last three or four weeks and some non-union mine closings have been reported, due to lack of orders.

The bulk of the tonnage left at the mines was domestic coal, which has been practically unsalable recently, screened out to meet the comparatively lively call for small sizes. Due to its distressed position, much of this clean coal is being sold for steam purposes. Not for twenty years have Lake inquiries been so tardy. Some of this business has just appeared, but buyers are only interested in "wide-open" contracts, assuring them tonnage when it may be needed, and even now no prices have been settled for April delivery. For the season to April 1 only 4,000 cars have been moved to lower ports, as compared with 6,046 at that time last year. Practically all of this is for the account of docks having affiliated mine connections—an outlet for excess production—and is not indicative of any interest in the Lake market.

Only a slight impetus was noticeable in the anthracite market, due to fill-in orders by dealers who were desirous of taking some additional tonnage at the last moment. Retail stocks are adequate for the balance of the season, no-bills and storage piles are heavy in the hard-coal region and the strike opened with no price stimulation, either for domestic or steam grades.



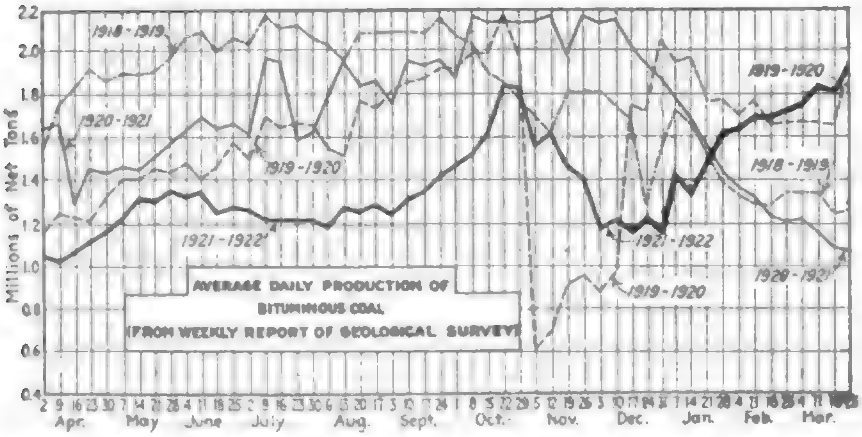
Weekly production of anthracite coal years

(From reports of the Geological Survey)

BITUMINOUS

Production reached 11,437,000 net tons in the week ended March 25, as compared with 10,846,000 tons in the preceding week. In anticipation of the strike, the output was carried nearly 400,000 tons ahead of the peak last October, when a railroad strike was threatening, and was the largest of any week since December, 1920. Reports of loadings for the first two days of the last week in March indicate that there was a further spurt in production. During the last few days prior to April 1 union mines loaded every car available and mine sidings and railroad yards are heavily laden with coal awaiting a market.

Based on the weekly figure of current needs and ship-



AVERAGE DAILY PRODUCTION OF BITUMINOUS COAL

(FROM WEEKLY REPORT OF GEOLOGICAL SURVEY)

Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1921—1922	1920—1921
March 11 (b)	11,102,000	6,900,000
March 18 (b)	10,846,000	6,512,000
March 25 (a)	11,437,000	6,457,010
Daily average	1,906,000	1,013,000
Coal year	423,363,000	516,508,000
Daily av. coal yr.	1,410,000	1,706,000

ANTHRACITE

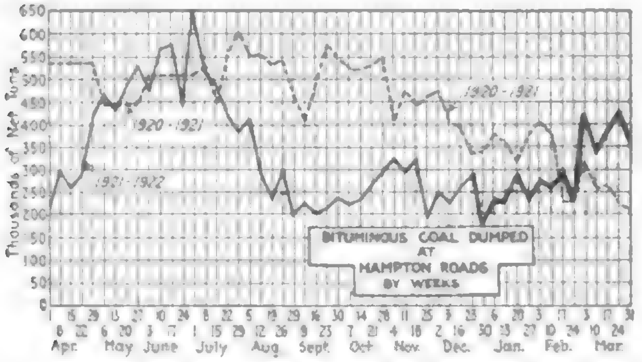
March 18	1,907,000	1,687,000
March 25 (a)	2,095,000	1,564,000
Coal year	85,263,000	88,722,000

COKE

	1922	1921
March 18	149,000	118,000
March 25 (a)	167,000	93,000
Calendar year	1,610,000	2,468,000

(a) Subject to revision. (b) Revised from last report.

ment abroad—8,300,000 tons—the week's production added at least 3,000,000 tons to consumers' stock piles, confirming the Geological Survey's forecast that coal stocks on April 1 would be around 63,000,000 tons, the amount held at the time of the armistice, which was the heaviest on record. The present reserve tonnage, however, covers a longer period of fuel requirements, as industrial activities are much behind those prevailing at the time of the armistice. Non-union suppliers can be counted upon to fill more than 50 per cent of the country's current needs, and this tonnage augmenting the consumers' stocks removes the probability of a shortage so far into the future that it fails to become an immediate market factor.



All-rail movement to New England declined to 3,369 cars during the week ended March 25 from 4,064 cars in the preceding week. The tonnage was largely on contract, as there is only a very restricted territory for these coals, due to the good competitive position of the Hampton Roads shippers. New England is well supplied with fuel and the outlook is not bright for the coal man for some time, as current requirements have been materially reduced by the spread of the textile strike.

Hampton Roads dumpings for all accounts were 358,084 net tons during the week ended March 30, as compared with 422,420 tons in the previous week. Accumulations of coal at the piers is heavier.

ANTHRACITE

Production of hard coal increased sharply during the week ended March 25. According to the Geological Survey the output was 2,095,000 net tons, as compared with 1,907,000 tons in the preceding week. This tonnage is close to the maximum for the region.

The eve of the strike failed to produce any buying flurry, although there was a better market, due to the efforts of

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

	Market Quoted	Mar. 6, 1922	Mar. 20, 1922	Mar. 27, 1922	April 3, 1922†
Low-Volatile, Eastern					
Pocahontas lump	Columbus	$3.20	$3.05	$2.75	**$2.90@$3.00**
Pocahontas mine run	Columbus	1.85	1.85	1.75	**1.70@ 1.95**
Pocahontas screenings	Columbus	1.35	1.15	1.25	*1.10@ 1.25*
Pocahontas lump	Chicago	3.15	3.15	2.70	*2.60@ 2.75*
Pocahontas mine run	Chicago	2.00	1.85	1.35	1.25@ 1.50
Pocahontas lump	Cincinnati	3.15	2.85	2.75	**2.75@ 3.00**
Pocahontas mine run	Cincinnati	1.75	1.70	1.70	**1.75**
Pocahontas screenings	Cincinnati	1.15	1.15	1.15	**1.25**
*Smokeless mine run	Boston	4.65	4.55	4.55	4.50@ 4.65
Clearfield mine run	Boston	1.95	1.95	1.95	1.65@ 2.25
Cambria mine run	Boston	2.45	2.45	2.45	2.25@ 2.60
Somerset mine run	Boston	1.90	1.90	1.90	1.75@ 2.00
Pool 1 (Navy Standard)	New York	3.00	2.85	2.85	2.75@ 3.00
Pool 1 (Navy Standard)	Philadelphia	3.05	3.00	2.80	2.65@ 3.00
Pool 1 (Navy Standard)	Baltimore	2.70	2.65	2.65	**2.65@ 2.75**
Pool 9 (Super. Low Vol.)	New York	2.50	2.30	2.25	2.10@ 2.40
Pool 9 (Super. Low Vol.)	Philadelphia	2.45	2.35	2.15	1.90@ 2.40
Pool 9 (Super. Low Vol.)	Baltimore	2.30	2.15	2.25	**2.25@ 2.35**
Pool 10 (H. Gr. Low Vol.)	New York	2.10	1.90	2.10	*1.85@ 1.90*
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.10	2.10	1.90	1.70@ 2.10
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.15	2.10	2.15	**2.15@ 2.20**
Pool 11 (Low Vol.)	New York	1.75	1.70	1.80	1.60@ 2.00
Pool 11 (Low Vol.)	Philadelphia	1.75	1.75	1.70	**1.60@ 1.90**
Pool 11 (Low Vol)	Baltimore	1.95	2.05	2.05	**2.05@$2.15**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.60	1.50	1.55	**1.50@ 1.70**
Pool 54-64 (Gas and St.)	Philadelphia	1.50	1.50	1.40	**1.40@ 1.60**
Pool 54-64 (Gas and St.)	Baltimore	1.55	1.55	1.55	**1.55@ 1.65**
Pittsburgh sc'd. Gas	Pittsburgh	2.70	2.65	2.65	2.60@ 2.70
Pittsburgh mine run (St.)	Pittsburgh	2.15	2.00	1.85	1.80@ 1.90
Pittsburgh slack (Gas)	Pittsburgh	1.65	1.55	1.55	1.50@ 1.60
Kanawha lump	Columbus	2.50	2.30	2.30	**2.25@ 2.45**
Kanawha mine run	Columbus	1.60	1.50	1.50	*1.35@ 1.60*
Kanawha screenings	Columbus	1.30	1.45	1.35	1.30@ 1.35
W. Va. Splint lump	Cincinnati	2.25	2.15	2.15	2.00@ 2.25
W. Va. Gas lump	Cincinnati	2.00	1.85	1.95	**2.00@ 2.15**
W. Va. mine run	Cincinnati	1.35	1.40	1.35	**1.25@ 1.50**
W. Va. screenings	Cincinnati	1.30	1.30	1.30	1.25@ 1.35
Hocking lump	Columbus	2.65	2.60	2.55	2.40@ 2.70
Hocking mine run	Columbus	1.90	1.75	1.75	1.65@ 1.90

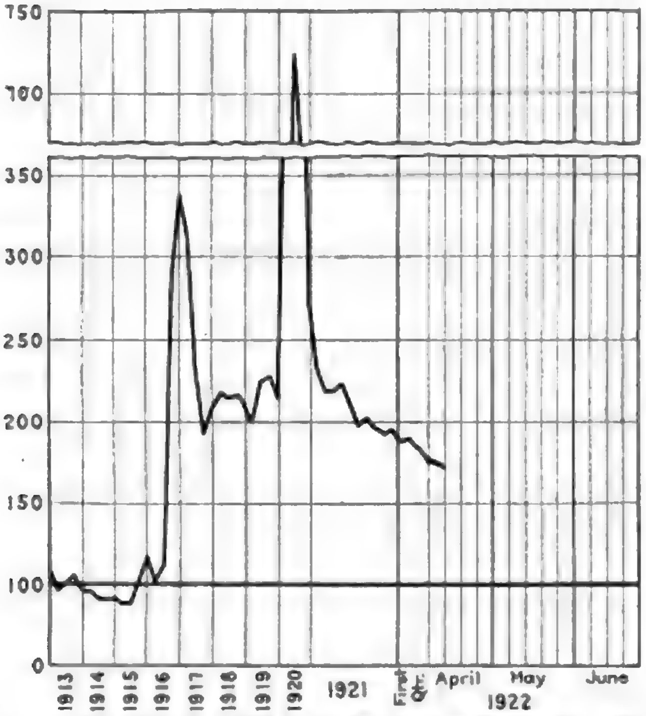
	Market Quoted	Mar. 6, 1922	Mar. 20, 1922	Mar. 27, 1922	Apr. 3, 1922†
Hocking screenings	Columbus	$1.45	$1.55	$1.45	**$1.40@$1.65**
Pitts. No. 8 lump	Cleveland	3.10	2.90	2.80	*2.50@ 3.00*
Pitts. No. 8 mine run	Cleveland	2.00	1.90	1.85	*1.75@ 1.85*
Pitts. No. 8 screenings	Cleveland	1.80	1.70	1.70	*1.60@ 1.65*
Midwest					
Franklin, Ill. lump	Chicago	3.25	3.40	3.25	**3.00@ 3.65**
Franklin, Ill. mine run	Chicago	2.50	2.50	2.25	**2.25@ 2.50**
Franklin, Ill., screenings	Chicago	2.00	1.95	2.00	**1.85@ 2.25**
Central, Ill., lump	Chicago	3.00	2.80	2.60	2.50@ 2.75
Central, Ill. mine run	Chicago	2.35	2.35	2.25	2.10@ 2.40
Central, Ill., screenings	Chicago	1.75	1.75	1.85	1.75@ 2.00
Ind. 4th Vein lump	Chicago	3.25	3.15	3.15	3.00@ 3.25
Ind. 4th Vein mine run	Chicago	2.50	2.45	2.35	2.25@ 2.50
Ind. 4th Vein screenings	Chicago	2.15	2.00	2.15	2.00@ 2.25
Ind. 5th Vein lump	Chicago	2.80	2.80	2.85	*2.50@ 2.75*
Ind. 5th Vein mine run	Chicago	2.35	2.20	2.20	2.10@ 2.35
Ind. 5th Vein screenings	Chicago	1.65	1.60	1.75	1.65@ 1.90
Standard lump	St. Louis	2.60	2.55	2.45	**2.50@ 2.75**
Standard mine run	St. Louis	1.95	1.80	1.85	*1.75@ 1.85*
Standard screenings	St. Louis	1.10	1.10	1.35	**1.40@ 1.50**
West. Ky. lump	Louisville	2.45	2.35	2.35	2.00@ 2.25
West. Ky. mine run	Louisville	1.85	1.75	1.75	**1.75@ 1.90**
West. Ky. screenings	Louisville	1.80	1.45	1.60	**1.60@ 1.75**
South and Southwest					
Big Seam lump	Birmingham	2.60	2.60	2.10	*2.00*
Big Seam mine run	Birmingham	1.85	1.85	1.85	*1.60@ 1.90*
Big Seam (washed)	Birmingham	1.85	1.85	1.85	1.75@ 2.00
S. E. Ky. lump	Louisville	2.45	2.10	2.10	**2.15@ 2.30**
S. E. Ky. mine run	Louisville	1.55	1.60	1.55	1.50@ 1.60
S. E. Ky. screenings	Louisville	1.30	1.30	1.40	1.25@ 1.50
S. E. Ky. lump	Cincinnati	2.25	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run	Cincinnati	1.40	1.45	1.30	**1.35@ 1.45**
S. E. Ky. screenings	Cincinnati	1.20	1.25	1.25	**1.25@ 1.35**
Kansas lump	Kansas City	5.00	5.00	4.50	4.00@ 5.00
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in heavy type, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	March 20, 1922		March 27, 1922		April 3, 1922†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	$2.61	....	$7.60@$7.75	....	$7.60@$7.75	....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.00@$7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.85	$7.00@$7.50	7.75@ 7.85
Egg	New York	2.61	7.35@ 7.75	7.60@ 7.75	7.60@ 7.75	7.60@ 7.75	7.60@ 7.75	7.60@ 7.75
Egg	Philadelphia	2.66	7.15@ 7.75	7.75	7.25@ 7.75	7.75	7.25@ 7.75	7.75
Egg	Chicago	5.63	*7.50	*6.90@ 7.40	*7.50	*6.95@ 7.40	*7.50	*6.95@ 7.40
Stove	New York	2.61	7.75@ 8.00	7.90@ 8.10	7.90@ 8.10	7.90@ 8.10	**7.90@ 8.20**	7.90@ 8.10
Stove	Philadelphia	2.66	7.85@ 8.15	8.05@ 8.25	7.85@ 8.15	8.05@ 8.25	7.85@ 8.15	8.05@ 8.25
Stove	Chicago	5.63	*7.75	*7.20@ 7.60	*7.75	*7.20@ 7.60	*7.75	*7.20@ 7.60
Chestnut	New York	2.61	7.85@ 8.00	7.90@ 8.10	7.90@ 8.10	7.90@ 8.10	**7.90@ 8.20**	7.90@ 8.10
Chestnut	Philadelphia	2.66	7.75@ 8.15	8.05@ 8.25	7.85@ 8.15	8.05@ 8.25	7.85@ 8.15	8.05@ 8.25
Chestnut	Chicago	5.63	*7.75	*7.20@ 7.60	*7.75	*7.20@ 7.60	*7.75	*7.20@ 7.60
Pea	New York	2.47	4.75@ 5.50	5.75@ 6.45	5.00@ 5.50	5.75@ 6.45	**5.00@ 5.75**	5.75@ 6.45
Pea	Philadelphia	2.38	4.75@ 5.00	6.15@ 6.25	5.50@ 6.00	6.15@ 6.25	5.50@ 6.00	6.15@ 6.25
Pea	Chicago	5.63	*6.00	*5.60@ 6.10	*6.10	*5.60@ 6.10	*6.10	*5.60@ 6.10
Buckwheat No. 1	New York	2.47	2.75@ 3.50	3.50	2.75@ 3.50	3.50	2.75@ 3.50	3.50
Buckwheat No. 1	Philadelphia	2.38	2.75@ 3.25	3.50	2.75@ 3.25	3.50	2.75@ 3.25	3.50
Rice	New York	2.47	2.00@ 2.60	2.50	2.00@ 2.50	2.50	2.00@ 2.50	2.50
Rice	Philadelphia	2.38	2.00@ 2.50	2.50	2.00@ 2.50	2.50	2.00@ 2.50	2.50
Barley	New York	2.47	1.50@ 1.75	1.50	1.50@ 1.85	1.50	1.50@ 1.85	1.50
Barley	Philadelphia	2.38	1.50@ 1.75	1.50	1.50@ 1.75	1.50	1.50@ 1.75	1.50
Birdseye	New York	2.47	1.65@ 1.75	2.00@ 2.50	....	2.00@ 2.50	....	2.00@ 2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type, declines in *italics*.



Coal Age Index 171, Week of April 3, 1922. Average spot price for same period, $2.06. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

some dealers to lay in a little additional tonnage. Producers loaded all available equipment, even though much of the coal was unsold, and storage piles were greatly reinforced during the last few days of the month.

COKE

Beehive coke production also increased during the week ended March 25. The output was 167,000 net tons, 18,000 in excess of the previous week. The improvement was due to Connellsville operators relighting many ovens, and while softening under the pressure of heavier offerings, the market absorbed the output with but little price recession.

February production of byproduct coke was 1,795,000 net tons and of beehive coke, 549,000 tons, as shown by the following table:

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Mar. 18, 1922 Inclusive	Week Ended Mar. 18
U. S. Total	45.6	54.8	60.3
Non-Union			
Alabama	63.5	62.3	74.0
Somerset County	55.5	75.4	79.0
Panhandle, W. Va.	55.3	49.4	55.9
Westmoreland	54.9	56.3	51.8
Virginia	54.8	58.3	61.3
Harlan	53.3	53.9	58.2
Hazard	51.7	60.8	52.1
Pocahontas	49.8	59.9	61.8
Tug River	48.1	63.5	71.6
Logan	47.6	60.5	59.5
Cumberland-Piedmont	46.6	50.3	56.8
Winding Gulf	45.7	63.4	70.3
Kenova-Thacker	38.2	53.5	56.1
N. E. Kentucky	32.9	45.9	52.6
New River‡	24.3	29.8	29.8
Union			
Oklahoma	63.9	60.7	66.0
Iowa	57.4	78.2	86.6
Ohio, north and central	52.6	45.3	49.3
Missouri	50.7	66.0	77.3
Illinois	44.8	53.4	58.6
Kansas	42.0	53.0	62.6
Indiana	41.4	52.7	57.4
Pittsburgh†	41.2	38.3	40.7
Central Pennsylvania	39.1	49.1	56.6
Fairmont	35.3	46.2	44.5
Western Kentucky	32.5	36.0	38.8
Pittsburgh*	30.4	29.8	36.1
Kanawha	26.0	13.5	9.6
Ohio, southern	22.9	24.4	22.7

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES (a)
(Net Tons)

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,638,000	3,733,000
1920 Monthly average	2,565,000	1,748,000	4,313,000
1921 Monthly average	1,660,000	463,000	2,123,000
December, 1921	1,860,000	514,000	2,374,000
January, 1922	1,903,000	496,000	2,399,000
February, 1922	1,795,000	549,000	2,344,000

(a) Excludes screenings and breeze.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE
(Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly average	2,625,000	4,354,000	6,979,000
1918 Monthly average	3,072,000	4,014,000	7,086,000
1919 Monthly average	2,988,000	2,478,000	5,466,000
1920 Monthly average	3,684,000	2,665,000	6,349,000
1921 Monthly average	a 2,385,000	a 731,000	3,116,000
December, 1921	a 2,672,000	a 811,000	3,483,000
January, 1922	a 2,735,000	a 782,000	3,517,000
February, 1922	a 2,579,000	a 866,000	3,445,000

(a) Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in byproduct ovens, and 63.4 per cent in beehive ovens.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

ITALY—The price of Cardiff steam first is quoted at 41s. 3d., according to a cable to *Coal Age*, a decrease of 6d., when compared with the price quoted last week.

GERMANY—Production in the Ruhr region during the week ended March 18 was 1,955,000 metric tons, according to a cable to *Coal Age*. The preceding week's output was 1,927,000 tons.

BELGIUM—The coal market, as a result of the lack of sales, which is more accentuated each day, is still in a critical condition. Stocks are burdensome.

HOLLAND—The latest quotation on the Rotterdam market for British coal per gross ton is 15.75 gulden or 27s. c.i.f.

INDIA—The tone of the coal market is very firm. Foreign coal is coming in and mills and railways are purchasing. Stocks amount to about 40,000 tons, including British coal. Prices are: Bengal 1st., Rs. 36; Bengal good 2nd., Rs. 32; British coal, Rs. 38; African coal, Rs. 33.

SWEDEN — Although a large number of steamers are arriving at Stockholm with cargoes of coal, prices, which lately have risen considerably, are not yet falling.

FRANCE — As a consequence of the large stocks of coal now accumulated at the pit-heads, the owners of the Escarpe Mines have informed their workers that it will be necessary to enforce twenty-four hours' idleness a week. As a result of the large stocks of coal at the pit-head, miners employed at the Bert Mines, near Moulins, have been dismissed. Sufficient men have been retained to work the pumps and the machines.

EGYPT—Of the 913,081 tons imported into the Suez Canal Zone for bunkering purposes during 1921, 45,061 tons were imported by the British naval authorities, leaving a balance of 868,020 tons for merchant vessels. The 1920 imports totaled 982,364 tons, of which 113,234 tons were taken by the British naval authorities. Of the total imported for merchant vessels, American coal amounted to 157,814 gross tons in 1921 and 89,346 tons in 1920. This increase is explained by the British coal strike in the spring of 1921.

British Coal Trade Not as Seriously Affected By Engineering Strike as Expected

COAL production in Great Britain was 4,957,000 gross tons during the week ended March 18, according to a cable to *Coal Age*. This is a slight decline from the preceding week's output of 4,996,000 tons. February exports were 4,014,334 tons and 5,014,000 as originially reported to *Coal Age* and published March 23, p. 511.

The American miners' strike is bringing Canadian inquiries but quotations are rather irregular. Chilean Railways are seeking tonnage for delivery in the next six months. Under the existing schedules of dock workers, however, the rate of exporting cannot be materially increased.

The export trade in South Wales has improved considerably. The majority of the collieries are booked up at the higher prices until Easter. In spite of these improvements the industry is by no means wealthy, and the owners are still carrying losses. In fact, the owners have since last November given up about £850,000 of their profits to insure the minimum wage to the men. In January the average proceeds were 20s. 1d. per ton and the costs of production 19s. 11d.

The dispute over the docking facilities still continues and a national conference will be called. The Miners' Federation is endeavoring to introduce a system for the regulation of prices, and this proposal has the support of some of the large colliery companies, and a collective appeal has been made to salesmen to confer with the object of eliminating unnecessary price-cutting.

Various Scandinavian owners have offered large boats for the transport of coal from Britain to the U. S. with coal on the basis of freights at 12s. 6d.@15s. per ton. On the other hand British observers do not anticipate a demand for British coal unless the American strike is protracted over two or three months.

The effects of the strike in the engineering trades, or the "lockout," the designation depending on the point of view, is not having such a serious effect on the coal trade as was at first expected. In the north of England no difference is noticeable, but this is probably because the industrial demand was pretty poor anyhow. In Northumberland and Durham the collieries are nearly all on full time.

Contracts from abroad include 12,000 tons of prime gas coal for the Christiania gasworks at 22s. 10½d. f.o.b., shipment to be made during April and May. The Bordeaux gasworks has contracted for 7,000 tons special Wear gas coal for shipment next month, and the Trondhjem gasworks for 1,500 tons of the same coal also during April.

Destination of British Coal Exports, February, 1920, 1921 and 1922

Country	Gross Tons 1920	1921	1922
Russia		......	17,546
Sweden	158,153	68,566	122,272
Norway	61,402	48,275	144,252
Denmark	91,042	167,392	165,598
Germany	......	48,909	359,889
Netherlands	32,269	106,268	336,725
Belgium	98,424	10,569	239,027
France	1,232,085	369,641	1,206,442
Portugal	24,652	30,808	47,842
Azores and Madeira	22,052	2,721	7,564
Spain	30,855	117,714	152,429
Canary Islands	28,484	2,252	27,011
Italy	310,445	310,934	319,349
Austria Hungary	5,002	......	......
Greece	18,075	26,028	16,061
Algeria	53,001	43,428	97,328
French West Africa	9,942	4,697	2,098
Portuguese West Africa	15,368	7,265	4,184
Chile	153	479	9,526
Brazil	19,271	8,838	72,318
Uruguay	34,358	4,958	35,378
Argentine Republic	49,058	73,591	128,252
Channel Islands	9,402	14,152	19,152
Gibraltar	106,875	26,138	50,364
Malta	25,633	13,764	5,891
Egypt	74,291	53,318	134,036
Anglo-Egyptian Sudan	......	160	......
Aden and Depend.	......	12,456	
British India		13,040	120,570
Ceylon	......	22,685	26,754
Other Countries	90,754	120,102	146,484
Total	2,601,046	1,729,148	4,014,433

British Coal Exports, February, 1920, 1921 and 1922

	Feb.	Jan.-Feb.
	Quantity (Gross Tons)	
1920	2,601,046	5,959,618
1921	1,729,148	3,429,254
1922	4,014,334	8,035,269
	Value	
1920	£9,693,712	£21,235,849
1921	4,240,620	9,796,328
1922	4,446,225	9,229,764

Much Pre-Strike Activity at Roads

Activity at Hampton Roads was unabated last week. Business was steadily increasing, with prospects of record-breaking activity if the coal strike is prolonged any great extent.

April 1 contracts were not in evidence, many buyers preferring to take chances with the current market rather than tie up for twelve months on present prices. Dealers in many cases, expressed the same tendency.

Prices remained practically unchanged, despite increased business attendant on the impending strike. Coal was available in unlimited quantities. Movements to New England consumed the bulk of the week's shipments. Much coal was being shipped north on consignment, anticipating the strike.

Hampton Roads Pier Situation

	Week Ended March 23	March 30
N. & W. Piers, Lamberts Point:		
Cars on hand	1,407	1,588
Tons on hand	73,257	84,822
Tons dumped	158,488	153,791
Tonnage waiting	8,000	14,150
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,733	1,624
Tons on hand	86,650	81,200
Tons dumped	125,631	108,862
Tonnage waiting	11,412	30,560
C. & O. Piers, Newport News:		
Cars on hand	1,218	1,494
Tons on hand	60,900	74,700
Tons dumped	83,042	57,065
Tonnage waiting	2,985	7,625

Export Clearances, Week Ended March 30, 1922

FROM HAMPTON ROADS:

For Atlantic Islands:	Tons
Nor. S.S. Thorgerd, for Barbados	2,979
Am. S.S. Callabasas, for Kingston	1,302
For Argentine:	
Ital. S.S. Stromboli	7,377
Br. S.S. Elswick Park, for Bahia Blanca	5,854
Br. S.S. Novington, for Parana	4,800
For Africa:	
Br. S.S. Knight of the Garter, for Port Said	1,297
For Canada:	
Nor S.S. Svartfond, for St. Johns, N. B.	3,042
For Chile:	
Am. S.S. Cacique, for Iquique	3,040
For Dutch Guiana:	
Am. S.S. Theoline	890
Nor. S.S. Solvang, for Port Tarafa	3,289

FROM PHILADELPHIA:

For Porto Rico:

S.S. Ozama, for San Juan............

Pier and Bunker Prices, Gross Tons

PIERS

	March 25	April 1†
Pool 9, New York	$5.35@$5.65	$5.35@$5.65
Pool 10, New York	5.10@5.35	5.10@5.35
Pool 9, Philadelphia	5.40@5.70	5.40@5.70
Pool 10, Philadelphia	5.00@5.35	5.00@5.35
Pool 71, Philadelphia	5.55@5.80	5.55@5.80
Pool 1, Hamp. Rds	4.50@4.65	**4.60@4.70**
Pools 5-6-7 Hamp. Rds	4.30	4.30
Pool 2, Hamp. Rds	4.55	*4.45@4.50*

BUNKERS

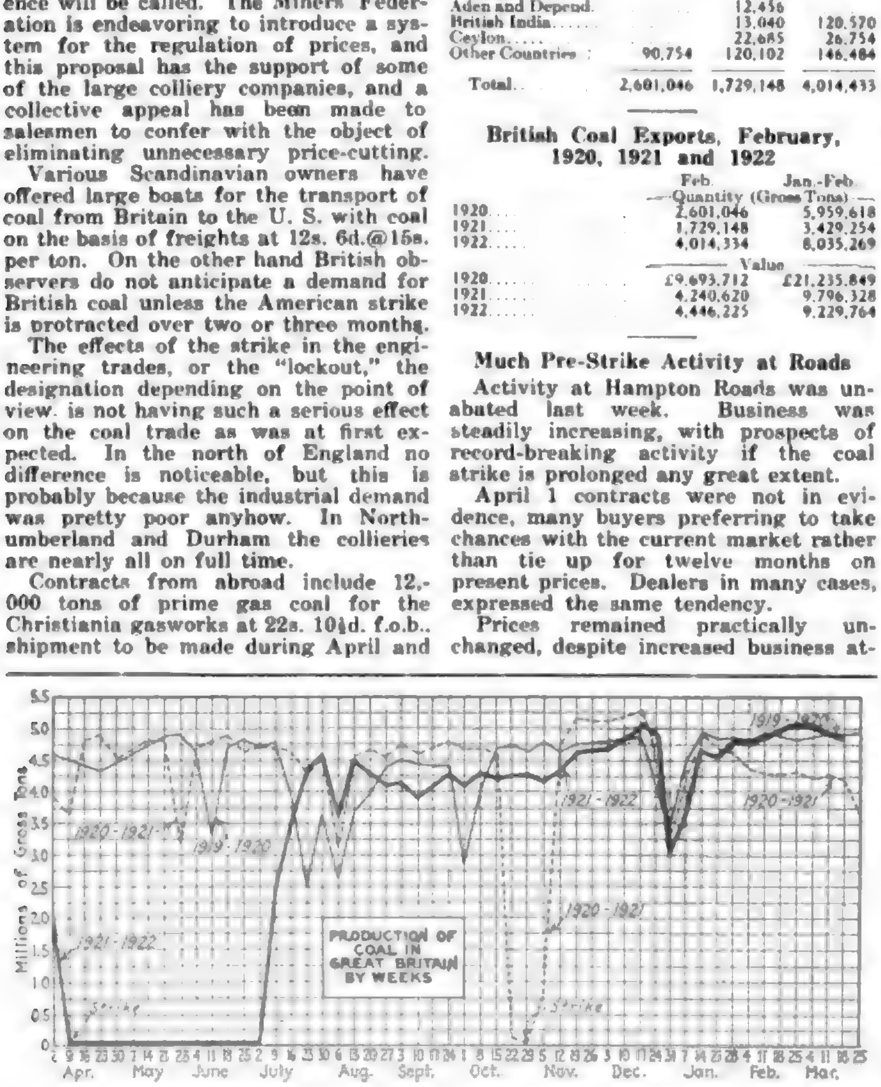
	March 25	April 1†
Pool 9, New York	$5.75@$6.10	$5.75@$6.10
Pool 10, New York	5.45@5.70	5.45@5.70
Pool 9, Philadelphia	5.60@5.85	5.60@5.85
Pool 10, Philadelphia	5.20@5.60	5.20@5.60
Pool 1, Hamp. Rds	4.80	**4.85**
Pool 2, Hamp. Rds	4.70	*4.60*
Welsh, Gibraltar	40s. 6d. f.o.b.	40s. 6d. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	42s. t.i.b.	42s. t.i.b.
Welsh, Messina	38s. t.i.b.	38s. t.i.b.
Welsh, Algiers	37s. f.o.b.	**38s. 6d. f.o.b.**
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	38s. f.a.s.	38s. f.a.s.
Welsh, Teneriffe	38s. f.a.s.	38s. f.a.s.
Welsh, Malta	42s. f.o.b.	42s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Belgian, Antwerp	30s.	30s.
Alexandria	47s.	*45s.*
Bombay	38 rupees	38 rupees
Capetown	39s.	39s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	March 25	April 1†
Admiralty, Large	27s.@27s. 6d.	27s.@27s. 6d.
Steam, Smalls	19s.@20s.	*19s.@19s. 6d.*
Newcastle:		
Best Steams	24s. 6d.	*23s.@23s. 6d.*
Best Gas	24s.@25s.	*24s.@24s. 6d.*
Best Bunkers	22s. 6d.@23s.	*22s.@22s. 6d.*

†Advances over previous week shown in **heavy type**; declines in *italics*



North Atlantic

Despite Imminence of Strike Market Is Notably Quiet

Prices Fail to Rally on Spot Business—Non-Union Quotations for Delivery After Middle of April Tend Upward—Buyers Await Rate Decision.

DESPITE the eve of the strike, market conditions last week were the quietest for some time. There was no last-minute stimulation and prices refused to rally on spot business. There was an upward tendency, however, to non-union quotations for delivery after the middle of April. Indications are that a slow market is ahead, as non-union tonnage is considered nearly adequate to meet needs at the current rate of consumption.

The expected announcement of the Interstate Commerce Commission on the recent application for freight reductions has a tendency to delay coal buyers. Whatever the decision, it should help the trade, as it will settle the existing uncertainty over the freight situation.

PHILADELPHIA

Last week has been one of the dullest experienced in a long while, being something of an anomalous condition with an impending strike. Prices remained at the low level reached the previous week, with very little buying of any kind.

As yet the full effect of the suspension has not been felt and operators are not in position to estimate just what tonnage they can get out from non-union mines. Of course strong efforts will be made by the union to cut down this force and there is just a possibility that this will cause an increase in spot prices. This is strengthened by the fact that there is an undeniable improvement in the iron trade. It is now the general expectation that the steel industry in this territory will be able to operate close to full for the balance of the year.

Reports are current that the Interstate Commerce Commission will soon render its report on the recent application for a freight reduction. Many consumers are holding off further purchases awaiting this decision. Whatever the ruling it should make for better buying, as the uncertainty of freight rates will then have been removed.

BALTIMORE

So quietly was the strike inaugurated that little public interest was shown outside of the reading of the large headlines in the newspapers. There was no general rush to get coal. Prices are possibly a shade better, but this is by no means marked.

Of course, should the strike reach heavily into the non-union fields the story would be different. For the present, however, the buying public is not hurrying for additional fuel.

The export situation dating from March 11 has shown a decided improvement. Despite the fact that not a single ship cleared from Baltimore for the first ten days of the month, March showed a total export loading on cargo account of 30,468 tons. The movement was the best for 1922, as the loading for January was 19,488 tons and for February 12,584 tons.

UPPER POTOMAC

In view of the spirit of antagonism shown by an element among the miners toward any reduction in the wage scale and their efforts to prevent others from working, several companies have suspended operations for the time being, producing only a little railroad fuel. This makes little difference since there is virtually no demand. Prices are declining on Pools 9, 10 and 11.

CENTRAL PENNSYLVANIA

During the first twenty-four days of March, the field produced 61,906 carloads of coal as against 58,949 cars in the corresponding period in February. Large consumers of fuel have heavy stocks on hand so that a shut-down for a time, at least, will not affect industry.

Consumers, generally, have thus far refused to take seriously the prospect of a prolonged idleness in the mining region. There has been little or no change in prices as a result of the strike situation.

FAIRMONT

There was no marked increase in production nor was there any better sale for coal as the month closed. On the contrary many companies had finished up filling their pre-strike orders and were shut down. Railroad fuel orders constituted the bulk of production but there was no increase in that class of business. Prices were slipping during the closing days of the month. On April 1 there were 1,226 cars under load awaiting shipping instructions.

NEW YORK

There was practically no increased buying which strengthened the belief that consumers had heavily stocked up early in the year. There were about 200 cars less at the local piers on March 31 than there were on the corresponding day of the previous week and most of this was on consignment. While quotations for spot delivery ranged about as the previous week, inquiries for shipments to be made in about two weeks were sometimes quoted from 25c. to 40c. higher than current figures.

The question of non-union coals coming forward in sufficient quantities to keep the market from sky-rocketing on account of the lack of coal was a topic generally discussed. It was feared, however, by some operators and shippers of these coals that the workers might join the strikers and then there might be a different situation to meet.

There is considerable Southern coal coming into this market and handlers of Pennsylvania coals say it is being sent into New England as far north as Vermont. Those coals coming here are on contract and it was said that some of the local public utilities have closed large contracts at low figures.

Coke

BUFFALO

The market has been strong, with no large amount offering. Domestic sizes have been wanted in good volume and some increase is reported in the call for chestnut coke, which until lately has been quiet. Prices are $4.50@$4.75 for Connellsville foundry, $3.25@$3.50 for furnace and $2.85 for chestnut coke.

CONNELLSVILLE

Coke has weakened a trifle since the last report. Nearly a week ago loaded coke without destination began to appear, and it has been possible to pick up odd lots of spot at $3.25, while for any regular supply $3.50 remains the market. Rumor has it that two merchant furnaces about to blow in have bought coke, the story putting it that the furnaces wish to conceal their identity.

Operators have been turning their attention more to coke in the past three or four weeks as the coal market turned dull and not a few additional ovens have been blown in, repeatedly creating a prospect that there would be a surplus of coke, but the output has all been absorbed fairly well at $3.25@$3.50. The market is as high as it was a month ago.

Foundry coke remains quotable at $4.25@$4.75 according to brand, but there is a better selection of brands at $4.25@$4.50 than a fortnight ago. Demand has fallen off a trifle.

The *Courier* reports production during the week ended March 25 at 85,400 tons by the furnace ovens and 49,010 tons by the merchant ovens, a total of 134,410 tons, an increase of 10,390 tons.

UNIONTOWN

While an appeal has been made to non-union miners to join the walkout there is no indication that miners are interested in the industrial debate. No direct effort has been made either to appeal to the Connellsville miners or to have them join the mine union. Organizers, however, are working in the adjoining Westmoreland field.

In the face of the shutdown the H. C. Frick Coke Co. is increasing output steadily. The coke market early last week showed signs of wavering but closed the week steady. The feeler by two furnaces for coke tonnage gave tone to the market.

The coal market is soft and no broker or jobber with his "ear close to the ground" expects to see any reaction from the strike for some weeks, at least until stock piles have been diminished. Quotations are $1.30@$1.40 for Sewickley; $1.40@$1.50 for Pittsburgh steam; byproduct, $1.60@$1.75.

Anthracite

Domestic Call Gains Slightly But Market Lacks Interest

Consumers' Indifference in Marked Contrast to Previous Strikes—Storage Piles of Steam Coals at Mines Adequate for Weeks — Plenitude Holds Down Independent Prices.

DEMAND for domestic coal increased slightly last week, due to the desire of some dealers to take in a few more cars before the strike sets in. The market was devoid of interest, however, and the consumers' indifference contrasted strongly with previous pre-strike periods. Steam coals were on an even keel, as storage piles at the mines assure an adequate supply for weeks to come.

Producers were very active during the last few days of March. All available cars were loaded, whether or not orders were in hand to cover. Companies have been running heavily to storage lately and there is considerable coal available to augment dealers' supplies when needed. The plenitude of coal held down independent prices.

PHILADELPHIA

A survey of the city retail yards indicates that there is a minimum of four to six weeks supply on hand. The public has been buying lately mostly for current consumption. During the latter part of the week cold, wet weather was in evidence and buying picked up quite briskly. In addition, there were a few buyers who were stampeded into the market at the last moment.

Despite some of the indications of a slight scare, the public as a whole looks upon the mine troubles in the light of a "bluff." All operators shipped their full production during the last week, but there was not the urgency on the part of the trade that was exhibited in the previous week.

One of the large companies continues to take orders for shipment during April, subject, of course, to the usual restrictions as to strikes, etc. It has been learned it has a storage stock of about 100,000 tons of sizes larger than pea. All of the big companies have heavy stocks of pea and expect to ship from storage all summer if the strike lasts that long.

Steam sizes continue without change. There are heavy storage stocks and it is not thought there will be any increase in prices for a month or more.

BUFFALO

Some of the larger companies stopped taking on new business late in March, being unable to promise early delivery. Dealers in some cases have been paying 25c. or 50c. premium last week, as they were much in need of additional stocks and were unable to obtain them from their regular sources of supply.

It was not due to any laxness on the part of shippers that some dealers and communities are out of coal. The advice was given out several weeks ago to buy for early needs, but the skeptical dealers, who felt sure that something would happen to avert a strike, were quite anxious to fill up their bins at the last moment.

ANTHRACITE FIELDS

The foreign element among the miners is well prepared financially to withstand the suspension, but the English-speaking miner is not so well off. The retail storekeepers had their lesson during the great strike of 1902 and the whole region will go on a cash basis. This will have a tendency to shorten the suspension.

The roads have many cars on the sidings, awaiting shipment to the market. One of the large coal companies has loaded every type of car it could get. A storage yard at Carbondale that has a capacity of 220,000 tons has 450,000 tons of chestnut and 100,000 tons of pea coal in it.

BOSTON

Thus far the number of family orders for next season's supply has been relatively small, and dealers are more or less mystified to know how they are coming out with their present stocks. Warm weather a week ago slowed the inquiry, but at this writing a heavy fall of snow is giving an impetus to spot sales.

The larger distributors will have on hand enough to cover deliveries equal to those for three months during 1921, but there is no telling what tonnage will be moved between now and July 1.

The companies have now ceased accepting orders, and while there are a few cargoes yet to be shipped from New York and Philadelphia, another week will probably see a complete cessation of loading at the piers, except possibly of egg and pea from storage piles.

NEW YORK

The indifference shown by the public to the approach of April 1 was the principal feature of the situation last week. Producers had no trouble to move supplies, having been booked ahead the past few weeks, but there was no excitement.

Independent operators and shippers who have refused to book orders exceeding their output for several days back cleaned up their coal on tracks so far as possible on Friday. There was plenty of company coal around, and regular customers had no difficulty in getting their shipments. Because of this and the apparent coolness of dealers to independent coals the demand was not as active as was expected and quotations showed little difference from the previous week.

Demand for the steam coals was quiet. Everybody seems to be well supplied and there was no unexpected rush to lay in reserve stocks. There are many loaded boats of rice and barley in the harbor.

BALTIMORE

There is probably five or six weeks' reserve coal here for those who are actual consumers during that period. Dealers are telling prospective purchasers that they would not advise laying in of the usual spring stocks of coal, taking the ground that prices are now probably at peak.

The dealers are inclined to believe that the strike will not last until midsummer and that they will be able to take care of the emergency calls the late part of the summer and the fall. No move has been made to ration the stocks on hand, but dealers are advising that consumers take only what they actually need.

South

BIRMINGHAM

Market conditions are quiet. Commercial buying has received practically no impetus attributable to the walkout, consumers buying in the same leisurely manner that has characterized the market for months past. The industrial demand has been slowly improving, due to more active operations at plants in Southern territory, but as yet there has been no heavy increase in coal consumption. Industry is not yet in that position where its requirements can be anticipated far in advance, hence the spot market affords an ample supply of fuel for current use, there being no inclination to stock a reserve.

There has been some change in steam quotations, prices ranging as follows:

	Mine Run	Washed
Carbon Hill	$2.00@$2.25	$2.00@$2.35
Cahaba	1.85@ 2.25	2.00@ 2.25
Black Creek ...	2.00@ 2.40	2.25@ 2.50
Pratt	1.75@ 2.00	1.90@ 2.25

Domestic demand is very weak and producers are finding trouble in disposing of output, and are diverting it toward filling steam orders when obtainable. April prices range as follows:

	Lump and Egg
Carbon Hill	$2.00
Cahaba	$2.75@ 3.00
Black Creek	2.75@ 3.00
Corona	2.00
Montevallo	3.50

A heavy output is accounted for principally by the demand for railroad fuel for stocking and the large amount being coked for furnace and commercial use. There is slight probability of any serious interruption to production in the Alabama field by labor disturbances.

VIRGINIA

During the latter part of March there was a loss of 7 per cent in the output, that telling in a measure the story of market conditions in the East. The aggregate output, however, was still above 60 per cent, or approximately 125,000 tons. Domestic grades were hard to move and the steam demand slackened, with prices also on a lower level. Producers anticipate a stronger demand before the close of April.

Chicago and Midwest

Consumers Ready for Strike; Prices Firm Up at Last

Eastern Coals in Heavy Volume and Midwest Producers Plug Sidings with Loads—Cold Spell Holds Domestic Prices—Operators Welcome Chance to Clean House.

CONSUMERS are "all set" for the strike and the suspension began with buying at a low ebb. A slight cold-weather flurry of buying by dealers last week held domestic prices firm while steam grades had an upward tendency. Eastern coals continued to flow in heavily and Midwest operators produced right up to the last day, loading all available equipment. Unsold tonnage is large.

Producers welcome a chance to clear their books of this tonnage; in fact, the mines could not have run much longer with conditions as they were. The domestic user maintains an air of aloofness and the industrial buyer now has comfortable stocks on hand. This has been the quietest pre-strike market on record.

The region finished the working period with considerable coal on hand, since every mine did its level best up to the day of the strike. Many an operator declares there will be little if any of this held for a rise in price. It is hard for them to imagine anything that would cause a rise until sometime late in the summer and that is too long to hold coal already on wheels.

There was a little demand all the while for screenings at a price that stood up close to $2.25 and Western producers, feeling that they must keep out all the Eastern coal they could, tried their noblest to fill the entire demand. It wasn't such a hard job. The railroad yards were full of coal most of the time looking for buyers so that even some first-class Pocahontas had hard sledding. A few large shipments had to be unloaded at sacrifice prices. One consignment of Pocahontas mine run went at $1 which was the low record of recent years in the Midwest.

Almost everybody was willing and ready for a strike. With conditions as they were before April 1, most mines could not have run much longer on the business in sight even if there had been no strike. The coal consuming public appeared to care not a whit whether there was a walk-out or not, and buyers who really needed coal had all they could use.

Beginning in May the trade hopes for a gradual pick-up though no one thinks any union coal will be in the country by that time. If there is no settlement between operators and miners in that month, a fight for markets probably will open up. So, as the strike starts and consumers begin to shovel into their reserve piles, the selling crews are setting their minds ahead for what may happen in midsummer.

CHICAGO

A slight flurry of dealer buying was the only last-minute feature of the coal market. A good many men who had insisted to salesmen that they were fixed for a strike if it should come, plead for "a few more cars" on the last day or two of coal digging. In a few cases they did not get them. But the market generally was full of coal of almost every size and a little shopping around brought to light about any kind desired and at a fair price.

Screenings were in fair demand and the price kept well above $2. In fact, it pushed $2.25 so hard during the end of last week that a good deal of business which might have been kept in Illinois was taken by Eastern coals.

Prices on Illinois domestic sizes were steady through it all. Southern Illinois prepared sizes ranged $3@$3.65, which was an almost imperceptible improvement. Standard district prepared sold $2.65@$3 and northern Illinois was quoted $4.25@$4.50. Indiana and Pocahontas slumped slightly, however. Very little Pocahontas sold for as much as $2.75 at the end of the week.

There were no new calls from manufacturers or public utilities and about all the business of the week was centered upon filling contracts and getting coal on hand down to a reasonable quantity. Country trade, which caused the slight flurry, was partly due to the snowy and rainy weather which swept over this country all week long, but many a sales manager ascribed it to a rush to cover by a good many small dealers who had actually believed there would be no strike.

WESTERN KENTUCKY

As a good many western Kentucky mines are not unionized, and one unionized section is under a no-strike contract with a year to run, it is believed that considerable tonnage will be produced. Some of the largest mines are operated on the open-shop basis, and the men are well satisfied. Production has been heavier as a result of a few rush orders.

Demand for screenings continues good, with supplies light. This condition is resulting in larger shipping of mine run. Many mines are running fuller than for months past, and are loading up sidings with production to move after April 1, if needed. Prices are weaker on lump, but screenings and mine run are stiffer.

ST. LOUIS

The quietest pre-strike period that St. Louis has ever experienced is that of the present. There is no domestic buying excepting in small quantities of cheap coal for temporary purposes. The domestic situation in the country is just about the same. Nobody is worrying. Providence seems to be on the side of the man with little money.

Some steam plants figure rather than spend money on storage of coal it will be more economical to suspend operations until coal gets cheaper. The past two months have been record breakers in the sales of smithing coal in St. Louis, which is recorded as being the heaviest smithing coal market in the country.

Retail prices are:

Carterville	$7.50@$8.00
Mt. Olive	6.50
Standard	5.75
Anth. stove	15.75
Anth. egg and grate	15.50
Anth. nut	16.00
Anth. pea	14.25
Smokeless	12.25
Byproduct coke	10.50
Gashouse coke	9.75

INDIANAPOLIS

Demand for steam coal continued strong in the final week preceding the strike. There was no lack of active supply and as a result there were no noticeable price changes recorded. Just what will happen after about a month of strike, is problematical.

Retailers are offering coal for lower prices than have prevailed for three years. Practically every retailer in Indianapolis has a stock on hand which is only limited by the capacity of his yard. Industrials have coal supplies to last from 60 to 90 days and some have sufficient reserves to hold out 120 days.

SOUTHERN ILLINOIS

There is no excitement, no speculation as to what coal is worth or will bring and there is the idleness that always prevailed previous to a strike in other years, at that time because of no equipment and now because of no business. Dissatisfaction is rampant among the miners. Over the field is an air of poverty. Nearly all the Carterville miners are in favor of a strike; a fight to the finish against a reduction.

Railroad tonnage has been good. The only commercial demand has been for screenings and some operations have been giving their lump coal away below cost to get screenings.

The Standard field is quiet. There is no demand for anything except a little screenings. Mines working on railroad tonnage have run full time.

It is estimated that on March 31 the unbilled tonnage aggregated between 2,500 and 3,000 cars, so that there will be no shortage of coal for some time to come in the St. Louis territory.

A forerunner of the things that are to be is noticeable in the tonnages produced by big companies who have perhaps exceeded all of their previous records during the past month, while hundreds of smaller mines are idle unable to compete in salesmanship, marketing problems and economical management.

LOUISVILLE

Jobbers are assuring their customers of their ability to supply fuel, if not from one group of mines then from another. Producers are anticipating that many non-union mines may go out at the start in sympathy, but that after a few days of idleness they will be glad to get back to work. A considerable tonnage is on cars at mines, waiting for orders. Much of this coal is lump, produced in an effort to supply screenings, and with the belief that it would sell in event of strike.

The coal trade takes the attitude that there could be no better time than now for a strike. "Let the miners get it out of their system," is the general feeling.

Northwest

Strike Worries Nobody Around Head of Lakes

Dock Stocks Look Good for at Least Three Months, Possibly Five—Eastern Coal May Come by Boat—Utilities Reassure Customers.

THE Northwest region has settled itself for the strike period. The docks are piled reasonably high with both soft coal for industry and anthracite for domestic use, so that not only the half-informed general public, but also the reasonably well-informed large coal buyers believe the region is good for at least three months and probably five. Some of the gas and electric-light and power companies are publicly assuring their industrial customers that service will be uninterrupted.

Dock men are eyeing their stocks with almost a paternal interest, however, and are not going after any new business. Plans are now being made, rather indefinitely, for distribution of dock stocks through the Dock Operators' Association of Minneapolis.

MINNEAPOLIS

The strike seems to have caused little worry in the Northwest. There has been some little preparation for trouble, however, as evidenced in the fact that coal shipments during March have gained considerably over a year ago.

It is quite possible that the strike may cause prices of coal in store to be worth more, but it will hardly result immediately. And since the docks are amply supplied, there is no reason for haste in laying in more than a moderate amount for early needs.

The Northwest is in the best condition of any portion of the coal-buying territory. There is in store on the docks from 60 to 90 days' supply, which period is assumed will be the fullest extent of the suspension.

Altogether, the Northwest feels little cause for apprehension now. Some public utility corporations have providently laid in an extra store. Some of the railroads have distributed fuel along their lines, in order to be on the safe side. But both moves seem to have been not quite necessary, though tending to assure against a stringency when stress sets in, if it does.

One lesson which has been learned, from past experience, is to guard against prophecy on the matter of the strike. For some years past, the trade has had the misfortune to predict shortages and scarcities of fuel, none of which developed. And coal buyers saw in the move nothing but an effort to urge people into buying coal through the threat of a shortage. So the present situation has been let severely alone.

The tonnage of coal handled in the Twin Cities by one of the leading roads during the first three weeks of March was more than double the same period of 1921, with 7,600 cars this year and 3,400 last year.

DULUTH

Despite the strike, coal buying at the Head-of-the-Lakes is absolutely at a standstill. Dock men claim this is fortunate for otherwise dock stocks would disappear too soon. Docks are not refusing orders. They simply are not looking for business, and are trying to conserve supplies. The coal situation is sized up by an authority, as not dangerous, but ticklish.

It is estimated that 3,000,000 tons of bituminous coal and 500,000 tons of anthracite will be on the docks when navigation opens about April 20. This should carry the trade for three months and if a little Eastern coal trickles in the Northwest should not feel the pinch of want for about four or five months.

Dock men are already talking of a regulation of shipments, and the possibility is that the Dock Operators' Association of Minneapolis will take charge of distribution. If this happens the industries and public utilities will be supplied first. Dock men hope that there will be no Government control of distribution as during the last strike.

Prices are firm all around with no showing of a change either way. Retail trade in Duluth and Superior, is reported as good, though the weather is milder.

MILWAUKEE

The coal market at Milwaukee is flat, and there is hardly any more animation at the docks than in summer. There is a dribbling movement outward by rail, and deliveries in the city are generally confined to small lots. Soft coal screenings are in some demand and little on hand. Screenings will probably continue scarce until navigation opens. Coke is being delivered a little more liberally of late. Prices of coal and coke have not undergone any change.

The Wisconsin Gas, and Wisconsin Electric Association, have issued a joint circular saying they have 60 to 90 days' supply on hand, and that factories and other industries using electric light, power or gas may count on uninterrupted service.

New England

Surfeit of Coal Makes Distress Prices Common

Market Less Active Than at Any Time Since Year Began—Textile Strike Spreads and Many Stock Piles Remain Stationary—No Railroad Fuel Orders in Sight.

APRIL 1 finds the coal market less active than at any time since the first of the year. The textile strike is spreading and many reserves are almost stationary. For Pennsylvania grades there is a most restricted territory and even at Hampton Roads there is only a moderate request. The market is so surfeited with coal that distress prices are now a common occurrence. The union mine suspension will be a check to the flow of coal which has been coming under forced draft to this territory.

The Maine Central has joined other New England roads in closing contracts. With these railroad orders disposed of there are in prospect no further requisitions of any size for engine fuel for several months to come.

Buyers are not at all impressed by strike talk. The market is less active than at any time since Jan. 1, and no recovery is in sight. The textile strike is spreading rather than otherwise and for a large number of plants coal reserves remain almost stationary and inquiry is of the most scattering character.

Receipts all-rail have been fair, but a large proportion of these were shipments on contracts that have now expired. The trade here is interested only mildly in efforts in the central Pennsylvania regions to make a vigorous contest with the mine-workers' unions, for neither by water nor rail is there expected much volume this year from districts that during the war period supplied a heavy tonnage.

For Hampton Roads coals there is only moderate request. A fair tonnage is coming forward, but most of this is either on contract or on old purchases. There has been inquiry here for Pool 3 slack for one of the large utilities, but there is enough competition for the order to drive prices down to levels that many operators will not consider. When offered for distribution Inland, Pocahontas and New River mine run meet with hard going; $6 flat, on cars Boston and Providence, has been quoted by factors with coal on their hands to force on the market.

The Maine Central has joined other New England roads in closing contracts for locomotive fuel. The Consolidation Coal Co. is rumored to have secured a fair amount of this tonnage, the remainder being placed with Boston factors, but the prices are not yet out.

At Philadelphia and New York piers there is hardly a wheel turning on bituminous, aside from certain contracts.

Eastern Inland

March Closes with Year's Biggest Output; Prices Sag

Railroads Continue Storing in Bad-Order Cars—Many Operations With Orders Filled Close Before April 1—Steel Trade Holds Encouragement.

MARCH closed with the highest production of the year. Railroads had generally filled their needs but continued to store coal in bad-order cars, while some last-minute stocking also was noted as the strike became a reality. The demand was not sufficient, however, to absorb all the coal offered, and prices continued to soften. Many operations were closed before April 1 where producers had cleaned up all their orders.

Apparently, it will be many weeks before consumer interest revives, because of the heavy stocks on hand and the slow rate of industrial consumption. The steel trade is showing encouraging activity, however, and production now is equal to the pre-war capacity rate. This improvement is sure to react on the coal trade.

CLEVELAND

No reaction to the strike situation has yet developed. Public utility companies and railroads were taking coal up to the day of the walkout, but industrial users were apathetic.

The steel mills are fairly well stocked, having about 48 days' supply. The remarkable expansion in steel activities, however, may be a factor making for greater consumption of fuel than had been anticipated. In Cleveland and in Youngstown the iron and steel industry is operating at over 70 per cent of capacity. This is at a rate that would have been full capacity before the war.

Lake vessels are being lined up. This indicates the feeling of shippers that the strike will not cut off the movement of Lake coal this spring. Tonnage for moving about 70,000 tons to Buffalo has been chartered, as protection against a coal shortage if the strike is protracted.

The greater portion of the coal arriving at Ohio Lake ports has been from the Pittsburgh district. For the season to the beginning of April the Lake boats took about 4,000 cars compared with dumpings of 6,046 cars for the corresponding period of one year ago.

Successive decreases during the past few weeks in the volume of bituminous coal arriving at Cleveland tends to corroborate the claim that users will enter the period of mining suspension with a good supply of fuel on hand. Receipts during week ended March 25 were only 1,302 cars, industry receiving 1,014 and retail yards 288. Total decreases under the preceding week amounted to 266 cars. This volume is at least 40 per cent under that of several weeks ago.

EASTERN OHIO

Operations were speeded up during the week ended March 25 to meet a general pre-strike demand for storage fuel. Production recorded a new high point for the year—453,000 tons or 73 per cent of capacity—and exceeded that of the previous week by 55,000 tons. Eastern Ohio is now approximately half a million tons ahead of the same period in 1921.

Reserve fuel programs of the various railroads were substantially completed some 10 days ago except that they have continued to load surplus "bad order" equipment, thus converting it into side-track storage facilities and enabling them to carry a maximum of fuel for the cessation period. However, the major portion of increased production went to industry.

With the large quantities of storage fuel on hand, no apprehension is being shown by consumers. There is also considerable expectation that stocks can be amplified if necessary from non-union mines, many of which maintain selling agents or connections in this market. Contrary to the usual course of spot prices when operations are augmented by reason of greater demand, a softening tendency prevailed during the week and most grades were selling off as compared with spot prices prevailing a week before.

The peak of production passed with the week of March 25 as many mines had already taken care of their trade in anticipation of the exigency and closed down several days prior to the end of the month.

PITTSBURGH

The coal market in general continued softening up to the last day before the strike date, not on account of available supplies increasing but on account of demand decreasing farther. Various mines on the fringe of the region here and there have been understood to be operating at rates below the union scale but continuance of operation at such mines is not counted upon for a certainty by any means.

As to the competing coals of the Connellsville region, Sewickley vein steam coal has continued to be offered at \$1.25@\$1.30 and perhaps in some instances less has been done, while Pittsburgh steam has been readily available from some sellers at \$1.50, with one sale reported at \$1.40. One large Connellsville interest has closed two mines in the past three weeks on account of lack of orders.

No important developments in the strike situation are expected for several weeks, the union mines simply remaining closed. Some strikes, technically "sympathetic" are expected in non-union regions.

The last regularly quotable market on Pittsburgh district coal was about as follows: Steam slack, \$1.30@\$1.50; gas slack, \$1.50@\$1.60; steam mine run, \$1.80@\$1.90; high grade gas, ¾-in., \$2.60@\$2.70; Panhandle 1¼-in. domestic lump, \$2.75.

BUFFALO

Consumers are hard to interest, even in single-car orders. Some rumors of possible strikes at non-union mines are heard, but it is not believed that such an outcome is likely on any considerable scale. The outlook is not bright, but some shippers and dealers expect April business to show a slight gain over March.

It will apparently take many weeks before consumers will begin to show much renewed interest in coal. They are carrying from one to four months' stock already, and as they are using but little coal they see no adequate reason for buying more.

Slack, which was selling in better volume than other coal recently, is now little wanted, even at low prices. Quotations are about \$2 for Youghiogheny gas lump, \$2.35 for Pittsburgh and No. 8 steam lump, \$2.10 for Allegheny Valley and other mine run and \$1.60@\$1.80 for slack.

NORTHERN PANHANDLE

The strike approach has not served to appreciably enhance the demand. There has been a little more railroad buying. Uncertainty prevails as to contracts, especially among companies operating union mines. Where mines are operated on a non-union basis, however, there is more activity.

COLUMBUS

Additional steam orders were received during the last week in March, but this had only a slight effect on market conditions as a whole. Buying on the part of railroads and public utilities was the best feature. Some buying on the part of general manufacturers was reported but this was not important. In fact, some distress coal sold at rather low levels.

Lump has been somewhat quiet. Screenings have been the strongest point in the market. This is due to a reduction in the production of lump and not so much to increased demand for the small sizes.

Production still ranged around 25@28 per cent. Some mines were closed before the end of the last week in March where producers had cleaned up their orders.

DETROIT

There is seemingly no increase in demand, due to the suspension of work by the miners. Most of the large steam consumers and all the public utilities in Detroit appear to have a comfortable supply in excess of current needs. The railroads are well supplied and most of the retail dealers have considerable quantities on hand.

The proximity of weather that will permit doing without heating service, is a factor in discouraging buying by householders except in instances where their supply has become exhausted.

Four-inch West Virginia lump is quoted \$2.50, 2-in. lump, \$2.25; egg, \$2, mine run, \$1.50, nut and slack, \$1.30. Three-inch Ohio lump is \$2.75, 1¼-in. lump, \$2.50, egg, \$2.25, mine run, \$1.85, slack, \$1.50. Smokeless lump and egg is \$3.25, mine run, \$2, slack, \$1.50.

Cincinnati Gateway

Interest Veers from Strike To Freight Rate Changes

Spot Quotations Lack Strength But Market Has Steadied Somewhat—Loads at Portsmouth Normal—Retail Price Cutting Ceases—Lake Inquiries Slowest in Twenty Years.

IMPENDING changes in freight rates have actually overtopped interest in the strike. At any rate, no concern is shown over the possibility of a short supply, while on every hand the trade is awaiting some announcement of a readjustment of carriers' charges.

There is no strength to spot quotations, although the market has steadied from its precarious position of ten days ago. The accumulation of loads at Portsmouth has been reduced to normal.

Some tardy Lake business is appearing but buyers are not interested in anything but wide-open contracts, giving them the assurance of tonnage as they may need it. Not for twenty years have Lake inquiries been so delayed.

CINCINNATI

Some Lake business is beginning to show itself. Wide-open contracts are being suggested from the buyer's side, which means that only an assurance of coal is desired. The oddity of the market is that March slipped into April without a price being made for deliveries of coal for that month. This is a thing unheard of in this market in the past twenty years.

Smokeless business steadied itself after a slight decline and while $3 was asked for the better grades, that was top and not the rule. The bulk of the sales were made on the low figure for egg and lump. There was little demand for nut and mine run had a better tone to it. Slack held to the slight gain in favor shown the week before.

Inquiries and sales at Tidewater from the Logan County fields were the feature of the bituminous market. This was at a $1.50 mine run basis. Slack and mine run were quoted on a parity by both the West Virginia and the southeastern Kentucky mines. Gas producers were the heaviest takers of the spot coal that was bought.

Retail business showed great improvement. Householders and others were putting away coal and the brakes were placed upon price cutting by the threat of one of the older companies to sell for freight plus the cost of coal. The prices for April delivery are: Smokeless lump, $7.25@$7.75; mine run, $6.25@$6.75; bituminous lump, $6.50@$6.75; mine run, $5.50, and slack, $4.50.

HIGH-VOLATILE FIELDS

Kanawha

Production continued to dwindle as March drew to a close. A few plants are being operated on an open-shop basis and therefore are in a position to continue mining. A poor demand and low prices make it impossible for the general run of owners to secure orders. The biggest drop in price has been on lump or block which is now selling below $2. Slack is somewhat scarce and little is to be had.

Logan and Thacker

Largely because of contracts, Logan mines are working almost to capacity, production still averaging more than 50,000 tons a day. Spot orders are at extremely low prices, especially for prepared grades and mine run. Mines in this field will continue to operate and it is because of that fact that so much business has been attained.

Toward the end of March the output in the Williamson field declined to some extent. Curtailment of operations was not sufficient to force any mines to shut down, however. Production is affected to the extent of about 3 per cent by a shortage of cars. Prices are somewhat weaker due to the slackening demand.

Northeastern Kentucky

In common with other fields, the region experienced a drop in the demand. Production during the first two months of the year was just double that of the corresponding period of 1921. Companies are preparing for increased production during the strike and during the summer in general.

SOUTHEASTERN KENTUCKY

Demand for all grades has been on the decline until just before the strike, when it showed a good deal of recovery. All grades except block moved freely and prices were higher.

It is not known whether the operators who recently signed the Knoxville agreement for two more years work under the 1917 scale will be allowed to work or not, but the opinion is that they will not and that practically 100 per cent of the mines in Bell and Harlan counties will be down.

LOW-VOLATILE FIELDS

New River and the Gulf

Despite a general slackening of demand and the downward trend of prices, New River mines were keeping up production during the latter part of March. There is so much coal in the market, however, that not all the tonnage produced is being readily absorbed, as a result of which coal has accumulated on sidings to some extent.

Shipments from the Gulf region to Tidewater were affected by a further extension of the strike among textile workers in New England. Manufacturing plants and public utilities are well provided with coal in storage. Although tonnage has steadily increased on the line of the Virginian, producers found no demand to amount to anything and do not anticipate much business for several weeks to come. Prices still show a downward trend.

Pocahontas and Tug River

During the latter part of the month there was a lessened demand for Pocahontas. In consequence there was a drop in production. With so much smokeless fuel on the market prices have declined. There was a little better movement to Tidewater and smokeless is by no means plentiful at the seaboard.

Tug River production was lower during the closing days of March than it had been for a month or more, dropping from 110,000 tons down to 87,700 as the market became surfeited. Prices have been an influence, all grades being on a lower level. Even with production somewhat curtailed, virtually all mines are in operation.

West

KANSAS CITY

Operators and consumers appear to have been quietly putting their affairs in shape for a healthy strike. The Kansas Industrial Court has announced that if the strike causes undue public inconvenience the operators must continue to pay the old scale until a settlement is made, with the Industrial court acting as intermediary. However, there is now a surplus at the mines sufficient to supply the trade for a week or ten days. Steam plants have stored enough for 60 to 90 days. It seems doubtful whether the public could suffer much inconvenience in the face of such stocks.

There are enough "no bills" at the mines right now to care for any reasonable demand so that mines could hardly operate now even if there were no strike on.

Prices, being at rock bottom, show no material change from last week.

SALT LAKE CITY

Retailers report a considerable falling off in the demand as a result of the spring-like weather. Perhaps the threatened strike has had the effect of making the demand a little more brisk than it would otherwise have been.

There is not much coal in the yards and if a general strike does not come there may be much suffering unless the weather keeps warm. Most of the big users are well stocked and there is not likely to be any interruption of industrial operations in any event.

DENVER

Acting Governor Colley petitioned officials of District 15, United Mine Workers, not to sanction any nationwide movement for a strike, declaring that it "would add materially to the general unemployment and would fail because of the desperate financial condition of the men."

Wholesalers and operators have made little preparation for a strike of any duration, and consumers are little concerned about the possibility of a shortage of coal, which, in Colorado, would be in the lignite field if it came at all.

Prices show no fluctuations, and this is another indication of the public pulse.

News
From the Coal Fields

CONNECTICUT

The Beach Lumber Co., Bristol, recently filed papers of incorporation, to engage in the lumber and coal business. The capital stock is listed at $60,000. Officers are: President and treasurer, Duane W. Beach; secretary, I. H. Johnson.

The Tuxis Coal Co., Meriden, is planning to commence work shortly on the construction of a reinforced-concrete and steel coal pocket, with a capacity of 2,000 tons. The pocket will have the latest coal handling equipment.

ILLINOIS

The shipping department of the **O'Gara Coal Co.**, has been located temporarily in the Big Four freight offices at Harrisburg. The main offices at Harrisburg were recently destroyed by fire.

A. P. Blackstead, formerly chief engineer of the Camden Iron Works (R. D. Wood Co.), Camden, N. J., and prior to that hydraulic engineer with the Henry R. Worthington Co., New York, has joined the engineering staff of the Dayton Dowd Co., Quincy, manufacturers of centrifugal pumps.

Eugene McAuliffe, of St. Louis, called on a number of his Chicago friends late in March.

Fifty-eight years in coal mines is some record, but that is the one claimed by **M. Prosser**, who works in one of the Mt. Olive mines. He came to Illinois in 1862 and has worked continually in the mines in this state for over 58 years, being everything from a miner to a mine manager and always an official in some capacity in the local union.

William J. Spencer, president of the Monmouth Coal Co. of Monmouth, was in Chicago late in March.

George, Albert and Frank Reisch, of Springfield, recently purchased the mine of the **Spring Creek Coal Co.**, near Springfield. The mine has maintained a good working average for the last two months and employs about 400 men.

More than 100 tons of coal burned with the coal chute of the Chicago, Milwaukee & St. Paul R.R. at Dixon a short while ago.

C. E. McLaughlin, recording secretary of the Illinois Coal Operators' Association, made a recent business trip to Chicago.

J. E. Hoey, well-known mining man of southern Illinois and a resident of Sesser, has just been appointed state mine inspector of Franklin County. He succeeds **John O'Rourke**, who resigned recently.

INDIANA

Hugh Jenks, president of the Producers Coal Co., who has been a victim of the "flu," has been taking the waters at French Lick. **Dan Pritchard**, Western manager of his father's company, the Virginia Fuel Co., also was at the springs.

Judge A. B. Anderson in the Federal Court at Indianapolis has released on their own recognizance twelve Indiana coal operators who are defendants in the case brought a year ago by the Government against 225 operators and miners on a charge of conspiracy to violate the Sherman anti-trust law. Those released from bond are the ones who had given surety bonds in the sum of $10,000. The action was said to have been taken merely to relieve the defendants from paying premiums on their bonds.

The Wallace Mining Co., at Huntingburg, filed papers with the secretary of state recently showing an increase in the number of its directors from three to seven.

KENTUCKY

A bill enacted recently by the Kentucky Legislature, and supposed to have been included in a final batch sent to the Governor for signing, is missing. This bill would have forced all coal operators and employers, who issue script, checks, etc., to employees, to redeem such "currency" for whoever held it, regardless of whether they were employees. In some mines it is contended that payment for labor is made in script, and that the commissary will not cash it for any other merchant, which enables such a commissary to control all of the business of its employees.

Trainmen, including engineers and others, of Boone County, W. Va., have just completed the organization of **The Coal River Collieries Co.**, with $2,000,000 capital, after purchasing the mining plant of **The Eureka-Elkhorn Coal Co.**, on Beaver Creek, and will start development of these properties at once. The company also acquired several thousand acres in Boone County, and will start development of these this year. Shipments will be made over the C. & O. from Beaver Creek. The main office will be in Cleveland.

The Louisville office of the **Consolidation Coal Co.**, of Chicago and St. Louis, has been closed and George E. Davis, who has been in charge, will be located at Roanoke, Va.

NEW YORK

For the year ended Dec. 31 last the **Clinchfield Coal Corporation** reports net earnings before fixed charges amounted to $120,923, leaving a net income after fixed charges of $877,725. Of this $43,544 was paid into a sinking fund to retire preferred stock, $94,252 was paid as preferred dividends. A total of $327,321 was paid on the common in the form of dividends and $139,681 set aside as a reserve for 1921 federal taxes, leaving a surplus for the year of $272,925.

The Orton & Steinbrenner Co., of Chicago and Huntington, had made arrangements with **J. Ross Bates** to represent them in the New England States and New York City. Mr. Bates has offices at 136 Liberty St., New York City and 128 School St., Watertown, Mass.

Howard W. Showalter, of the Diamond Coal Co., of Fairmont was in New York recently.

Sandvik Steel Inc., announces the consolidation of the general steel and steel belt conveyor departments, 233 Broadway, New York City; W. D. Thomas, president and general manager, Anders Johnson, vice-president, Garrick M. Spencer, secretary and Harry Carlson, sales manager.

Everett Drennen, of the West Virginia Coal & Coke Co., was a visitor in New York and other Eastern markets a short time ago.

A coal men's bowling tournament, with five teams contesting, has been concluded at Buffalo, after playing forty-six games. The team of Charles A. Switzgable won with thirty-one games. Numerous prizes are to be distributed.

W. L. Simpson, who has been in the coal trade for a number of years, and who has recently been the representative of Currie & Campbell, Philadelphia, has started the **Simpson Mining Co.**, with office at Rochester.

OHIO

W. R. Grant, of the Harlan Coal Co., High Splint, Ky., **J. B. White**, of the Cleveland Cliff Iron Co., **Roy Cunningham**, of the Twin States Fuel Co., Huntington, and **A. B. Rawn**, of the Solvay Collieries Co., were recent visitors to the Cincinati market.

John Bricker has been appointed receiver for the **Lakin-McDowell Coal Co.**, a wholesale concern which had its office in Columbus. The application was made by the **W. J. Hamilton Coal & Coke Co.**

The Crawford-Long Coal Co., Toronto, has been chartered with a capital of $100,000 to mine coal in the eastern Ohio field. Incorporators are O. Y. Crawford and W. M. Long.

Nearly two weeks after the fatal accident to the "Helper," harbor boat of the **Campbell Creek Coal Co.** in Cincinnati, it was located in the region of Fernbank dam. The body of Captain Burnside, manager of transportation for the company, had not been recovered and divers were being sent down in the hope of locating it.

Part of the contracts let by the Louisville & Nashville for its fuel supply went to **Burlingham Coal Co., the Blue Diamond Coal Sales Co., and the Southern Coal & Coke Co.** It was understood in Cincinnati that most of the bids went in around $2 but the awards were made on a $1.65@$1.75 range. The requirements called for a 6-in. mine run.

Sam Stephenson, who comes from a family long identified with coal, cement and furnace interests in the Jackson district, while in Cincinnati said that the cement business was beginning to boom and that from a coal man's viewpoint business from that angle should be brisk.

PENNSYLVANIA

Pittsburgh Coal Co. earnings for 1921 show net income after all charges, but before Federal tax, of $3,673,543, equal to $4.89 a share on $32,169,200 common after preferred dividends.

The Erie Steam Shovel Co. is the new name of the **Ball Engine Co.** The engine business having been sold, the entire manufacturing facilities are now being used for building steam shovels and cranes. There has been no change in management, personnel, etc.—the change is in name only, to provide a corporate title more in keeping with present activities.

C. C. Beury, of Charleston, president of the Beachwood Coal & Coke Co., of the Turkey Knob Coal Co., and other smokeless fuel concerns, is a patient at the Jefferson Hospital at Philadelphia where it will be necessary for him to remain for several weeks. Mr. Beury has been in very poor health recently.

The Workmen's Compensation Board has dismissed the appeal of Millie Zelazny, Chambersville, against the **Seneca Coal Mining Co.**, Chambersville. The opinion holds that there is no positive evidence that the husband of the claimant met with an accident as contemplated by the workmen's compensation act, nor that death followed as a result of the injuries sustained as evidenced by the wounds found on the decedent's body but that the circumstances, together with the medical testimony, are convincing that the decedent did meet with such an accident and that his death resulted from the injuries received.

The Gilmore Coal Mining Co., Allegheny County, has notified the State Department at Harrisburg that it has increased its indebtedness from nothing to $300,000. S. A. Gilmore is president.

Following the firing of two shots, in No. 4 breast, of No. 3 level, at the No. 11 colliery, of the **Lehigh Coal & Navigation Co.**, near Coaldale, Pa., two miners were instantly killed, and two others seriously, if not fatally, burned. The men who lost their lives and those who were injured were working in a breast, adjoining the one in which the blasts were fired. The accident occurred at an operation, located near Seek, between Tamaqua and Coaldale, and nearer the former place. In the gas explosion the other two men were injured.

J. C. Middour, a former state forester and service man, recently employed by the Richards Estate at Pottsville, has accepted a position with the P. & R. Coal & Iron Co., as an assistant forester with headquarters at Tremont. He will have charge of protection and forest utilization work in the vicinity of Tremont, and will conduct planting operations, make timber estimates and surveys, open trails and fire lanes as may be authorized.

During the first three months of 1922, members of the Workmen's Compensation Board wrote 176 opinions and decisions. During January, 70 opinions were filed at Harrisburg, in February, 65 were filed and in March, 41.

The State Supreme Court will hear argument in the **anthracite coal tax and the Fowler and the Kohler mine cave laws** in Philadelphia, April 17, according to notice furnished the Attorney General's Department at Harrisburg. The constitutionality of the coal tax law was attacked in the Dauphin County Court while the mine cave cases originated in Lackawanna County. The coal tax appeal will be argued for the State by Attorney General George E. Alter.

The breaker of the National colliery of the **Glen Alden Coal Co.**, in Scranton, is for sale "as is," the purchaser to dismantle and remove. The breaker has been idle since the cave at the National mine, Jan. 13. The attitude of the city officials is such that it seems unlikely the mine will resume work for some time, so it was decided to remove the breaker. When and if the mine itself goes into operation, the coal will be run through the Taylor breaker.

F. E. Zerbey, general manager of the **Kingston Coal Co.**, on behalf of that corporation, has decided to donate a double house in Courtdale to the Community Association, organized for that purpose, so that the citizens may have a community center. The property includes considerable ground, and the committee in charge is already arranging for a tennis court, several other play courts, and a swimming or wading pool big enough to accommodate all the youngsters who may care to come.

Appeals taken by the **Peoples Coal Co.**, of Scranton; **Frank P. Christian**, its president; **John G. Hayes**, general manager, and **James Pearn**, colliery engineer, joint defendants in a suit brought by the City of Scranton, involving surface support to a large area in West Scranton, have been dismissed by the Supreme Court in an opinion written by Justice Alexander Simpson, Jr. Fines totaling $250,642 imposed on the defendants, jointly and severally were sustained.

TEXAS

Permit to do business in Texas has been granted by the Secretary of State to the **Texas Bituminous Co.**, incorporated under the laws of West Virginia. Offices will be maintained at Dallas, with A. H. Johnson as state agent. The company will do a mining and wholesale coal business.

VIRGINIA

The only bid in the Norfolk market at present is for 12,000 tons asked by the **City of Norfolk**. The following bids have been listed: W. E. Deegans Coal Co., Huntington, W. Va., $1.63; Tildesley Coal Co., Charleston, W. Va., $1.73; Nottingham & Wrenn and Arundel Corporation, of Norfolk, $1.74 each; C. G. Blake, Crozer-Pocahontas Coal Co., Flat Top Fuel Co., Eastern Coal & Export Corporation, Smokeless Fuel Co., Johns Bros., all of Norfolk, $1.75; Hasler & Co., Norfolk, $1.80; Fayette Smokeless Coal Co., C. & O. Coal & Coke Co., Lake & Export Coal Co., and Dexter & Carpenter, of Norfolk, $2; Pocahontas Fuel Co., current market prices.

WASHINGTON

The coal fields around Cle Elum in the State of Washington have been producing more heavily during this spring than at any other time in seventeen years, according to R. B. Webb, coal agent for the Northern Pacific at that town. Commercial mines in the region have been finding a market for about all of their output. However, the production of the Cle Elum field for the year 1921 fell considerably short of that of 1920. The pick-up, now so noticeable, did not start in 1921 until September when some of the Cle Elum mines employed more men than they ever had before. The **Northwestern Improvement Co.**'s output for 1921 was 1,013,737 tons; that of the **Roslyn Fuel Co.** (which was closed down during the summer), 53,491 tons; the **Roslyn Cascade Coal Co.**, 103,207 tons, and the **Cle Elum Coal Co.**, 1,000 tons.

The Pacific Coast Coal Co. is steadily increasing its output. From a total of 11,876 tons for the week ended March 10, the total production jumped to 14,112 tons, an increase of 2,236 tons.

The Newaukum Coal Co. is developing a prospect on the north fork of the Newaukum River, fourteen miles from Chehalis. Operations are being conducted by T. R. Jones, M. A. Stewart and R. M. Shaver.

A coal vein is being developed on Coal Creek between the Leonard and the North Coast Power Co.'s properties on land owned by **Francis Donahoe** of Chehalis.

WEST VIRGINIA

The Consumers Fuel Co., operating at Randall in Monongalia County, is arranging to add additional equipment at its Eureka Mine. A cross-over dump is to be installed and the coal will pass through a dump hopper, a steel apron conveyor distributing coal to a four-track shaker screen. The present tipple will be enlarged and braced.

The Logan Island Creek Coal Co. has just awarded to the Fairmont Mining Machinery Co. a contract for the installation of a conveyor and a three-track shaker screen. The conveyor will be one of the longest one-piece scrapper conveyors ever installed and will be a part of the incline by which coal will be brought down the mountainside.

Through additional equipment to be installed at its plant at Jere on Scott's Run in the Monongalia field, the **Soper Mitchell Coal Co.** will be able to thoroughly prepare for market four-inch lump, two-inch egg and three-quarter slack at the rate of 350 tons an hour, which is about twice the present capacity.

Operations have been resumed at the Itman mines of the **Pocahontas Fuel Co.**, in the Wyoming field of southern West Virginia, where no coal has been mined during the last year. The mines began producing coal again on April 1. The fact that they are once again in operation is considered significant as showing that the company expects a marked increase in demand in the near future.

J. C. Green, of the Greenmar Coal Co. with headquarters at Buckhannon, was called to Elkins on March 21 by the death of his father.

After spending the greater part of the winter in Florida, **John A. Clark**, head of the Clark interests in the Fairmont region, has returned to his office there.

C. A. Clyborne, formerly Eastern sales manager for the Kentenia Coal Co., has become associated with The Three States Coal Co., as president. Offices are in Bluefield.

Officers and directors were elected at the recent annual meeting of the **Wysong-McCoy Coal & Land Co.**, composed largely of Bluefield capitalists, held in Princeton. The directors chosen are: Dr. E. F. Peters, A. F. Wysong, John K. McCoy, W. J. Elliott, John H. Reynolds, Cary C. Hines, Samuel J. Evans, W. H. Foster, Hartley Sanders, J. H. Gadd and George W. Lazenby. The board elected the following officers: A. F. Wysong, president; John K. McCoy, first vice-president; Samuel J. Evans, second vice-president; W. J. Elliott, secretary and treasurer. This company has purchased 10,000 acres of coal land in Webster County in which there are seven seams of coal.

Out of a total of 64 companies chartered in West Virginia in the month of February, eight of them, or one-eighth of the entire number, were coal concerns whose capital aggregated $7,425,000. The largest of these was the **Logan County Coal Corporation**, in which the Jones interests of Logan are largely represented. This company was organized and chartered with a capital stock of $6,000,000.

The Blocky Pittsburg Coal Co. has been organized and incorporated with a capital stock of $100,000, preliminary to the development of about 200 acres of Pittsburgh coal land, there being acquired along with this acreage a mine already opened and equipment which will make it possible to produce coal at the rate of 1,500 tons a day. This mine is near Clarksburg, and is so situated that its product can be shipped over the Baltimore & Ohio. Officers have been elected as follows: Stephen F. Elkins, of Morgantown, president; C. H. Wilson, of Fairchance, Pa., treasurer; Herbert F. Harker, of Morgantown, secretary. The above officers, together with W. J. Walker, of Uniontown, and Paul Talbott of Fairmont, W. Va., were the incorporators. The mine will be under the general direction of E. H. Reppert, of Morgantown, general superintendent.

About 4,000 coal cars are to be built for the Norfolk & Western for use on its lines in West Virginia, according to announcement made a few days ago at the general offices of the company in Roanoke. Authority to secure the additional equipment was granted at a meeting of the board of directors held in Philadelphia on March 22. The new equipment will consist of steel hoppers having a capacity of 70 tons. One company will build two thousand of the cars, another company 1,000 and still another company 1000.

The Kentucky and West Virginia Power Co. has materially added to its equipment through the installation of an 11,000 kw. turbine and transformers of equal capacity, and has the new machinery in commission. Work on the installation of the new equipment was completed on March 20 at which time it was cut in, giving the company much more power which will be utilized in West Virginia and Kentucky where new transmission lines are being built. The company finds it necessary to increase its available power in order to take care of the rapid development of the mines in Kentucky and West Virginia.

WISCONSIN

Coal men of the Duluth-Superior region met in Superior, recently, where a banquet was held. The speakers of the evening were **F. G. Hartwell**, Chicago, president of the Berwind Fuel Co., who talked on general business conditions in the country; **E. E. Heiner**, Minneapolis, vice-president of the Superior Coal & Dock Co., who also discussed the business outlook, and **J. L. McMahon**, Milwaukee, of the Northern Coal & Dock Co., delivered a talk on Americanism. Other speakers were **H. E. Smith**, St. Paul, vice-president of the M. A. Hanna Coal & Dock Co., and **G. G. Watts**, Minneapolis, general manager of the Great Lakes Coal & Dock Co.

The Valley Coal Co., a subsidiary of the Lehigh Coal & Navigation Co., is now firmly established at Milwaukee, and contemplates making improvements on its newly acquired dock on the Menomonee River.

The Reiss Coal Co., of Sheboygan, has contracted for a 5,000-ton steel steamer, which will be equipped with a self-unloading apparatus. This method of handling coal over the docks seems to be becoming popular, as it avoids the need of costly hoisting machinery.

BRITISH COLUMBIA

Coal lands situated in the Copper River District are to be subjected to systematic exploration by the **National Finance Co., Ltd.**, who is acting as liquidator of the Yorkshire & Canadian Trust, Ltd. This announcement was made recently in the course of an application before the Supreme Court of the Province for permission to proceed with diamond drilling. Activity in the development of coal areas of northern British Columbia has become marked in the past two years, chiefly for the reason that with the growth of Prince Rupert, and of settlements along the line of the Grand Trunk Pacific Ry., the local domestic market has materially expanded.

Problems connected with the coal mining industry of Vancouver Island, such as the affect of fuel oil competition, the possibility of popularizing pulverized coal, and the utility of improved methods of flotation of coal were discussed at a recent meeting of the **Vancouver Island Division of the Canadian Institute of Mining & Metallurgy**, held at Ladysmith. Thos. A. Spruston, superintendent of the Wellington-Extension Colliery of the Canadian Collieries (D) Ltd., presided and among those who gave addresses were Colonel J. E. Leckie, Dean Brock, Dr. Hanson, H. Mortimer Lamb, N. Thompson, and E. A. Haggen.

Recent developments in the industry of Vancouver Island are encouraging. New deposits have been opened up in the Reserve Mine, **Western Fuel Corporation of Canada**, and the Farm Mine, Comox, **Canadian Collieries (D) Ltd.** The collieries have been working steadily and the output is being well maintained. It is not anticipated that the mines of the island will be affected by the strike, the wages being regulated still by the Dominion Fair Wage Officers.

NOVA SCOTIA

The United Mine Workers' Executive Board, after a two-day meeting, decided in favor of the "strike on the job" advocated by Secretary-Treasurer, J. B. McLachlan. Eighteen men who loaded only half a day's normal stint had their places stopped. They were given work in a portion of the mine being worked double shift but only three accepted. **The British Empire Steel Corporation**, having 180,000 tons of stored coal is likely to close down the mines. However, most of the men are not "soldiering" on the job and unusually large tonnages are being produced despite the fact that the "flu" has weakened many of the men materially.

ONTARIO

In connection with the forthcoming coal strike in the United States it is recalled by the trade in Canada that during the crisis of 1919 Canada got quite liberal treatment from the United States, largely as a result of the efforts of Fuel Controller McGrath, who was successful in making representations to Washington officials that resulted in coal being diverted to Canadian consumers. There are complaints now that too liberal treatment was given Canada and that this must not be repeated in case of a coal shortage in the United States. In view of past experience it is apparent that measures may have to be taken by the Dominion Government to secure an adequate amount of coal for essential purposes in the event of a protracted deadlock. There is in stock at

Fort William 178,000 tons of bituminous and 70,000 tons of Pocahontas, in private hands mostly. This will be out of reach of central Ontario consumers. The C. P. R. is understood to have reserves amounting to 260,000 tons at Fort William, sufficient to carry the railway through almost any emergency. The Canadian National roads are not as well supplied, but they can secure additional quantities without much trouble. Toronto industries have a soft-coal reserve which will carry them over six weeks and the impression prevails that as a result of the strike hard coal will be cheaper.

WASHINGTON, D. C.

The uncertainty of the oil supply and the use of coal by oil companies and railroads was referred to in testimony before the House Appropriations Committee by Colonel J. W. Wadsworth, superintendent of the National Homes for Disabled Volunteer Soldiers, located in various parts of the country. He quoted Mr. Hurley of the Santa Fe to the effect that if Mr. Hurley could get coal at Leavenworth, Kan., he would burn it on every engine on that road. Representatives of the Sinclair Oil Co., and the Standard Oil Co., had advised the authorities of the homes against the use of oil for heating because changes in the process of refining had cut out by-products of fuel oil in the Middle West except as to smaller concerns. It was testified that the Standard Oil Co. refineries at Sugar Creek used coal as fuel. The oil men were quoted as saying there were no dependable sources for oil, as the large concerns were not producing fuel oil, and there was no certainty that the oil market would be stabilized in the Middle West.

The increasing use of the Ohio and Monongahela rivers for coal traffic was referred to by General Taylor of the Corps of Engineers, in recent testimony before the House Appropriations Committee. He stated that practically all coal used in Pittsburgh comes down the Monongahela, the commerce last year on the river amounting to 22,000,000 tons.

Representative Newton, of Minnesota, author of the proposed coal regulation bill, based on the original Calder bill, is seeking to have the House Committee on Interstate Commerce consider the measure. While this and other coal bills pending before the committee have been placed among the more important bills for consideration, the committee has not yet taken up the bill. At a recent meeting the committee rejected a motion of Mr. Newton, who is a member, to take up his coal bill, but instead took up three railroad bills amending the Transportation Act, on which hearings are now being held.

The Government coal washery in Alaska has been completed. Work is to begin at once so as to provide a considerable tonnage of coal which is to be used by naval vessels in the most thorough test to which Alaska coals ever have been subjected.

Association Activities

Hazard Coal Operators' Association

A meeting of the association was held in Cincinnati, March 28, with E. L. Douglass presiding. It was the regular monthly meeting but with numerous matters affecting the policy of the operators in meeting contingencies that would arise through a coal strike the most of the session was given over to this. Consideration was also given to a report from the traffic commissioner of the association, regarding changes which were being considered by the Louisville & Nashville on through rates all-rail, for coal being sent to the Northwest.

Traffic News

The I. C. C. has canceled the hearing in the complaint of the **Northwestern Pennsylvania Coal Operators' Association** assigned for April 26, at Pittsburgh.

In the complaint of the **Dyer Packing Co.**, an examiner of the commission recommends that the rate of 70c. a ton on coal from a mine near Bruceville, Ind., to Vincennes, from June 25, 1918, to Feb. 29, 1920, was unreasonable because it exceeded 45c.

In the complaint of **J. E. Isgregg and Clifford Connerly** an examiner recommends that the rates on bituminous coal from Jackson Hill mine in the Clinton, Ind., coal district to the railroad's team track at Clinton during Federal control were unreasonable.

The rate on bulk coke from Tupelo, Miss., to Atlanta, Ga., is unreasonable, according to a recommendation of an examiner in the complaint of the **Pratt Engineering & Machine Co.**

The petition of the **Northern Illinois Coal Operators' Association**, in the matter of intrastate rates in Illinois, has been assigned for hearing by the I. C. C. May 1, at Chicago.

The Northwestern Traffic Service Bureau has withdrawn its complaint involving rates on coal from Wood River, Ill., to Akron, Ohio. **The Proctor & Gamble Mfg. Co.**, has also withdrawn its complaint involving rates on coal from Mount Olive and Staunton, Ill., to Kansas City, Kan.

The commission has further suspended until May 4, proposed rates on coal from Illinois mines to points in Arkansas, Louisiana and Texas. Rates on coal from Wyoming mines to destinations in Utah south of Ogden have also been further suspended until May 4.

The Colony Coal Co., of Denver, has complained against unreasonable rates on coal from Dines, Wyo., to Seattle, South Omaha, Lincoln and Huntsman, Nebr., Lusk, Wyo., Oral, S. D., and points in Oregon, Washington, Idaho, California, Wyoming, Colorado, Nebraska, Kansas and Iowa.

Considerable dissatisfaction having been manifested against the rates on bituminous coal in the Western part of the United States, the Interstate Commerce Commission has concluded to institute an investigation into all such rates from producing points in Montana, Wyoming, Colorado, New Mexico and all states west thereof to destinations in those states and to El Paso, Tex. The general purpose of the investigation is to develop facts which will aid the commission in determining what would be the proper adjustment of rates on coal in the territory described, both with respect to the level of the interstate rates and the relationships as between the various producing mines or groups of mines. Hearings will be held during May at representative points, including Denver, May 10; Salt Lake City, May 15; Butte, Mont., May 19; Seattle, May 22; San Francisco, May 26; Phoenix, Ariz., June 5; and El Paso, June 7. Parties desiring to be present and offer evidence at any of the above-mentioned points should promptly advise the commission and the respondent carriers interested of the particular matters and rates which they desire to have considered. So far as practicable, it is desired that rates to points in Colorado be considered at the hearing at Denver, to points in Utah at Salt Lake City, etc.

In the complaint of the **Omaha Lumber Co.**, an examiner recommends that the rates on certain shipments of anthracite from Anthracite, Horace, and Crested Butte, Col., to Omaha, South Omaha, and Fremont, Neb., and on bituminous coal from Somerset, Col., to Kiron, Ia., were not unreasonable, but that two shipments from Anthracite to Omaha were overcharges, and the rate on one shipment from Crested Butte to Council Bluffs was unreasonable.

The complaint of the **Melcroft Coal Co.** will be heard at Pittsburgh, April 25.

The complaint of the **Walter Wallingford Coal Co.** will be heard at Pittsburgh, April 20.

Hearing in the complaint of the **Republic Coal Co.**, assigned for Minneapolis, April 20, has been canceled.

Coming Meetings

Southeastern Coal Merchants' Association will hold its first annual meeting on April 10 and 11 at Atlanta, Ga. Secretary, M. E. Patterson, Candler Building, Atlanta.

National Retail Coal Merchants' Association. Fifth annual convention at the Drake Hotel, Chicago, Ill., May 18-20. Executive secretary, Joseph E. O'Toole, South Penn Square, Philadelphia, Pa.

National Safety Council. Eleventh annual Safety Congress at Detroit, Mich., Aug. 28 to Sept. 1. Executive secretary, W. H. Cameron, North Michigan Ave, Chicago, Ill.

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

Missouri Retail Coal Merchants Association will hold its annual meeting May 16 and 17 at the Planters Hotel, St. Louis, Mo. Secretary, F. A. Parker, Arcade Bldg., St. Louis, Mo.

American Institute of Electrical Engineers will hold its spring convention at Chicago, Ill., April 19-21. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

National Coal Association will hold its annual meeting at Congress Hall, Chicago, May 24 to 25. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham.

Virginia Coal Operators' Association will hold its annual meeting April 15 at Norton, Va. Secretary G. D. Kilgore, Norton, Va.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 18-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

Chicago Coal Merchants' Association will hold its annual meeting April 11 at Chicago, Ill. Secretary, N. H. Kendall, Plymouth Building, Chicago, Ill.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 26 and 27 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Fidelity Trust Bldg., Indianapolis, Ind.

The Canadian Retail Coal Association is holding its annual meeting on April 6 and 7 at the King Edward Hotel, Toronto.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at the Stacy-Trent Hotel, Trenton, N. J., June 7 and 8.

Coal Mining Institute of America will meet Dec. 13, 14 and 15 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 911 Chamber of Commerce Bldg., Pittsburgh, Pa.

Obituary

James J. Bucklin, well-known coal operator of Brazil, Ind., died at the home of his son, H. E. Bucklin, of Indianapolis, Ind. He was treasurer of the Crawford Coal Co.

Willis Glover Townes, vice-president of Archibald McNeil & Sons Coal Co., Inc., of New York, died recently at Palm Beach, where he had been spending the past few weeks. Mr. Townes was well known to the coal trade and at one time was chairman of the financial committee of the National Democratic Executive Committee. He was a member of several clubs.

Henry Alexander Laughlin, a director of the Jones & Laughlin Steel Co., died on March 21, at his home, Greylock, in Chestnut Hill, Philadelphia. He was the son of James Laughlin, founder of the steel company. Mr. Laughlin was one of the first to recognize the value of the coal deposits on the Monogahela River and foresaw the advantages to be derived from them by Pittsburgh.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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The Principle at Stake

MOST folks in this country, both in the coal industry and out of it, are so busy trying to pin the blame for the strike on someone or some particular cause that they are overlooking the fundamental facts.

Foremost is the fact of the United Mine Workers. Here is the strongest union in this country and the only large industrial union. It is facing for the second time in its history a reduction in wages. It is not human nature for labor unions, manufacturers' associations or trade groups in any industry to hold together long unless they are of benefit to their membership.

There is more than coincidence to the fact that coal miners after a decade or more of fruitless struggle to band together during a period of falling prices and falling wages, first reached the stage of cohesiveness in the nineties, when prices and wages took the upturn that ended but a year ago. The struggle for markets for goods and for coal is less strenuous when the general tendency is upward than when the business outlook is doubtful. Initiated in 1898, the four-state agreement originally affected but those four districts making up the Central Competitive Field. Now it has been magnified in importance to where for many years it has influenced the wage settlements in other union and even in non-union fields.

There has been but one setback experienced by the union in its policy of making this four-state settlement, and that began in 1906. That year there was a reduction in wages—slight, but a reduction nevertheless, and the only one in the years from 1898 to 1922. State settlements were made in 1906, and in 1908 and 1910 the Central Competitive Field settlements were made without the presence of Illinois. In 1912 the four-state negotiations were resumed, as was the upward trend in wages.

From April, 1898, to April, 1922, there were fifteen wage settlements, of which one was a reduction, two represented no change and twelve were increases! Is it any wonder that with such a record the United Mine Workers has waxed strong in the hearts of its growing membership and in power in the industry?

This time, the sixteenth time, the necessity of a wage reduction is so obvious—the people of this country are so thoroughly convinced on this point—that the union could not, dared not, make wages the issue. But an issue there must be, for without an issue a union lack cohesive strength. It would have been fatal to the strength and prestige of the International miners' organization among its own members to have tamely submitted to a wage reduction. Having made a series of demands upon the operators and having been advised that those demands would not be granted, and knowing full well that the counter demands of the operators for reductions in wages must finally be met, the union has adopted a policy of saving what best it can out of the situation and has made the continuance of the national wage settlement through a Central Competitive Field agreement the main issue.

The strike is the logical course for the union when what it wants is refused. The officers of the United Mine Workers know full well that their hope of maintaining control lies in exerting the "full economic strength" of the union on some issue. To have retreated without a show of strength would have spelled the downfall of the officers. Better from their standpoint to have an organized strike with the leaders leading than to have what must most certainly have come about otherwise—unauthorized, outlaw strikes, with leaders helpless and protesting.

It is conceivable that under different leadership the United Mine Workers could have weathered this storm without resorting to the strike. Such a large percentage of radical membership as was revealed at the Indianapolis meeting in February would have made such an attempt hazardous, however. Few outside of the coal industry appreciate how great a change has taken place in the union in the past few years. From a constructive force it is becoming a destructive agency. With small regard for the public and none for the capital invested in the industry, it seeks control of the whole industry. John Lewis, reputed to be a conservative, has been obliged to outradical the radical to maintain his position.

What is best for the coal industry is best for both the miner and the operator. A vast controversy is raging; some five or six hundred thousand miners are on strike. What principle is at stake? The right of collective bargaining? No. The operators have not refused to meet the union officers for the negotiation of wage scales and conditions of work. In every field they have had their offers refused. In no instance have the employers of union mine labor declared for the open shop.

Is it some inherent right of the miner that is assailed, and for which he is fighting? No. Is it the integrity of the contract for which the miners are striking? Hardly, in view of the fact that in August, 1920, they wrecked that part of the contract for which they now demand adherence on the part of the operators, even though compliance be contrary to the law governing restraint of trade.

There is a fundamental principle at stake. It does not hinge on wages, working conditions or trade unionism. It is a principle as yet imperfectly stated by the operators but clearly recognized by both sides. It is whether a union out of hand shall through sheer collective strength come into complete control of the coal industry. The avowed purpose of the operators to abolish the check-off is evidence of their recognition that the power of the United Mine Workers must be curbed. The operators stand on the principle of making adjustments to suit changing economic conditions, the union for further entension of its power without regard for any other factor in the industry, whether operator or public.

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Miners' Union Gets Hearing

WHILE no one disputes that the United Mine Workers did a clever thing in influencing the Committee on Labor of the House of Representatives to open hearings at the beginning of the strike, the benefits to the Mine Workers have been in the influence the resulting publicity has had on public opinion. Congress has not been impressed in the same way as has the public. In Congress it is understood that a majority of the members of the Labor Committee are so pro-union that they are able to see but one side of this controversy. A recommendation as to legislation from the committee would have little weight. Any bill the committee might report out would be analyzed with unusual care.

The hearing has enabled the Mine Workers to emphasize in a new way that the operators will not enter into a joint interstate conference. The reasons given by the operators for not entering such a conference and for declining to accept Chairman Nolan's invitation are not being sufficiently impressed upon the public. The Mine Workers realize that their strongest point is the refusal of the operators to partake in a joint conference, and they are making the most of the opportunity that this hearing has provided.

Congress makes more enlightened use of the testimony taken at hearings than does the general public. So far as Congress is concerned the hearing is having the effect of bringing out in concise and easily understandable form the operators' side of the controversy. The operators' side of the case has been unusually well presented. It is quite apparent that they have made out a better case than have the United Mine Workers. The evidence that the operators are not seeking to destroy the union has been particularly convincing.

The expected has happened in this strike in every particular with the exception of the walk-out of the non-union men in Pennsylvania. As predicted, there has been no excitement over coal supply and it is not likely that there will be any, with so much unbilled coal at various points.

Production during the first week of the strike was no smaller than was expected, although our expectations were founded on a lack of demand, rather than non-union disaffection. If the coal consumer who does not require coal immediately will hold off attempts to buy now—if he will refrain from being stampeded at this critical juncture—there will be no runaway market. Non-union output will increase as it is needed. The railroads have made systematic preparation to insure 100-per cent car supply at all non-union mines. They are prepared to move coal cars for that purpose from the roads in the union fields.

Power of the Steady Run

DESPITE the strike, every operator should keep in mind the value of the steady run, for the present juncture is a good time to provide for future steadiness of operation. Provision made for putting in better machinery and for an advance in electrification can be made at no time more readily than during a strike, when none of the expedients necessary where the mine runs, however occasionally, need be installed to enable the work of reconstruction to be continued.

The way to run steadily is to cut prices, and the only way to do this legitimately is to reduce costs. A little lowering of expense on the daily output will have great value, for it will increase the steadiness of run, which in turn will lower the cost of production. With a slightly lowered cost due to mechanical readjustments, a further reduction in cost, due to spreading the costs of operation over a large tonnage, can be obtained. That in turn will make it possible to take more contracts and sell more spot coal and again shave the cost.

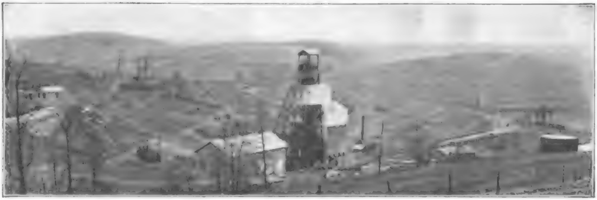
There is, of course, a limit to this process as the successive reductions in costs approach a vanishing point, but let it never be thought that the direct effect of a paring off of a few cents in the costs by mechanical efficiency is all that can be obtained. That slight reduction attacks all charges that are on a monthly basis—all the costs for power, all the depreciation, obsolescence and tax deductions, which with the irregular run are so exasperating. Furthermore, steadier work makes it possible to obtain and keep the best men, have at all times an adequate mine force and a town with every house occupied.

Modified Condemnation

WILLIAM R. INGALLS speaking on "Elimination of Waste and Improvement of Efficiency" before the recent session of the American Institute of Mining and Metallurgical Engineers, said: "The most noteworthy examples [of waste] are anthracite and bituminous coal mining, where, on the average, annual employment is only 200 to 250 days per annum." Edward W. Parker took exception to that statement, and we note with pleasure that in *Mining and Metallurgy* the words are repeated with "anthracite" omitted. Perhaps other changes have been made. As to this we are not quite clear. However, as it appears the statement can create no cavil. The words "There are about 700,000 men employed in bituminous coal mining, compared with about 150,000 in anthracite, wherein the labor conditions are much better," gives us more confidence, though the last phrase was not part of the paper as read.

However, we would still like to see part of the further comment in the article revised. Mr. Ingalls remarks (we quote his speech as reported in *Mining and Metallurgy*): "Anthracite coal mining is inevitably subject to seasonal conditions, just as is building, for we need more of that coal in the winter than at other times of the year. We may counteract this condition by maintaining production and putting coal into storage during the period of dull demand, which is in fact done on a large scale, but this does not meet the economic condition that the proper place for storage is where the coal is going to be used and our homes are not generally built with bin capacity for holding a winter's supply of coal."

This is indeed an amazing presentation, for in normal years the price differential and the fear of a winter's shortage have repeatedly made the summer trade in anthracite domestic coal as active as in winter, if not even more so, and during the present coal year without the price differential or rather, to speak more correctly, with the differential even reversed, the summer trade was more active than the winter. The fear of shortage caused cellars to be filled and showed that enough of such cellars had a capacity so adequate that the seasonal character of the use could be more than overbalanced whenever a fear of a failure of supply made people anxious to purchase coal. Of course, the winter is the more active period when summer strikes hold back the production in that period, but that condition is not raised by Mr. Ingalls' statement.



RAILROAD TIPPLE OF W. J. RAINEY CO.'S STEWART PLANT IS LOCATED REMOTE FROM SHAFT

Shaft in Connellsville Region Dumps Run-of-Mine Into Bins and Transports It by Larry to Tipple

Shaft of Stewart Mine Is Set as Near Railroad Tipple as the Property Limits and Unmined Coal Permit—An Electric Larry Links Shaft and Railroad Tipples

By Alphonse F. Brosky
Pittsburgh, Pa.

TO SUCH an extent has the development of the Pittsburgh bed progressed that today it is difficult to find an area that is not being extensively mined. Perhaps in no place is this bed of coal more thoroughly developed than in the Connellsville region, unless indeed it be around Pittsburgh, where the coal outcrops and is easily reached.

One of the last operations opened by the W. J. Rainey Co., of Uniontown, Pa., is the Stewart mine, at Southwest, Pa. Incidentally, it might be stated that this probably will be the last mine in this particular bed that will be opened in this region. It is said that the Stewart shaft gives access to the last virgin tract of Pittsburgh coal in Fayette County. The Stewart holding contains 366 acres and is almost entirely surrounded by workings that have caved.

A modern surface plant has been erected at this mine. Surface-structure costs, apportioned per acre, are higher here than at most operations. One seldom finds such substantial and complete buildings erected and such excellent equipment installed where such small acreages are to be developed. The idea is to obtain a relatively large output, reducing thereby the life of the mine, so that a quick money turnover may be obtained. An ultimate 8-hour output of 1,600 tons is expected, so that it may be assumed safely that the average production per day throughout the life of the mine will be approximately 1,000 tons.

The coal bed at this point is 8 ft. thick and, estimating the coal in the bed as running 1,700 tons per foot-acre, the coal obtainable will aggregate 4,500,000 tons on a 90-per cent recovery basis. It is probable, however, that a larger quantity of coal than that given will be recovered. It follows that the life of this mine will be somewhere between twelve and fifteen years.

The shaft has been placed at some distance from the railroad but as near as the position of the property will permit. In fact, all the coal lies to the south and west of the shaft, which has been sunk near the eastern property line, space being left only for the empty side of the shaft bottom and for the pillar which protects the property.

As has been mentioned, the coal area is practically surrounded by roof caves. This fact eliminated the possibility of the owner acquiring access to the railroad through solid coal. At the same time the topographical conditions prohibited the laying of a spur track from the railroad to the tipple. The ground elevation at the shaft is 60 or 70 ft. above the level of the railroad and could be attained only by a grade of about 7 per cent, an inclination too great, of course, for railroading. In one of the accompanying illustrations the topography is so clearly shown that it will be evident at a glance that existing conditions militated against a better layout.

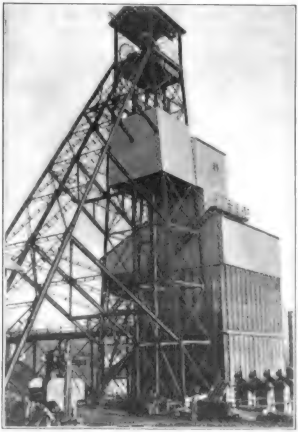
As is the case in most mines in the Pittsburgh bed, ordinary methods are employed in the mining and handling of the coal below the surface. The main haulage road and manway have been extended to the southwest boundary, a distance of approximately 5,500 ft. The summer months will see the development work far enough advanced for room driving. The coal hoisted at present comes solely from entries.

Forty-pound rail on the shaft bottom and 60-lb. rail on the main haulage lines are laid on a 42-in. track gage. A slight pitch of the coal is favorable to a good bottom layout. On the load side of the shaft bottom 2-ton mine cars coming from the northeast move down a grade of approximately 1 per cent onto the cages. After hoisting and discharge they pass to a kickback and thence gravitate through a turnout storage track which joins the main track at a point several hundred feet west of the shaft.

A concrete arch extends for some distance on either side of the landing at the shaft bottom. Further protection will be obtained by placing I-beams on 5-ft. centers for a short distance on either extremity of the arching. A two-compartment hoisting shaft is provided. This is 185 ft. deep and its inside dimensions are 10 ft. 6 in. x 22 ft. The concrete-lined airshaft is 235 ft. deep, the fan house being situated at a considerable distance vertically above the collar of the hoisting shaft. The airshaft is provided with a stairway for emergency use. Coal, supplies and men are raised and lowered in it.

The design of the headframe is unusual. It is of the 6-post type and of extra heavy construction. It is well strengthened with angle irons and angle-iron and plate ladder members. The posts and the main bracing are made up of H-beams. Steel of the same section is used also to tie the three-leg main bracing to the adjacent posts. It will be noted also from the illustration of this headframe that the interposed members are not horizontal but are placed normal to the main bracing. Three-leg main bracings and inclined compression members thereto are seldom seen in headframes in this country, although used in some European mines.

The tipple is fabricated of steel, the steps in the stairway being inverted concrete-filled channels. Other details are in keeping. The sides and bottom of the coal storage bin are of concrete reinforced with rods and expanded metal. The ridge-shaped bottom is protected by steel plates.



HEADFRAME AND STORAGE BINS AT STEWART MINE

A six-post structure of stronger construction than usual. The posts and main bracing are of H-beams. The struts between the back-leg and the vertical posts are normal to the back-leg instead of horizontal.

STEEL TIPPLE AT RAILROAD

The influence of railroad experience is seen in this tipple, which will have strains unusual for mine service, such as a concentrated traveling load of twenty-five tons and more, which will come to a stop and be dumped on this structure. At present the larry in use carries only eight tons.

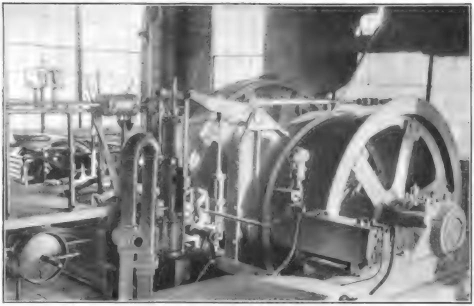
Coal is hoisted on Lepley self-dumping cages which discharge onto an apron extending over the bin. From this the coal drops directly into the storage pocket. Rock is bypassed into a rock bin by way of a chute controlled by a hand-operated gate. A house-coal chute is placed beneath the rock bin, discharging to a wagon road to the west of the main coal bin. A counterweighted gate controls the flow of coal into this chute, and a chain-wheel gate regulates the discharge from it. This chute is provided with a 1½-in. bar screen, slack from which falls into a bin below, at the bottom of which a lever-arm swing gate allows the passage of this material into one of the four main chutes leading from the great bin.

By the arrangement above described all the coal shipped is run-of-mine though a small quantity of screened fuel is prepared for domestic use. Four chutes are placed upon either side of the main bin, making eight in all. These discharge the contents of the bin into an electric larry that may be run underneath them on either side. The larry transports the coal from the tipple to a loading dock over the railroad tracks, a distance of approximately 1,400 ft. The slate-car landing directly beneath the rock bin is approached by way of a small trestle.

LARRY TAKES COAL FROM SHAFT TO RAILROAD

The larry that carries the coal to the railroad at this mine is of the type employed at coke plants for feeding beehive ovens. It has, however, been somewhat made over to suit local conditions. Certain changes were necessary, however, such as altering the side dumping arrangement to a bottom discharge. A protected trolley wire is strung along the side of the track and a side-pole trolley employed. The larry has a capacity of 8 tons and is capable of making a round trip in four minutes, including the time occupied in loading and discharge. Its capacity is ample for the present output of the mine. Anticipating the needs of the near future, however, the company has a 25-ton larry under construction in its Mt. Braddock shops. This is designed to transport 200 tons of coal per hour over the distance between the shaft and the loading dock. It will be similar in general design to the one in use at the present time.

The loading dock, together with its trestle approach, is constructed of steel, as shown in one of the accompanying illustrations. The supporting H-columns are securely anchored to heavy concrete piers, ten steel bents carrying the trestle and dock loads. It will be noted that the dividing line between the trestle and the loading dock is distinct. As might be expected, the trestle (on the left in the illustration) is of a lighter construction than the dock on the right, the former



Shaft Hoist

Coal comes to the 185-ft. shaft in 2-ton cars and is hoisted in this shaft to the surface. The expectation is that the tonnage to be handled will be less than 2,000 per day, or 250 tons (125 cars) per hour. Self-dumping cages are used.

structure forming part of a long-radius curve. Between the H-beam cap members of the bent I-beam, spreaders are placed. On these oak planks are laid laterally, upon which rest the ties and track rails, these latter being located directly above the spreaders. In addition to the members above named, channel stringers are placed along the sides of the trestle, adding strength to the whole.

The dock is of much heavier construction. The required rigidity is obtained by means of two 5-ft. steel-plate girders, amply reinforced by H-beam cross members. Coal is dumped from the bottom of the larry directly into a bin, the longitudinal section of which is triangular. This bin is lined with heavy steel plates and has a capacity of 54 tons. From this point the coal may be discharged to either of two tracks by way of two diverging chutes equipped with swing gates. The bin is so arranged that a 12-ft. screen may be installed at some future time if desired.

In the generator room near the tipple is located a 290-hp. motor-generator set and a 13 x 16-in. single-stage air compressor of the Laidlaw feather-valve type driven by a 260-hp. synchronous motor. This unit supplies air to the punchers, which are used exclusively for undercutting the coal. The switchboard is equipped with all necessary instruments, such as circuit breakers, ammeters and wattmeters.

A fire pump driven by a 40-hp. induction motor is installed in the basement of the generator room. This machine is started only in case of fire and increases the existing water pressure in the mains. An elevated reservair tank supplies water for town use, but its static head is insufficient for fire fighting. A smaller pump driven by a 5-hp. induction motor circulates water for cooling the compressor and supplies also the liquid controller by which the hoist is regulated.

Basements under part of the generator room or hoist house are coming into favor. They make it possible to locate small equipment, such as pumps and the like, where they are out of the way. Modern plans often provide for placing the control apparatus under the hoist-room floor, as that lessens the annoyance from the clatter of alternating-current control panels. This arrangement removes all secondary equipment from the ground floor, and the less the main hoist room is encumbered the less is the chance of accident. The hoist and generator rooms, in which most officials take a justifiable pride, may thus be made to present a better appearance.

Four Ways of Making Fuel Costs Lower

AN INTERESTING little booklet entitled "Four Ways to Make 6 Per Cent on Coal" is being put out by the Wentz Co., of Philadelphia, Pa. This takes up in non-technical terms many subjects in which the purchaser of coal should be vitally interested.

Some of the statements made should serve to focus attention on the items of expense in the operation of most power plants that are capable of material reduction. Thus at the very outset the statement is made that probably 55 per cent of industrial operations, taking them by and large, operate their boiler plants at less than 50 per cent efficiency. The items of cost entering into boiler-plant operation are four in number—fuel, labor, supervision and maintenance, including depreciation. These represent 78, 11, 5 and 6 per cent of total expenditures, respectively, on the average. It will thus be apparent how vitally economies in fuel affect total plant expense.

Classification of coals as well as the adaptability of various types to specific uses, the sampling and analysis of coal, correct methods of firing, firing tools and their uses, the care and operation of boilers, scale and its prevention, boiler settings, coal accounting, records, as well as coal storage and the prevention of spontaneous combustion are other subjects treated. All in all this pamphlet contains much information on subjects little understood by the average layman who nevertheless buys and uses coal for fuel.

THE NEW ORLEANS ASSOCIATION OF COMMERCE has requested the assistance of the Bureau of Mines in an educational campaign looking toward the abatement of the smoke nuisance in that city without necessitating the passage of legislation to accomplish the desired end. The Chamber of Commerce of Akron, Ohio, also has been in correspondence with the bureau regarding an anti-smoke campaign.

Reports and Investigations State Geological Surveys and Mining Bureaus

Pennsylvania Bulletins Describe Coal Beds Of Cambria and Greene Counties

DIFFICULTIES having arisen in printing the reports of the Pennsylvania Bureau of Topographic and Geological Survey, preliminary announcements and abstracts of the result of the survey's work are being sent out in mimeographed form. This method of presentation appears to be necessary if the public is to have any current record of what the survey is doing.

Some of these bulletins are reports just made available. Others are older and are inserted in the series in order to preserve a record of them. Copies of the older reports in the main are being sent to a selected list of libraries only. It is planned to distribute the bulletins prepared each month to libraries and those individuals most vitally interested. As before, their appearance will be announced in the newspapers. The first distribution includes only those numbers now ready; the other numbers will be sent out later as they are prepared.

Among these bulletins received by *Coal Age* recently are Nos. 23 and 24, both by J. D. Sisler and entitled "Coal Beds in Cambria County, Pennsylvania," and "Coal Beds in Greene County, Pennsylvania," respectively. These bulletins contain the following important features:

Cambria County ranks fourth in Pennsylvania as a producer of bituminous coal and ships more of this fuel for export than any other county in the state. It is one of the few counties possessing four important coal beds, although at least twenty-four coal deposits are recognizable, including the four important ones and five others which are workable locally, the rest being extremely thin.

The outcropping rocks of Cambria County are confined to the Quaternary System and to the Pennsylvanian and Mississippian series of the Carboniferous System. The Monongahela, Conemaugh, Allegheny and Pottsville formations alone are coal bearing. The four important coal beds are the Lower Kittanning, Upper Kittanning, Lower Freeport and Upper Freeport. Five other beds are mined locally, while the remaining eleven are so thin that they may never be worked. The other coals include the Mercer, Brookville, Clarion, Ben's Creek and Middle Kittanning beds. Numerous other small beds of unminable coal in the Conemaugh formation are scattered through 700 to 800 ft. of strata lying above the Upper Freeport bed. An impure coal lying about 775 ft. above the Upper Freeport and averaging less than 2 ft. in thickness has been correlated as the eastern remnant of the Pittsburgh bed in Cambria County. This coal has been worked a little, but is of small value.

The chief districts in the county where mining operations are carried on are the Barnesboro-Patton district, the Mountain district, the Black Lick district, the Johnstown-South Fork-Windber district and the Portage-Gallitzin district.

While much coal is mined in this county, there are considerable reserves that have not yet been touched, and are only now being prospected by means of the diamond drill. Drillings thus far conducted give promise that the remainder of the field will prove of equal value to those districts already known.

Bulletin 24 is devoted to the coal beds of Greene County and states in part: "Greene County has more unmined coal than any other county in Pennsylvania and is estimated to contain one-fourth of the reserves of the Pittsburgh bed in the state. So far, extensive coal mining has been limited to the Monongahela River district, where the Pittsburgh coal outcrops. The important coals, with the exception of the Waynesburg bed, have no outcrop in the county west of the Monongahela River and lie at great depth. Since the more easily accessible coal along the river is rapidly being worked out, shaft mining has started in other parts of the county. Drilling for oil and gas has shown several other coals below the Pittsburgh bed, but their identity is uncertain and it is impossible to present an estimate of their tonnage.

"Greene County has at least eight workable coals. The Pittsburgh bed is the only one that can be mined over large areas; the others are workable only locally, because they are, for the most part, too thin and dirty to be commercially valuable. Thirty beds are known in the county; they range from a few inches to 6 ft. in thickness, but average less than 1 ft. The Pittsburgh coal bed, which is the most important measure in this region, is characteristically a double seam having a roof division separated from a lower division by a clay parting ranging from ½ in. to 3 ft. thick. In the northern part of the county especially a roof shale 8 to 12 in. thick appears over the upper division of the bed. The roof division of the coal varies from 2 in. to 8 ft. in thickness and is cut by many clay partings. It is high in ash and sulphur.

"The lower and minable division of the bed varies from 3 in. to 9 ft. in thickness, including three persistent partings. These partings separate the lower division into four distinct benches: The upper or Breast, the Bearing-in, the Brick and the Lower Bottom. The Breast coal is generally the best and thickest part of the bed and in this county is free from distinct impurities. The Bearing-in bench usually is from 2 to 4 in. thick, with a thin bone binder above and below it. It is so soft that the miners use it to bear in on the other coal to gain a working face. It mines out as slack. The Brick coal is so named because the cleavage planes tend to make it break and mine out in brick-shaped blocks. As a rule, this coal is of excellent quality, although locally it may be impure. The Lower Bottom bench generally is quite impure and carries numerous shale partings. In places, however, a few inches at the top is clean and may be mined."

A STUDY OF THE METHODS OF MINING COAL is being made by the district and field engineers of the Bureau of Mines for the purpose of determining the percentage of extraction of coal together with its relative degree of safety. When a sufficient number of mines have been investigated in any particular coal bed, it is planned to summarize the methods of mining in a bureau publication, calling attention to any unnecessary loss of coal in the different methods of mining operations. A large amount of this investigative work has been conducted in Alabama, Oklahoma, Kansas, western Pennsylvania and Utah.

Liquid Air Boiling Away at Partially Regulated Speed Used to Supply Mine Rescuers and Rescued

Pure Oxygen Not Injurious—Highly Oxygenated Liquid Air Poured Into a Suitable Tank Evaporates, Furnishing Respirable Atmosphere—Four Types of Liquid-Air Apparatus

By Henry Briggs*
Edinburgh, Scotland

When Joseph Priestly discovered oxygen, in 1774, he inhaled the strange new gas and recorded a feeling of exhilaration. Many of us would feel exhilarated at making one of the most important discoveries of all time, whether we inhaled the product of our industry and good fortune or not. Unluckily, Priestly's excusable emotional uplift has been remembered, and pure oxygen has been, and still is, widely accredited with the property of producing a sort of intoxication in those breathing it.

Reputable men of science as well as quasi-scientific novelists—Jules Verne was perhaps the worst offender—have kept alive this hoary myth. There is, of course, not a shadow of truth in the belief that oxygen, when inhaled, causes intoxication. Breathing oxygen does not accelerate the vital processes; it does not produce a feverish burst of activity, muscular or mental; neither is the comparatively short time during which it is inhaled by, say, the wearer of a rescue apparatus, followed by a subnormal period.

To show in what quarters this particular fallacy is still entertained, I might recount the following incident: A colleague of mine, a professor of the medical faculty, informed me the other day that no one should be permitted to breathe highly enriched air except under what he termed "proper medical supervision." On my inquiring why, he replied that it was risky; the person might get an overdose and do himself harm. I assured him that his fears were groundless and that in scores of experiments I had made, men of all sorts—myself among them—had breathed 98-per cent oxygen for hours at a time, when at work and when at rest, without the least ill-effect. He was frankly incredulous!

Oxygen Harmful Only When Under Pressure

Only when self-contained apparatus is used under pressure, as by a diver, is pure oxygen deleterious to the wearer during the short time that it is breathed in practice. Under such circumstances, however, it is poisonous and must be considerably diluted with nitrogen to make it safe.

When, in the following account, mention is made of apparatus supplying its wearer with pure or nearly pure oxygen it should be borne in mind that in using the modern rescue equipment, of whatever kind, the elimination of nitrogen from the breathing circuit is sought, and that when highly enriched air is drawn into the lungs the animal organism accommodatingly takes from it only such oxygen as it may need at the moment and expels the remainder as if it were so much inert gas.

The liquid "air" used at the British mine rescue stations operating on that system contains, when freshly made, about 60 per cent of oxygen. It it stored and transported in Dewar vacuum bottles of copper or brass (see Fig. 1), each bottle holding about 50 lb. of the liquid. The average rate of tranquil evaporation of "air" in these flasks is about 3.5 lb., and, in exceptionally good flasks, about 2.5 lb. per day. As the boiling point of nitrogen at normal pressure is —196 deg. C. and that of oxygen —183 deg. C., the former boils away more rapidly than the latter. Consequently a liquid mixture kept in a Dewar flask slowly enriches itself in oxygen.

As a result of this automatic enrichment, the "air" actually poured into mine-rescue apparatus at these stations may contain anywhere from 60 to 90 per cent of oxygen—probably the average is about 70 per cent. Owing to the large excess used, no risk attends the employment of a mixture containing this proportion of nitrogen. For oxygen-administration apparatus the case is somewhat different, as in this instance much purer oxygen is desirable.

Air Should Have a Large Oxygen Content

I am inclined to view the production of 60-per cent air for rescue apparatus as marking a phase in the history of these appliances that is certain to pass away before long. The advantages of a high degree of purity are so evident, whether the liquid be used for breathing apparatus or for other purposes, that no one at the present time would be well advised if he were to install

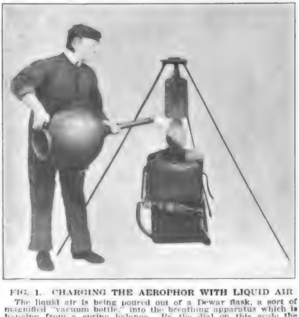


FIG. 1. CHARGING THE AEROPHOR WITH LIQUID AIR

The liquid air is being poured out of a Dewar flask, a sort of magnified "vacuum bottle," into the breathing apparatus which is hanging from a spring balance. By the dial on this scale the weight of liquid air received can be determined.

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*Professor of mining, Heriot-Watt College.

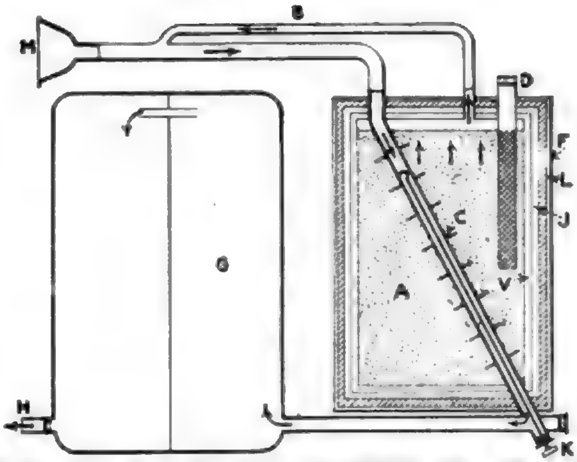

FIG. 2. AEROLITH, THE FIRST LIQUID-AIR APPARATUS

This has a vacuum similar to that in the Dewar flask, but the vacuum probably was found undesirable, for it prevented the air from evaporating rapidly enough for the needs of the wearer. As there was no regenerator to take away carbon dioxide, the air supplied the apparatus man was fit for breathing only when the apparatus was blowing off somewhat freely.

apparatus designed to yield liquid oxygen of any less than 95-per cent purity.

The first attempt to utilize liquid air for mine-rescue apparatus was that of Otto Suess, who, in his British patent specification of 1906, is described as an engineer of Mahrisch-Ostrau, Empire of Austria (now no more). Though it proved a failure, Suess' apparatus had elements of merit and formed the starting point for subsequent development. It is illustrated in Fig. 2. This apparatus, called—with a woful disregard for the rules of etymology—the "Aerolith," was carried in its entirety on the wearer's back. It was furnished with mouthpiece and noseclip or, more frequently, with a face mask or a half mask. (It will be remembered that in the early days of rescue apparatus these latter attachments, now discredited, were held in high regard.) The charge of liquid air was poured into the "pack" or air reservoir *A*, through the opening *D*.

The pack consisted of an inner nickel receptacle containing asbestos wool to soak up the liquid air; the inner canister was insulated (according to the patent specification) first by means of a vacuum, *V*; then by an air space, *J*, which in turn was covered by a layer of felt, *F*, and an outer casing of leather, *L*.

The nature of the compound insulation and of the inventor's claims make it clear that he did not realize the extremely high degree of tenuity necessary in a vacuum in order that it may act as a protection against heat conduction. Neither did he grasp the impracticability of maintaining, for even a short time, a high vacuum in a metal vessel unprovided with charcoal. As a matter of fact, no vacuum is needed with this form of receiver, which is intended to permit evaporation at a relatively rapid rate.

This probably was soon discovered by Suess, for the few Aeroliths imported into England made no pretenses of having a vacuum envelope. The warm expired air passed down the diagonal tube, *C*, into the bag, *G*, and out through a non-return valve at *H*. In traversing *C* the warm air evaporated a quantity of liquid air in the pack and the gas generated, flowing along *B*, was drawn into the lungs on the succeeding inspiration. The intention was in this manner to induce evaporation of a volume of air commensurate with the man's requirements. No attempt was made at regeneration.

It is obvious that such an arrangement, even if it functioned as the inventor intended, could only succeed in providing a sufficiency of air free enough from carbon dioxide to be usable when the flow from the pack was vastly in excess of a man's requirements during exertion. It is characteristic of such packs that they promote an evaporation which is excessive at first but which falls off rapidly as time goes on. Even with a considerably heavier charge of air than Suess recommended—he allowed one litre (2.3 lb.) for each hour of service—the rate of delivery of fresh air to the wearer would soon become dangerously scant if he attempted to work or to walk. The apparatus, in short, is unsound in principle. A further drawback lay in the tendency for ice to choke the tube, *C*. A wire, *K*, was provided to scrape out this tube from time to time; but the wire would itself freeze hard in position.

Another apparatus equally defective in design was that of G. Claude of Paris, described and illustrated in the *Engineering and Mining Journal* of Nov. 9, 1909. The chief present-day interest possessed by Claude's appliance lies in his employment of liquid oxygen instead of enriched air. He was, I believe, the first to show that there were no harmful results attendant upon breathing pure, or almost pure, oxygen for a few hours. He claimed, however, that by so doing the volume consumed by the wearer was much reduced. This is entirely untrue when the man is at rest, and is only true in a much modified degree if he is physically unfit and is attempting work. For all ordinary rates of exertion, the lung-ventilation of a thoroughly fit man is the same on oxygen as on air.[1]

The next step in the evolution of the liquid-air rescue apparatus took place in England and was due to the efforts of Colonel W. C. Blackett, now president of the Institution of Mining Engineers. His patents are dated 1910 and 1911, and his apparatus, the "Aerophor," has been in use for several years at British rescue stations; indeed the latest form of all is, in principle, fundamentally still his. In the flow diagram of the original Aerophor (Fig. 3) the parts to the left of the line *X* are carried in front of the wearer and those to the right on his back. The two flexible tubes shown immediately below the letter *X* pass around the body, a little below the waist level, one being on the man's left and the other

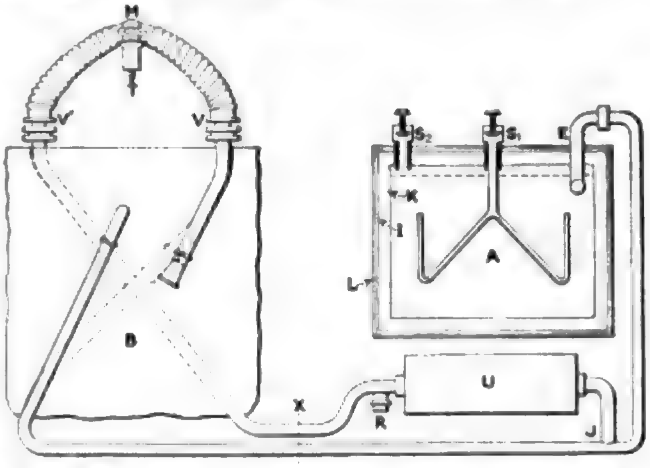

FIG. 3. BLACKETT'S AEROPHOR WITH REGENERATOR

The regenerator is not large because during much of the period of use air is blowing off freely. If the breathing bag becomes torn the two ends of the tubes can be connected, though one can hardly conceive of that being done in really deadly gas, and the carbon monoxide usually does its deadly work before the leak is discovered.

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[1] Briggs: *Journal of Physiology*, Vol. LIV (1920), p. 292.

on his right. The whole apparatus is attached to a canvas jacket which shifts the weight to the shoulders.

The rubber bag, *B*, is provided with a protective cover of canvas. The pack, *A*, containing asbestos wool, is insulated by kieselguhr, felt and a final covering of leather. The insulation permits the penetration of sufficient heat to volatilize the liquid air at the required rate. A charge of liquid varying from 6 to 10 lb. is poured into the pack by means of a funnel through the opening S_1. The liquid is distributed rapidly and evenly among the asbestos by the aid of a *W*-shaped channel of wire-gauze. During filling, a second vent, S_2, is kept open to allow of the ready egress of evaporating air, which otherwise would oppose the entry of the liquid.

Fig. 1[1] illustrates the operation of filling the pack with liquid air from a 50-lb. container. The apparatus is shown hanging from a spring balance, which in turn is suspended from a tripod. When the desired weight of air has been poured in, the vents, S_1 and S_2, are closed; the evaporated air then discharges through *E* into the breathing bag. On inspiration, the lungs draw air from the bag through the mica valve, *V*; on expiration they pass the air through a similar valve at *V'*. The relief valve is placed at *R*, between the expiration valve and the purifier, *U*. Owing to the large excess of evaporating air, especially in the early portion of a "run," much blows off to waste; indeed, during the first part of a two-hour training period the purifier does not come into action, there being such an evolution of gas and such a pressure (about 3 in. of water column) throughout the apparatus that every exhalation passes out through *R*.

No Use for Purifier with Air Blowing Off

This being the case, the inventor was justified in adopting a considerably smaller purifier than is permissible with a compressed-oxygen apparatus. He pushed the advantage too far, however, and used only about 15 oz. of granular caustic soda, or of a mixture of soda and slaked lime, in the cartridge. Later in the period of work when the evaporation is less rapid, the lungs can get the volume they require only by rebreathing a portion of the exhaled air; some of the products of respiration still discharge through *R*; the balance passes through *U* and rejoins the intake air at *J*.

Toward the end of a run, then, the apparatus becomes more and more of a regenerator. The ends of the tubes within the bag form a plug-and-socket connection to enable them to be joined (as indicated by dotted lines in Fig. 3) should the bag be torn during use. It is, however, practicable to "cut out" the bag in such a fashion only during the early part of the working period, when discharge from the pack is copious, and then only if the man moves very slowly.

Some Aerophors are provided with a tubular attachment that can be screwed over the relief valve, *R*, the other end of the tube having a face mask and a discharge valve. It is possible with this arrangement, during the first part of a two-hour interval, to supply air to another man wearing a face-mask. In this case the second man breathes the expired air of the first or rescue man. The performance is feasible, providing the rescue man so regulates his speed that his bag remains distended. The auxiliary tube would be of service in bringing men through a poisonous zone.

The latest liquid-air rescue apparatus is an improvement on the one just described. It is the result of the joint labors of G. L. Brown, manager of the North Midland rescue stations, and F. P. Mills, chief officer of the Northumberland and Durham rescue stations. I showed this apparatus in action before the British Association in September, and Figs. 4 and 5 are from my paper presented on that occasion.[2] In the former figure all below the line *XX* is carried at the back of the wearer, and all above it in front. The pack consists of an inner metal case *H*, divided into four compartments, *A*, by a gage framework. The compartments are tightly packed with dry, calcined asbestos wool. Surrounding *H* is an air envelope, *G*, connected at one corner by the pipe *D* to the inside of the pack and at the opposite corner by the tube *K* to the breathing circuit. Air volatilizing in the pack is thus forced to traverse the air space *G* on its way out. Outside *G* is a strong metal case insulated by a layer of magnesite asbestos, *F*, and a leather cover. Only one vent, *B*, has to be opened in order to fill the pack. A long-necked funnel is used in filling. The gage tube immediately under *B* is wide enough to prevent the uprush of gas interfering with the downflow of liquid. The working charge (4½ to 5 lb.) can be introduced, the funnel withdrawn and the opening *B* closed in one minute. As the cold air issuing from the pack has to flow through the envelope *G*, it automatically tends to check the heat-inflow to the pack during the early part of a run, when the evolution of gas is large.

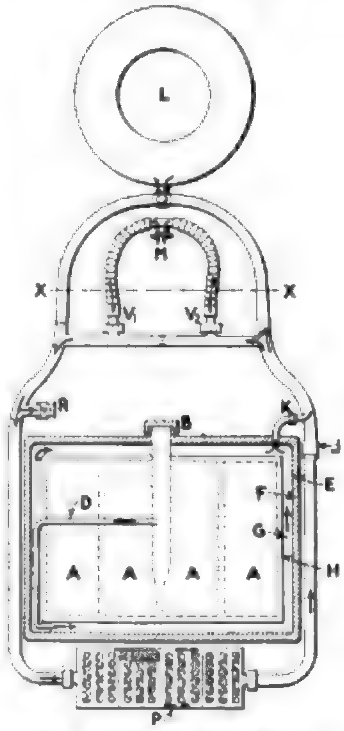

FIG. 4. BROWN AND MILLS APPARATUS

As the cold air passes around the pack it keeps it cool and when the evolution of gas is large it automatically checks the heat inflow to the pack.

Head harness, noseclip, mouthpiece, saliva trap and flexible tubes are the same as those employed in the Briggs compressed-oxygen apparatus; the head harness, however, has been improved since J. Cooper described it in *Coal Age*, Jan. 6, 1921. These alterations make it as difficult as possible for the wearer purposely or accidentally to draw in external air. In exchange, I have adopted the breathing valves (V_1 and V_2, Fig. 4) of the improved liquid-air apparatus, making them component parts of my own. These are the best I have yet tried for the purpose they are to fulfill.

Each consists of a seat of thick rubber to which is attached, by a central rivet, a smaller disc of thin rubber. The seat is perforated by a rosette of pear-shaped holes. The resistance and slip are low; the valve-box is smaller, neater and simpler than that required for a Rosling valve. The seat acts as its own washer and if the valve be inserted wrong side up, the passageway is entirely closed when the joint is tightened and the mistake is thus made evident immediately.

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[1] From First Report, Mine Rescue Apparatus Research Committee (1918), p. 12.

[2] Also *Engineering*, Oct. 21, 1921.

The tubular metal frame is bent over the shoulders at *XX* and makes a collar-shaped bend over the upper part of the chest, from the center of which the bag, *L*, is hung. The general make-up of the bag is best illustrated by putting two saucers together, edge to edge. This form cannot readily be flattened completely, either by suction or by external pressure. The bag is protected by a canvas cover.

Though the principle of action is the same, the new apparatus can claim the following advantages over the Aerophor:

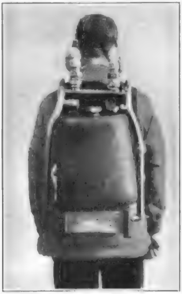


FIG. 5. BACK VIEW OF BROWN AND MILLS APPARATUS

The liquid air pack is carried on the back. Below it will be seen the regenerator, which is supported by the breathing tubes.

(1) Greatly reduced resistance to breathing. This is because the breathing circuit for the most part is made of brass tubing 1 in. in diameter, and because of the better construction of the purifier.

(2) A more complete removal of CO_2. This is due to the better arrangement and the increased charge (1¼ lb.) of caustic soda in the purifier, and to the introduction of a valve, *J*, which prevents the soda from being cooled by air flowing backward through *P* during the first part of the run.

(3) A reduction in the amount of liquid air required.

(4) More expeditious and less wasteful means of filling the pack.

(5) Better retention of the liquid air. Immediately after filling, the pack may be inverted without any liquid running out.

Excellent results have been obtained from this apparatus. The supply of air is copious and cool, and the complete absence of taps and high-pressure parts tends toward security.

The use of no other rescue apparatus is as easy to learn. When all joints and flexible parts have been tested for tightness by being held under water, and when the wearer has seen the proper charge of liquid introduced, he may dismiss the apparatus from his mind and concentrate his attention wholly on the work in hand. The only gage is an alarm watch carried by the leader of the party. The weight of the apparatus is 35 lb. when charged

From the point of view of the practical user of rescue apparatus, the snag—one exists—in the application of liquid air to this purpose lies not in the apparatus itself but in the means for storage and transport of the liquid, in the need for an almost daily use of the liquefaction plant to make up losses resulting from evaporation in the storage vessels, and in the high first cost of this equipment. The construction of the storage flask raises points of great scientific and practical interest, but their discussion falls outside the scope of this article.

It is, however, permissible to attempt a comparison of the cost of using the liquid-air and a modern compressed-oxygen apparatus. The figures here presented relate to British charges; they are converted into American currency at the normal rate of exchange.

It is, I think, necessary to warn the reader against accepting the costs of making liquid air or liquid oxygen as published in Germany. In the otherwise excellent bulletin of the Bureau of Mines entitled "Development of Liquid-Oxygen Explosives During the War" several statements of cost based upon German data are given. They should be taken with rather more than the usual pinch of salt.

FOUR POUNDS OF LIQUID AIR TO THE DOLLAR

I have carefully investigated the cost of producing liquid air in a plant of a size suitable for a mine-rescue station and for the comparatively limited output there required. Allowing for an annual output of 20,000 lb. of liquid air, taking wages at present rates, assuming depreciation at 10 per cent per annum, and making allowance for salaries, wages, repairs to equipment and buildings, power, water, lighting, chemicals and oil, depreciation, taxes, insurance, postage and other incidentals, I find that the liquid air produced (60 per cent oxygen) costs about one shilling, or 24c., per pound. It may be objected that the plants I have considered are not of the most recent design. This is indeed true, but for a new and up-to-date plant a much higher depreciation would need to be written off, as the purchase price has greatly increased since the English plants were acquired.

As about 1½ lb. of air is lost by evaporation during filling, to charge a rescue apparatus with 4½ lb. requires an expenditure of 6 lb. of liquid air. The cost of one training period thus will be about $1.44 for air and $0.26 for caustic soda, making a total of $1.70.

A modern compressed-oxygen apparatus (Gibbs, Paul, Briggs) carries a charge of about 10 cu.ft. of oxygen and 3 lb. of caustic soda. The booster compressors used at rescue stations are wasteful, and oxygen is lost in other ways. Taking such losses into account, an allowance of 15 cu.ft. per apparatus per charge may be made. At the price paid for compressed oxygen in Edinburgh, however, that volume costs $0.39; the caustic soda costs $0.63, and the total cost per practice period is thus $1.02. The use of apparatus using stick instead of granular caustic is more expensive.

REGARDLESS OF THE FACT that Illinois is the second largest state for railway trackage, there are not enough operating railroad tracks in the entire state to hold the cars necessary for the loading of the average annual Illinois coal production. Illinois has 13,189 miles of operating railroad tracks. One hundred and twenty 50-ton coal cars will stand on a mile of track, making a total of 1,582,680 cars that might be held on such tracks. The average annual production of Illinois mines during the five-year period ending June 30, 1921, was 80,000,000 tons, which tonnage would require 1,600,000 railroad cars, each of 50 tons capacity, for loading.

STUDIES, INVESTIGATIONS AND TESTS are to be made by the Bureau of Mines of the crushing strength of coal and supports. A manuscript is being prepared for publication by the bureau.

FIREMEN POURING WATER DOWN HOLLENBACK SHAFT AFTER FIRST VIOLENCE OF FIRE HAD ABATED

Putting Out a Mine Fire in a Big Anthracite Shaft

Conflagration of Unknown Origin Completely Gutted the Hollenback Hoisting Shaft—As It Occurred on a Holiday, Only Four Men Were in the Mine, All of Whom Escaped

By Dever C. Ashmead
Kingston, Pa.

A FIRE so fierce that it reversed the direction of the air current, despite the pull of the fan, and ignited the shaft timbers, shooting 75 ft. above the shaft collar, occurred Oct. 29 at the Hollenback Colliery of the Lehigh & Wilkes-Barre Coal Co., which lies within the corporation limits of the City of Wilkes-Barre, Pa. Fierce as the fire was it failed to ignite the wood breaker, which was separated from the headframe by a covering of corrugated steel.

The main hoisting shaft of the Hollenback Colliery has six compartments, of which four are used for hoisting and two as pipe ways. All compartments of the shaft extend downward to the Red Ash bed, which at this point lies 941.8 ft. below the surface.

The headframe is of steel and immediately adjoins the breaker. Such buildings are rarely placed so close in the anthracite region, for newly built breakers are required by law to be at least 200 ft. from the shaft. This building, however, was constructed before the law in question was passed. The basic idea behind this statute is that, in case the surface buildings of a colliery catch fire, the flames will not be communicated to the mine and will, therefore, not prevent any men that may be at work below from reaching the surface. In this instance, however, it was the mine that caught fire and the breaker that was imperilled.

The origin of the fire was mysterious. At about 10 o'clock in the evening before the fire occurred the shaft was inspected from top to bottom. This done, the men who made the inspection descended to a point about 200 ft. below the Baltimore bed to renew some of the sheeting between the wall plates. At 2:30 in the morning they ascended to the surface in order to allow the firebosses to enter and examine the Red Ash workings. At 3 a.m. they descended to clean out the drainage rings above the Abbott bed at a point about 75 ft. below the surface. They worked here until 3:20 a.m., when they returned to the surface to allow the firebosses to ascend from the Red Ash to the Baltimore bed.

They then went back to the drainage rings and worked until 4:30 a.m., when they again returned to the surface to allow the stable boss to go from the Red Ash to the Baltimore bed. The stable boss held the cage at this point for about 20 minutes while he bedded and fed eleven mules, after which he returned to the Red Ash bed. At 5 a.m. the shaftmen returned to the drainage rings and worked until 5:30.

At 6:40 a.m. three men descended from the surface to the Red Ash bed and at 7:30 a.m. the timekeeper, stable boss and four men came up the shaft from the Red Ash to the surface. At the end of this trip the shaft was turned over to the outside carpenters, who started to renew the guides in the headframe. In all this time, though the shaft was well traveled, no trace of fire or smoke was observed.

No electric wires of any kind, other than the telephone wires, which are laid in conduit, are located in this shaft. Electricity is not used underground at this mine, so the fire cannot be laid to a short-circuit of electrical conductors.

After 7:30 a.m. on that day only four men were underground in the mine, for Oct. 29 was Mitchell Day and the colliery was idle. One pumpman was stationed in the Red Ash pumproom to the east of the shaft and on the intake of the No. 2 airshaft. Another pumpman was tending the pump of the Baltimore bed. At 9 a.m. this man noticed smoke in the shaft. He accordingly telephoned to the pumpman at the foot of the shaft, who ran out and likewise saw the smoke. They then

FIRE LEAPED FROM THE SHAFT TO POINTS SEVENTY-FIVE FEET ABOVE THE GROUND LEVEL

It is remarkable that the fire did not attack the breaker. Nothing but a covering of corrugated steel and the watchfulness of the fire department saved it from this action. One finds it difficult to believe that a fan was trying to make this a downcast, so completely has the heat of the burning timber reversed the air current.

telephoned the surface and notified the hoisting engineer. An alarm of fire was turned in.

At this mine the main hoisting shaft was the intake for about 225,000 cu.ft. of air per minute. Two fans are in operation, one on the No. 1 airshaft, which extends downward only to the Baltimore bed, and the other is on the No. 2 airshaft, extending downward to the Red Ash bed. These fans combined handle about 591,000 cu.ft. of air per minute, but as this volume of ventilating current comes from several intakes, only the quantity of air previously stated descended the main hoisting shaft. The accompanying cross-section of the mine shows the general direction of the air currents within it.

At 9:10 a.m. the direction of the current of air traveling in the main hoisting shaft reversed from downward to upward, and a sheet of flame ascended to the surface and rose above the shaft opening to a height of 75 ft., largely enveloping the headframe. Fortunately, the side of the breaker nearest the shaft had been covered with corrugated steel, so that this in a measure protected the building. This steel covering had been placed on the breaker to protect the shaft in case the building should catch fire. It was extremely useful, however, under the reverse condition, for had it not been in place it is probable that the breaker would have been burned down.

The city fire department arrived upon the scene soon after the alarm was sounded and in a short time ten streams of water were turned upon the fire. By 10:30 a.m. the top of the shaft had been covered with sheet iron laid on rails. The firemen were then able to approach close enough to the shaft to direct the streams of water from their hose directly down the shaft. By 11 a.m. the fire was under control. At about this time also the air current again reversed. Before doing so, however, it remained in apparent balance for about fifteen to twenty minutes.

In the meantime the two men who were at the foot of the hoisting shaft in the Red Ash bed when fire was discovered had escaped to the surface by means of the No. 2 airshaft, in which an accommodation hoist was operating. The man in the pumproom of the Baltimore bed first tried to close the doors at the end of the shaft station, but, being alone, he was unable to move them. Probably it is fortunate that he was unable to do so, for if he had succeeded he might have lost his life.

He then broke open a sluice and turned into the heading the water that ordinarily goes to the pump, allowing it to run down the hoisting shaft. He next tried to get the mules out of the stable, but was unable to do so. He then made his way back to the rock plane and from there to the Hillman slope and thence to the surface. Not until 12 noon did he finally emerge from the mine.

COAL CATCHES FIRE FROM SHAFT BUT IS PUT OUT

During the afternoon a line of hose was run down the Hillman slope to fight any fire that might have spread into the coal measures through the openings to the hoisting shaft. Conditions at that time were precarious. The mine was full of smoke and fumes, and no information was available as to the extent of the fire. At about 4 p.m. the top of the shaft was boarded over, openings, however, large enough to allow the hose to be inserted being left. Water was played down the shaft for a number of days to make sure that the fire was extinguished.

The coal in the openings into the Hillman and Kidney beds was found to be on fire. This was fought by direct attack, using the hose taken down the Hillman slope. In the Hillman bed the coal itself had been ignited and once when it was thought that the fire in that bed had been extinguished, it broke out again and had to be again drenched with the hose. No fire was found in the Stanton or Abbott bed although these opened into the hoisting shaft. There is no opening from the shaft into the Five-Foot bed and the Baltimore shaft station is constructed of concrete, so no damage was done at this point.

Refuse from the burned shaft timbers and rocks loosened by the heat fell down the shaft, filling it from the Red Ash bed to a point above the Ross bed. In the Baltimore bed burning timbers lodged in the shaft landing at this point. These were smoldering when finally reached. The refuse in the bottom of the Red Ash portion of the hoisting shaft continued to smolder for five or six weeks before being finally extinguished.

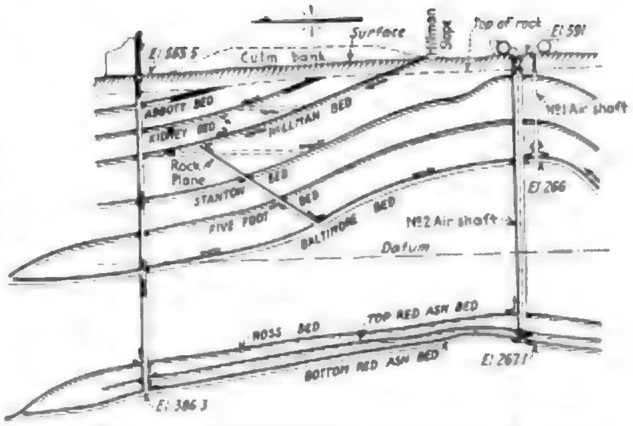
From the Hillman bed downward to the Baltimore all the shaft timbering was completely destroyed. Above the Hillman bed the timber was burned somewhat but did not fall. The surface of the cribbing was charred, but for only about ¼ in. in depth. Below the Baltimore bed the condition of the shaft is yet unknown.

The column pipes, of course, were destroyed, so the water made in this mine is accumulating in the old workings to the north of the shaft. Ordinarily the surface water is collected in rings at the top of the rock and does not flow down the shaft. Water from the upper workings is collected in the Baltimore bed and pumped from there to the surface, and the pump-room of the Red Ash bed lifts only water from silting.

As the fire has temporarily suspended silting, little water is entering the workings below the Baltimore bed and what there is can be collected readily in the old workings. A borehole has been driven from the Hollenback to the South Wilkes-Barre colliery of the Lehigh & Wilkes-Barre Coal Co. and the water made in the Hillman bed and the measures above is run through this borehole into the latter colliery, and from there is pumped to the surface.

Mining is now being conducted in the Baltimore bed and the measures above it, the coal being sent to the surface through slopes. Here it is transported to the Hollenback breaker and hoisted up the headframe, which in this case acts as a hoist tower.

The shaft is being repaired for hoisting and up to the present time over 400 ft. of timbering has been put in place. The method employed in retimbering this shaft is shown in one of the accompanying illustrations. When work began it was found that near the surface the timber was sufficiently strong to hold a working platform from which vantage point the old timbers immediately above could be removed and new bearing sets put in place, operations being continued until the bearing set above was reached.


Surface
Hillman Slope
Top of rock
El. 591
El. 565.5
Culm bank
Abbott bed
Kidney bed
Hillman bed
Rock Plane
Stanton bed
Five foot bed
Baltimore bed
No. 1 Air shaft
El. 266
No. 2 Air shaft
Datum
Ross bed
Top Red Ash bed
Bottom Red Ash bed
El. 267.1
El. 306.3

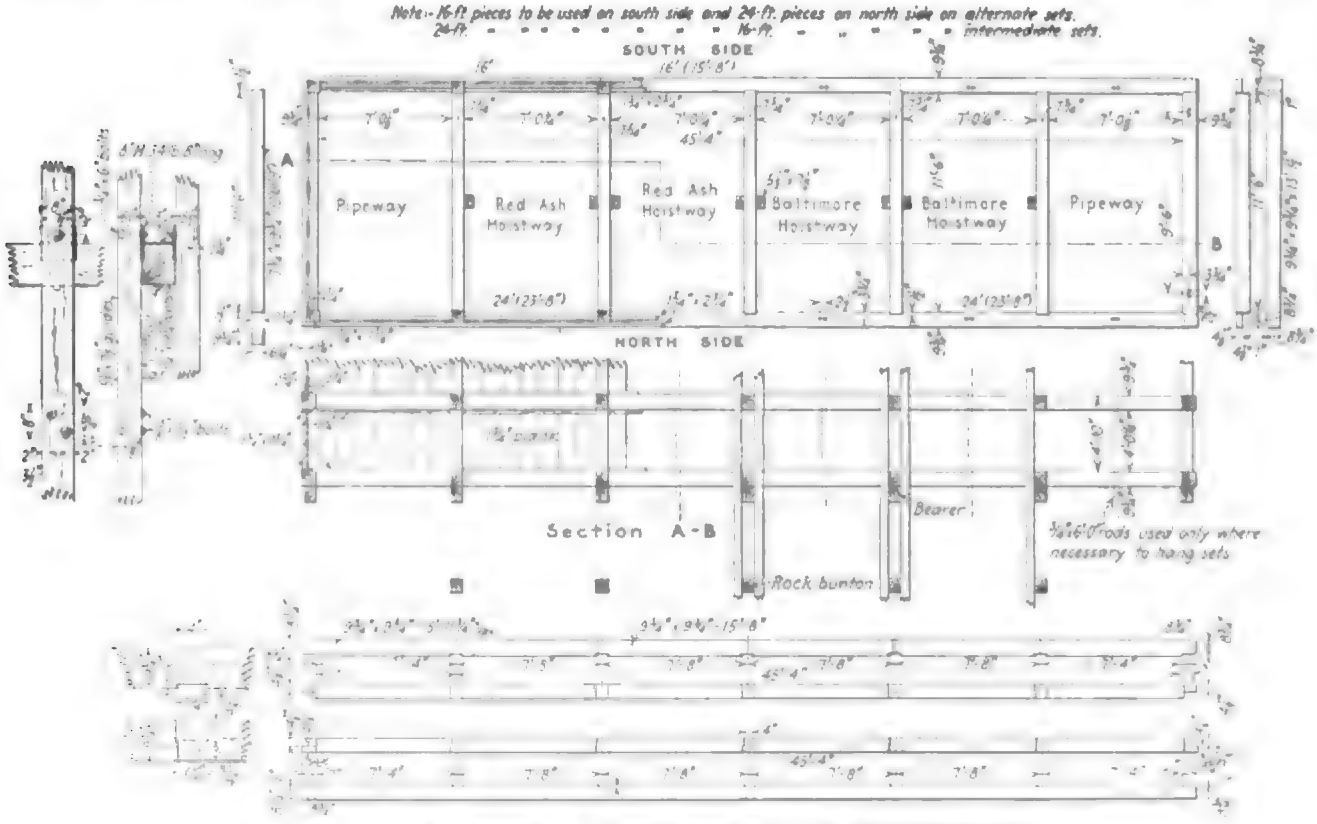
DIAGRAMMATIC CROSS-SECTION THROUGH SHAFTS

The smoke was first discovered by the pumpman in the Baltimore bed. He telephoned to the pumpman in the Red Ash bed, who reported after running out toward the shaft that he also saw the smoke. No one knows where the fire started or how.

Where the timbering was in bad condition or entirely gone, however, it was necessary to swing the platform from the bearing sets above. This was done by means of chains 60 ft. long. One end of the chain was looped around the bearing set and a loop also made in the other end. Men were lowered in a bucket and beams were placed across the shaft through the loops of the chain, thus permitting the men to lay a platform whereon to work. Bearing sets are placed about 45 ft. apart, and timbering operations are conducted upward from these sets.

As far as the work has progressed, practically full sets of timber have had to be used. The condition of the side walls was such that it was impossible to use rock buntons.

Before swinging the platform, in order to be able to place the new bearing sets, it is necessary to trim the


Note:- 16-ft pieces to be used on south side and 24-ft pieces on north side on alternate sets.
24-ft " " " " " " " 16-ft " " " " " intermediate sets.
SOUTH SIDE
16' (15' 8")
45' 4"
A
B
Pipeway
Red Ash Hoistway
Red Ash Hoistway
Baltimore Hoistway
Baltimore Hoistway
Pipeway
24' (23' 8")
NORTH SIDE
Section A-B
Bearer
Rock bunton
rods used only where necessary to hang sets

DETAILS OF TIMBERING AT HOLLENBACK MAIN HOISTING SHAFT

It has been found that the heat has weakened the rock so that complete timbering sets are necessary.

walls of the shaft and to remove any old burned timbers, so that the men may work safely. As the bucket operates in only one compartment it was impossible to reach the walls in any of the other compartments. Accordingly a series of sheaves was placed above the other compartment and the rope was uncoupled from the bucket and placed over these successively. By this means it is possible to operate in any one of the compartments.

It is hoped that below the Baltimore bed it will be possible to use rock bunton sets. Since Nov. 14, when recovery of the shaft was begun, more than 400 ft. of it has been reclaimed. It is now hoped that the work will proceed rapidly to early completion.

After the fire, when the platform at the top of the headframe was cleaned off, enough charcoal was removed from it to fill a 3-ton mine car. The breaker itself caught fire twice, but the firemen were able to extinguish it before any appreciable damage had been done.

Whether or not it was fortunate that the fire occurred on a day when the mine was idle is an open question. It is probable that if the mine had been working the fire would either not have taken place or would have been discovered in an early stage of its development. In that event it probably would have been extinguished before any serious damage had been done. On the other hand, had the mine been working and had the fire reached the same ultimate intensity before the men were removed, one of the greatest mine disasters that this country has ever known might possibly have occurred. How or where or why the fire originated is as yet unknown.

High-Volatile Slack Burned Smokelessly By Specially Designed Boiler Furnace

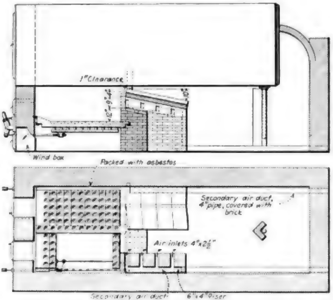
When high-volatile coal is introduced into a boiler furnace its volatile constituents are distilled. The fixed carbon remains upon the grate, and oxygen for its consumption is supplied by the air moving upward through the grate bars. The volatile hydrocarbons given off during distillation pass on through the furnace and boiler passages mixed with the depleted air and with other products of combustion from the fixed carbon. In order to burn the combustible gases successfully they should be mixed intimately with an adequate supply of air and given time and space wherein the chemical union of atoms may take place. Furthermore, they must not be exposed to any source that will chill them below their ignition point. To accomplish these results the furnace shown in the accompanying illustration has been designed by William J. Manhire. In this furnace air for the combustion of the fixed-carbon content of the fuel is supplied by forced draft introduced into the ashpit, and passes thence up through special rocking gratebars provided with tuyere blocks. These tuyeres are of such shape that they are held in place by gravity and admit air under pressure to the fuel bed in thin hollow conical jets which, striking the fuel and each other, are broken up, giving approximately an even distribution of air to the burning mass.

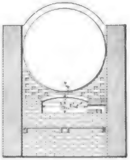
Burnable gases distilled from the fuel bed are choked between a sloping firebrick arch and the bridge wall. Here they are intimately mixed with a secondary air supply which, entering through small apertures in the brickwork, distributes itself along the path of the gases. This air enters the furnace through ducts which are built along the floor of the combustion chamber and extend from the rear of the setting to the bridge wall. The air thus preheated moves from these ducts upward to the apertures above mentioned.

GASES ARE AFFORDED SPACE IN WHICH TO BURN

After leaving the firebrick arch the gases enter the combustion chamber, where they are afforded ample space and time in which to burn before they reach the boiler tubes. It is asserted by the maker that this furnace will successfully burn the poorest grades of high-volatile slack practically without smoke and with high efficiency. An engine-driven fan furnishes the forced draft under the grates. This unit is automatically controlled from the boiler pressure, a drop below a predetermined point speeding up the fan and a rise above such a point slowing it down.

Equipment for this furnace is now being marketed by the Thomas Engineering Co., of Kansas City, Mo. Some installations of this kind have been in service for as long as five years, or a sufficient length of time thoroughly to demonstrate their utility. Obviously they are particularly adapted to small plants or those not large enough to make an installation of automatic stokers commercially feasible. High boiler ratings may, of course, be obtained.



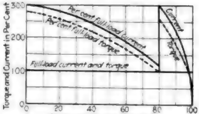


Furnace for Low-Grade Coals

The idea used to be "get the hot coals as near the boiler as possible, so that it cannot fail to get all the heat." Nowadays we try first to see that the coal is burned completely, and with the heat in the gases the boiler should not fail to absorb it.

Induction Motor of High Starting Torque

EVER since the high utility of the induction motor was first recognized, means have been sought to increase its starting torque. The low turning effort of this type of machine when starting is usually considered as its greatest shortcoming for industrial purposes. The speed-torque characteristics of the ordinary squirrel-cage induction motor are exactly the opposite of what they should be—that is, the current input is high and the turning effort low at the start, the former decreasing and the latter increasing as speed is gained. When started by means of a compensator, as the energy is taken at a low power factor, several times full-load current is drawn from the line. This is not only detrimental to other apparatus operated from the same circuit but constitutes a distinct fire hazard. In adapting the induction motor to the driving of machines which require a high starting torque three problems are involved: To design a machine that when starting would draw not more than three times full-load current; to provide that it would simultaneously develop nearly three times full-load torque and to plan it so that it would maintain a power factor during start of from 80 to 90 per cent.



GRAPH OF CURRENT AND TORQUE

Both full-load current and full-load torque at the start have values nearly three times that which they have at full speed. By the time the motor has reached 80 per cent of its synchronous speed these values have fallen almost to their running levels, whereat a switch is automatically thrown. This restores the current and torque almost to their original values, bringing the motor rapidly to speed.

To effect these results the Self-Start "TR" induction motor has been developed by the Triumph Electric Co., of Cincinnati, Ohio. The rotor windings of this machine are peculiar. They are made of materials of differing electrical resistance so connected that when the switch is in the starting position proper total resistance for starting is offered. Full voltage is impressed upon the machine at the start. Consequently a compensator is unnecessary, and the switch may be placed anywhere in the line.

GOVERNOR AND SWITCH GUARDED FROM DUST

A centrifugal governor of simple design is mounted on the motor shaft. At a predetermined speed this governor functions automatically and entirely independent of the operator, cutting out the high-resistance windings. The governor usually is set to operate at 80 per cent of synchronous speed. When it throws the switch the machine quickly comes up to full speed. Until the switch is closed the resistance of the windings holds the current input to within the predetermined maximum. Both governor and switch are inclosed so that dust and dirt cannot interfere with their operation.

Because of its simplicity and lack of auxiliary equipment the initial cost of a motor of this kind is small. The requisite size of an ordinary machine is in many instances determined more by the starting torque necessary than by the running load. As with this machine the starting torque is high the size is determined by the normal load. Under continuous service the temperature rise does not exceed 40 deg. C. Hence the insulation cannot be injured by excessive heat.

Because of its design and the details of its construction this motor is admirably adapted to remote control. The machine may be started and stopped in a perfectly normal manner by means of a push button or switch placed at any point in the circuit. Similarly it may be started and stopped by a float in a tank, by a pressure regulator, or like devices. On test, in one case after 50,000 starts the contacts operated by the governor were found to be bright and in good condition.

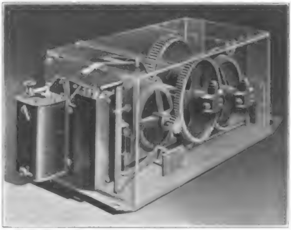
This Room Hoist Is Totally Inclosed To Forestall Accident

IN THE darkness or semi-darkness of the mine, machinery of any kind is none too safe. Yet the output of the modern mine depends largely upon the degree to which it is "mechanized."

Where a locomotive is not used to tram coal in rooms, the work is still largely done by hand, except where the cars are too heavy or the grade too steep. In such cases some sort of a room hoist is highly advantageous. To meet this service as well as to fill the need for a small hoist elsewhere about mines and industrial plants the Treadwell Engineering Co., of Easton, Pa., recently placed upon the market the machine shown in the accompanying phantom illustration.

In order to effectually guard this hoist and render it as safe from accidental contact as possible it is entirely incased in a steel-plate box, only the control device and levers being placed on the outside. Within the box a 5-hp. motor operating at 1,200 r.p.m. drives an 8 x 12-in. drum through double back gears. The heavy sheet sole plate with its ends projecting beyond the box and bent upward facilitates movement of the machine from place to place. A hinged door or cover on top of the box gives access to the machine within.

Over all, this machine measures 2 ft. x 2 ft. x 4 ft. 6 in. Not only is it used underground as a room hoist but it also finds application for various purposes on the surface, such as hoisting material to track level on tipples and breakers and in similar operations. It may be employed to advantage also in construction work or wherever current is available and a moderate rope pull is desired.



GUARD COVERS THE ENTIRE MACHINE

The drum will hold 1,500 ft. of ⅜-in. wire rope and give a pull on the rope of 1,500 lb. at a speed of 100 ft. per minute.

Problems of Operating Men

Edited by James T. Beard

Getting Back to Normal Wages in Coal Mining

Present General Depression in Business Calls for Remedy—Deflation of Wages Must Follow Inflation of War Period—High Wages Develop Lack of Thrift—Labor Needs Good Leadership

FORESHADOWING a reduction of miners' wages early in the spring, there appeared in *Coal Age*, Nov. 3, p. 710, an editorial entitled "Wages and Salaries." The writer based his forecast on the general depression of business, which all will agree was good grounds for the prediction made at that time.

In view of the growing importance of the subject of miners' wages, in the world today, permit me to offer a few thoughts bearing on the conditions that surround the miner and his duties, at the present stage of the game. There is no question but that the present general depression in the country calls for an adequate and immediate remedy.

DOES THE MINER REALIZE WHAT HIS LABOR MEANS TO THE PUBLIC?

Whether or not the miner realizes it, he has reached a time in his history when he must enlarge his vision and take an active part in the new order of things about him. By reason of the nature of his labor and its growing importance to the nation, the miner today belongs to humanity, in a very special sense. It would be well, also, if coal operators would regard themselves in the same category.

Capital and labor are alike responsible for the peace, happiness and prosperity of our country. Neither of them can shirk this responsibility. In the readjustment of the wage scale that must now come, miner and operator must get together in the spirit of fairness to each other and in the interest of public welfare.

Miners who do their own thinking cannot fail to see that immediate deflation of their wages is inevitable. It must come if we are to get back to normal living conditions. Common sense should teach that the inflation of the war period must naturally give place, now, to a deflation in wages and prices worked out on the basis of supply and demand and not through any arbitrary ruling of labor organizations.

What labor needs most today is leadership. Never in all its past history has that organization needed good leaders more than now. In the forthcoming economic industrial struggle, let selfish considerations give place to a broadminded regard for public good. As public servants, let both miner and operator stand shoulder to shoulder for the public welfare.

The question of wages directly concerns every miner, affecting as it does his bread-and-butter supply. There was naturally no howl, a few years ago, when miners' wages shot skyward under the urgency of war conditions; but there is equal urgency, today, for a return to the old standards.

Without question, deflation must begin with the price paid the miner for digging coal, since that is the basis of the computation of all prices for material, transportation and general labor. COAL is the underlying factor in all the activities of life. Its price controls the price of every living necessity.

Freight and passenger transportation are regulated, primarily, by the price of coal, which also controls the cost of manufactures of every kind and the cost of building material, food, clothing and every concern of life.

HIGH WAGES PAID MINERS FOR DIGGING COAL

Allow me to cite briefly a few instances of the high prices paid miners for digging coal in the urgency of war conditions. In 1917, in a coal-loading contest, at eleven collieries of the Gary mines in West Virginia, the average earnings of the leading miners in each place was $10.68 per man per day, during the last 13 days of the contest.

In *Coal Age*, Vol. 18, p. 621, it is stated that Joseph Varga, a coal miner, drew $245 for two weeks' pay, after missing one day in that time. On page 1097 of the same volume two miners are reported as drawing jointly $783.34 for two weeks' pay.

These, together with many instances that we could mention of our own observation where miners averaged from $10 to $12 a day, for an entire month, show plainly the high wages that miners have been paid as a result of the war. The effect of this large increase in wages during the past four or five years has developed, among a large class of miners, habits of extravagance and waste.

While a few thoughtful miners have taken advantage of the high wage scale and saved their money, knowing that these high prices could not last always, a large majority have spent all that they earned and now find it difficult to return to their former mode of living.

One miner of my acquaintance has bought and paid for a good home and a few acres of land and has several hundred dollars to his credit in the bank. Although this man could neither read nor write, he showed his wisdom by saving his wages while others were spending theirs in needless extravagances.

In closing, let me say, the present is a time of reconstruction. Industrial and manufacturing enterprises are facing a period that calls for economy in every department. The individual who does not exercise the same forethought and economy, is bound to suffer for his neglect. In the coming days, miners must accept their share of the burden now resting on the country. Deflation is the order of the day and the thoughtless miner will learn lessons in economic living that will be of value to him.

JOHN ROSE,
Former District Mine Inspector.
Dayton, Tenn.

Making Americans Not Easy Task

When should training of the foreigner begin?—Conditions that surround the newcomer bad — Higher standard of admission needed—Foreign element employed in the mines hard to control.

FEW of us realize fully the sad condition we are facing, today, because of the great mass of immigration freely admitted to our shores years ago. From all lands they came, good, bad and indifferent. They crowded into our towns, and, according to their varied degrees of intelligence, learned more or less of what it meant to be Americans.

The question that quickly confronted the thinking portion of our people was, "How can we teach and train these newcomers regarding the principles on which our country is founded and when should this work begin?" We now realize that to wait a couple of years before starting this training is bad. If we are to accomplish anything the work must start at the moment the newcomer reaches our shores.

We have learned by experience that the conditions which surround the foreigner on coming to this country are such that if no systematic effort is made to educate him in American ways and methods he quickly gains wrong ideas, through his own observation and interpretation of his new surroundings.

Much is now being accomplished by the Government, in its treatment of this class of immigrants on their first arrival in the country. In addition to this, there have been formed Americanization classes in many of our mining towns and camps where these foreigners are congregated. Only those who have had this work in hand know of its difficulties.

While a few of the more intelligent of the foreign element have caught the American spirit and become an honor to themselves, their town and our country, a large class are held bound by their prejudices and habits and give little hope of ever making good American citizens.

Years ago, before the immigration laws were amended, many paupers came to this country, who are yet and always will be paupers, living on the sympathy and generosity of others. Such are the large majority of the people living in hospitals and poorhouses everywhere.

HIGHER STANDARD OF IMMIGRATION LAWS NEEDED

What we need is a higher standard of immigration laws—a standard that will eliminate the undesirable and useless class from entering the country. The strict enforcement of such laws would show a vast improvement in one or two decades, in our cities and towns.

Perhaps no industry suffers more from the inrush of the foreign element than that of coal mining. Conditions have been such as to attract to the mines large numbers of these men who can neither speak, read or write the English language. As can well be imagined, they form a class that is difficult to control.

It is no unusual thing for a crowd of these fellows to attend a meeting, get together and vote to carry their point whether right or wrong, with little regard to rules and agreements previously made. There should be a law compelling all foreigners, on coming to this country, to learn to speak, read and write the English language, which should be the universal means of communication in the country.

If it can be said that "The Irish built our railroads," it is equally true that our coal, today, is dug by foreigners from every nation on the face of the globe. S. D. HAINLEY.

Osceola Mills, Pa.

Dust-Proof vs. Ventilated Motors

Need of dust-proof motors on mine locomotives — Artificially ventilated motors collect dust—Other means adapted to reduce heating, in severe service.

KINDLY permit me to register my disagreement with W. A. Clark, after reading his article entitled, "Either An Oversize or a Ventilated Motor Needed for Steady Locomotive Operation," *Coal Age*, Jan. 26, p. 159.

In his first paragraph, Mr. Clark states, "Until recently all motors intended for use on mine locomotives were totally inclosed and the case made as nearly dust-proof as possible, the idea being to protect the commutator, brushes and windings from coal dust. It was thought that such dust had a tendency to cause short-circuits and grounds that would shorten the life of the commutator."

Many of the latest locomotives that I have seen, are equipped with motors of the same type as that described by Mr. Clark, being encased and made as nearly dust-proof as possible whenever the locomotive is desired for use in a coal mine.

The last statement, in the quotation just given, is surprising, intimating as it does that coal dust on the commutator has no tendency to cause short-circuits and grounds that would shorten the life of the commutator. My experience is quite the reverse of this.

TESTING EFFECT OF DUST ON MOTOR

From tests made in actual mining practice, having no reference to laboratory experiments on laboratory equipment, I have found that the fine coal dust that accumulates on the motor when in use in the mine is a serious detriment to the efficiency of the motor.

Add a little oil or grease, from a bearing, to this dust and you have fireworks indeed. The mass is a good conductor of electricity and a short-circuit or ground results, depending on whether it bridges to the core or between commutator bars.

The dust roughens the surface of the commutator and causes sparking, together with a rapid deterioriation, making regrinding or replacement necessary, which means a considerable cost in upkeep of the equipment. Moreover, dirt or dust is detrimental to the insulating material in the slots of the armature and will shorten its life. The experience of operators using these machines will confirm my statement, I dare say, without exception.

VENTILATING A MOTOR PERMITS DUST TO ACCUMULATE

No extended argument is required to prove that dust and dirt do accumulate in an artificially ventilated motor in service in a coal mine. The dust-charged air enters the motor, through relatively small ventilating ducts, at a fairly high-pressure, whether the ventilation is forced or produced by a fan on the motor shaft. Once within the shell, the air expands and its velocity falls, with the result that the dust is no longer carried in suspension in the air, but is deposited on the commutator and other parts of the machine.

The same action is illustrated in any large dust-collecting system where the dust-charged air enters large tanks and expands and the dust is deposited, owing to the loss of velocity in the air. The same principle is observed, also, in the deposit of fine silt, in the delta of the Mississippi River, when the waters from that stream are lost in the Gulf of Mexico.

In the case of a motor, there are numerous dead-air pockets in which the dust will accumulate. A good turbo-generator design requires that the air to ventilate the generator must be washed before passing into the machine. This air is lily-white compared to that in a coal mine.

These references should prove conclusively that artificially ventilated motors are, at the best, a dangerous expedient. An additional disadvantage in the forced-air scheme is the further complication of a not-too-simple machine. The accessibility of the interior parts of the locomotive is lessened, as will appear in the illustration in the article mentioned.

STANDARD OF LOCOMOTIVE HORSEPOWER

Regarding an oversize motor, for use on a locomotive in particularly severe service, let me say there is a definite standard of motor horsepower per ton, in modern haulage-locomotive practice, and the oversize motor is not commonly employed. The simplest way of securing added capacity is to build into the motor more conductive material, so that the heating is not excessive.

Another expedient is to provide sufficient radiating surface to dissipate the heat generated by the resistance, hysteresis, eddy-current, etc., losses. With such a motor, none other than natural ventilation will be needed and there will be no accumulation of dust in the motor if the latter is inclosed and made dust-proof. Mining men fully appreciate that commutator trouble, in a mine locomotive, means loss of production in the mine. CHARLES M. SCHLOSS.

Denver, Col.

Independent Telephone Circuits Safe Mine Practice

Danger when all telephones on a mine circuit are connected — Present custom of jack-box switches not safe—Cut-out switches the only sure safeguard.

FEW of the articles in *Coal Age* possess greater value, in respect to safety at mines, than that of Dever C. Ashmead, *Coal Age*, Feb. 9, p. 242, in which he has drawn attention to the danger of serious accidents occurring through the misunderstanding of telephone messages where there is but one continuous circuit employed, connecting all the stations at the mine.

The article describes a special design of cut-out switch and gives a diagram of independent circuits that can hardly fail to afford a maximum degree of safety, in the transmission of telephone messages between the officers and various stations in and about the mine.

I have been much interested in studying the plan there explained and am impressed, as never before, with the danger that is imminent in the customary arrangement of telephone service at mines. The incidents cited by Mr. Ashmead show how easy it is for a message to be misunderstood and result in a possibly fatal accident.

That such a possibility should be avoided will not be denied by any practical mining man. The article to which I have referred should be read and studied by all mine officials with a view to avoiding such mistakes.

It is true that the customary jack-box switches could be employed in making the necessary connections required by the diagram shown in the article. However, in that arrangement the plugs are generally left in by the last one using the 'phone and the danger is not avoided.

To my mind, the only safe means of avoiding the miscarrying of a message and the terrible results that may follow is to employ such a specially designed cut-out switch as he has mentioned, which will insure independent circuits and afford no opportunity for mistake.

ENGINEER SHOULD NOT BE REQUIRED TO TAKE AND DELIVER MESSAGES

Too often, the mine system is arranged so as to require the hoisting engineer to act as an exchange operator, which is undeniably bad practice, as it takes his mind from his work and invites accidents in hoisting in the shaft or slope. An engineer should never be compelled to take messages and deliver them. His attention must be wholly concentrated on his work.

While independent shaft circuits are safe, it is clear that the plan described by Mr. Ashmead affords a cheaper arrangement, quicker service and, at the same time, maintains independent shaft lines. The arrangement is particularly convenient for firebosses and men employed on night shifts, who could immediately call the hoisting engineer to secure any needed assistance, in case of accident. It is also shown that the arrangement requires fewer telephones to give the same service.

SAFETY INSPECTOR.

Wilkes-Barre, Pa.

Effect of Exhaust System When Removing Gas by Boreholes

Mine pressure below atmospheric pressure when fan is exhausting—May reverse flow of gas in borehole—More air then required to make mine safe.

REFERRING to the question of removing gas, by means of boreholes drilled from the surface, when accumulated on falls, asked in an inquiry, *Coal Age*, Feb. 16, p. 292, and later discussed by Frank Haas, in the issue Mar. 16, p. 453, I agree fully with the reply made by the editor to this inquiry.

As he has explained, the effect of the borehole to remove gas accumulated on a fall will depend much on whether the mine is ventilated by a blowing or an exhaust fan. In the former case, the mine pressure being greater than that of the atmosphere, there is no doubt but that the gas will be forced out through the borehole, which will then be the most effective means of getting rid of the gas in the mine.

On the other hand, as stated in this reply, when the fan is exhausting the mine pressure is below that of the atmosphere and the tendency will then be to suck air down the borehole and drive the gas back into the mine. In that case, if the air current is not sufficient to dilute the gas and carry it away, an explosion may result by its being ignited on the lamps of the miners.

My conclusion is that, while boreholes are effective means of removing gas accumulated on falls, in the blowing system of ventilation, in the use of the exhaust system, there will be required a larger circulation of air, in order to dilute the gas and make the mine safe.

In commenting on this subject, Mr. Haas estimates that a borehole 300 ft. deep will afford a water gage a trifle less than 2 in., owing to the difference in the specific gravity of the gas and air. Based on this calculation, he claims that the gas will pass up the boreholes regardless of whether the fan is blowing or exhausting.

Theory is a good thing, which every mine foreman should understand, but practical experience is necessary also.

Twinton, Tenn. LEE JONES.

[In this connection, it may be said, it is true that a 300-ft. borehole, filled with pure methane undiluted with air, would afford a water gage a trifle less than 2 in., which as the correspondent states was the estimate of Mr. Haas.

But, applying this calculation in practice, let us assume that the exhaust fan ventilating a mine has been shut down for a period, and the gas given off on the falls has completely filled the borehole through which it is escaping under a pressure equivalent to a 2-in. water gage.

We will further assume that the fan being again started gives a pressure, in the fan drift, equivalent to a water-gage of 1½ in. due to the mine resistance. Then, taking the depression, in the workings at the foot of the borehole, as, say the half of this amount, or a water gage of ¾ in., leaves an effective water gage in favor of the borehole of 1¼ in., instead of the previous 2 in.

But, now, what happens? Under this effective gage, the flow through a 6-in. borehole 300 ft. long may be estimated at 72 cu.ft. per min., taking the Atkinson coefficient of friction. If there is this volume of gas being given off, it will fill the borehole and maintain the gage constant. If less gas is generated, however, some air will be drawn into the hole, diluting the gas and still further reducing the effective gage.

Under the assumed conditions, the effective water gage due to the borehole, will be reduced to the depression in the mine due to the fan, when the mixture passing up the borehole is, practically, a 10 per cent mixture, or slightly above the maximum explosive point of the gas. Beyond this point, the depression due to the fan will be greater than that due to the borehole, and the flow will then be reversed.]

Inquiries Of General Interest

Graphic Solution of Algebraic Formula

Well Known Algebraic Formula Demonstrated Graphically—Cube Divided Into Two Smaller Cubes and Six Prisms, Corresponding to the Four Terms of the Formula

PERMIT me to ask for the solution, graphically, of the algebraic formula expressing the cube of the sum of two quantities, which is as follows:

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

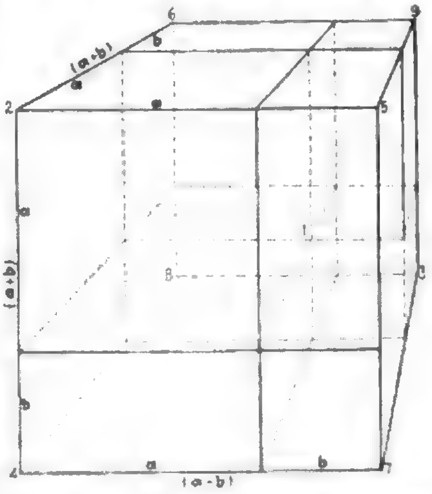
I have always been interested in graphic solutions, but was recently puzzled to represent this formula, by that means. Will *Coal Age* kindly assist me by showing the solution.

Fernie, B. C., Canada. STUDENT.

Analyzing this formula, it is clear that the first member of the equation represents a cube whose edges are each the sum of two quantities a and b, while the second member, consists of four terms representing, respectively, two smaller cubes having edges a and b; three prisms, each having a base a^2 and a height b; and three other prisms, each having a base b^2 and a height a.

The problem, therefore, is to divide the large cube into two smaller cubes and six prisms. Three of these prisms must each have a base corresponding to a side of the larger of the two small cubes; while the three other prisms must each have a base corresponding to a side of the smaller cube. Likewise, the height of the first three prisms must correspond to an edge of the smaller cube, while the height of the other three prisms must be equal to an edge of the larger cube.

Referring to the accompanying figure and designating the several cubes and prisms by the figures indicating the diagonally opposite corners of each, the large cube 2, 3, represents the first



member of the equation, each of its edges being $a + b$.

As shown in the figure, this large cube is divided into two smaller cubes, 1,2 and 1,3. Notice that each of these cubes has three inner faces that form the bases of the six prisms, respectively. Also, all the several cubes and prisms into which the large cube is divided have a common point, marked 1.

Now, referring to the formula, the first term of the second member is represented by the cube 1,2, while the last term is likewise represented by the cube 1,3. Again, the second term of that member is represented by the three prisms 1,4; 1,5; 1.6. Likewise, the third term of the second member of the equation is represented by the three prisms 1,7; 1,8 and 1,9.

Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

QUESTION—*How many different kinds of explosives does the law allow to be used in one drillhole?*

ANSWER—But one kind of explosive must be used in a single drillhole. When two kinds of explosives or two different grades of powder are used in the same hole, there is liability that one will explode before the other and cause a windy or blownout shot, the slower powder expending much of its force in the air.

QUESTION—*Which is the safest explosive to be used in coal mines, black powder, dynamite or permissible powder? Why?*

ANSWER — The permissible powder that is found to be best adapted to the particular coal to be blasted, is the safest explosive to use in blasting coal. The reason is that permissible powders are designed to give less flame when the shot is fired. Also, a less weight of charge of permissible powder will do the same work that a larger charge of black powder will perform. Dynamite can only be used to advantage in blasting rock or coal that is very hard. Black powder produces a large amount of flame, which is projected into the air when the shot is fired.

QUESTION—*If you were employed as a fireboss to examine a mine for the nightshift, before the dayshift had left the mine and their working places, how would you examine the places to comply with the Bituminous Mine Law of Pennsylvania?*

ANSWER—A fireboss cannot properly examine a mine before the men have left their working places and departed from the mine. The Bituminous Mine Law of Pennsylvania requires that the examination shall begin within three hours prior to the appointed time for the men to enter the mine. The law does not provide, in a separate manner, for the examination for the nightshift; but it is assumed that this will take place under the same conditions that pertain to the morning examination for the dayshift. In that case, the hours would have to be so arranged that the fireboss could make his examination between shifts, beginning his work after the last of the dayshift have left the mine and within three hours of the time for the nightshift to enter. Sufficient time would have to be given for the gases and smoke produced in blasting to be swept away, before the fireboss starts his examination.

QUESTION—*How many 1½-in. pipes are required to replace a single 15-in. pipe, the length and head being the same in every case?*

ANSWER—In the flow of water through pipes, the quantity of the flow varies as the square root of the fifth power of the diameter of the pipe, assuming a constant head. Then, let n be the number of smaller pipes required to give the same flow of water under the same head, as the 15-in. pipe, the lengths of all the pipes being the same, and we have

$$n\sqrt{(1.5)^5} = \sqrt{15^5};$$

$$n = \sqrt{\left(\frac{15}{1.5}\right)^5} = \sqrt{10^5} = \sqrt{100,000} = 316$$

That is to say, it will require 316 two-and-one-half-inch pipes to discharge the same quantity of water, under the same head, as a single 15-in. pipe discharges, all the pipes being of equal length.

QUESTION—*If it requires six hours to fill a tank, using a 1½-in. pipe line, how long will it take a 15-in. pipe to fill the same tank, for the same head and length of pipe?*

ANSWER—Since the 15-in. pipe will discharge 316 times the quantity of water delivered by the smaller pipe, under the same head and for the same length of pipe, in order to fill the tank with the larger pipe it will require 1/316 part of the same time. The time required for the 15-in. pipe to fill this tank is, therefore, (6 × 60) ÷ 316 = 1.139 min.; or 1 min. 8.3 sec.

QUESTION—*How many tons of rock will a hemlock prop support if the size of the prop is 3 ft. long and 12 x 12 in., in section?*

ANSWER—Post timber is assumed to present equal resistance to crushing and bending when the diameter of a round post is $\frac{1}{11}$ of its length, or the side of a square post $\frac{1}{12}$ of its length. In other words, a greater relative length than this will cause a post to bend before it will crush and, *vice versa*, a lesser relative length will develop crushing before bending takes place.

In this case, the length is but three times the side of the square section and the strength of the post is therefore determined by its resistance to crushing. This, for hemlock timber of good quality, may be assumed as 5,300 lb. per sq.in. The ultimate crushing load of this post is then, (12 × 12 × 5,300) ÷ 2,000 = 381.6 tons.

QUESTION—*How many props (hemlock) 3 ft. long, 12 x 12 in., in section, will it take to support a section of roof 300 ft. long by 50 ft. wide and, say 50 ft. in height, to insure against a general caving in of the roof?*

ANSWER—Owing to the overarching tendency of the roof, in a place 50 ft. wide, the material to be supported and resting on the post timbers will have a cross-section in the shape of a trapezoid. The vertical height of this trapezoid is 50 ft., its base 50 ft., and the width of the top, say 30 ft., giving a sectional area of 50 × ½(30 + 50) = 2,000 sq.ft. The cubic contents of a prism having this base and being 300 ft. in length is 300 × 2,000 = 600,000 cu.ft.

Now, taking the average weight of roof material in the coal formations, say 160 lb. per cu.ft., the total weight of this overburden resting on the timbers is (160 × 600,000) ÷ 2,000 = 48,000 tons. Then, the crushing weight of a single prop of the given dimensions being 380 tons, we can assume a safe load of, say 160 tons as supported by each post. On this basis, the number of posts required will be 48,000 ÷ 160 = 300 props. This will require six rows of 50 posts in each row, set 6 ft. apart, center to center, the distance between the several rows being 50 ÷ (6 + 1) = 7⅐ ft.

QUESTION—*If a post 3 ft. long, 12 x 12 in., in section, is standing upright supporting roof, at its full carrying capacity, (a) What size of rope hitched near the bottom of the post would be required to pull out the timber? (b) What would be the pressure and horsepower applied to the rope to pull out such a post?*

ANSWER—(a) No practical answer can be given to this question, for the reason that this post, carrying a weight of over 300 tons, its full carrying capacity being estimated at 380 tons, would doubtless be sunk into the bottom, and would offer indefinite resistance to the pull of the rope. Even assuming a hard rock bottom, it is impossible to estimate the sliding friction of the post on the floor of the seam and impossible, therefore, to compute the size of rope required to pull the post.

(b) The same answer applies to this question also.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THAT business is still making progress in its recovery from the memorable depression of 1921 is indicated by figures received since March 20 by the Department of Commerce. Progress in business rehabilitation, according to the department's latest survey, needs to be cautious that it may be built upon a firm foundation. Some backsets may be expected, for all of the lesions caused by post-war overexpansion have not healed.

Although in most lines prices have been relatively stable for the past six months, distributors still remember the disaster caused by overstocked shelves in 1920. Forward orders, therefore, are given sparingly and in reduced volume; however, manufacturers are feeling the effect of repeat orders, and the steadily increasing output of mills and factories shows that fundamentally the country is getting back to normal.

Although the recent marked increase in the price of farm products has had a big effect upon the morale of the agricultural districts, not much of this has so far been translated into increased business. Most of last year's crops had left the farmers' hands before the rise came; the increase is therefore chiefly a promise of better things to come. The farmer is inclined to wait and see both as to whether the price holds and how the crop promises before making further commitments.

The activity of woolen and worsted machinery at the first of March showed a significant improvement over the condition reported at the beginning of the preceding month. The per cent of active machinery hours to the total hours reported increased for every class of machines except worsted spindles. A year ago the per cent of active hours ranged from 30 to 49; last month machine activity ranged from 66 to 97 per cent.

The activity of cotton spindles decreased somewhat, due to the New England strikes. Exports of cotton cloth amounted to 32,707,000 sq.yd., an increase of nearly 1,700,000 yd. over January. Production of knit underwear increased for the month, although shipments and orders fell off. Production in this industry was 84 per cent of normal, compared with 28 per cent in the same month last year.

Exports of iron and steel totaled only 132,000 tons in February, or 25,000 tons less than in January. Part of this drop was due to the shorter month but even this lower figure was larger than for any month between June and December of last year. Sales of structural steel increased over January. Copper exports also decreased slightly, while the imports of tin and zinc increased.

Petroleum production dropped 2,000,000 barrels below the record output in January but, at that, production was greater than for any month in 1920, and was exceeded by only two months in 1921.

Production and shipments of newsprint paper were less in February while stocks increased. Prices also were lower than a month ago and about 40 per cent less than at this time last year.

Final figures on building activity during February have confirmed the preliminary statements. A marked increase occurred in the contracts awarded for business buildings, which were nearly double the amount reported in February last year. The total floor space reported for all classes of buildings in February was 30,061,000 sq.ft., a decrease of less than 1 per cent from the total recorded for the longer month of January.

Iron Output High in March

Output of pig iron in the United States during March, according to the returns of *The Iron Age*, reached 2,034,794 tons, an increase of 404,803 tons over February and of 439,272 over March of 1921. This is the first month since January, 1921, in which production passed the 2,000,000-ton mark. The daily average output for the month was 65,639 tons, which was 7,425 tons a day more than in February and 14,171 tons beyond the output of March, 1921. This average daily output was the largest of any month since February of last year.

Roads to Buy Equipment

The New York Central is negotiating for the purchase of about 19,000 freight cars. The inquiry is one of the largest that has appeared in the equipment market since the war. Many other railroads are asking for bids for the construction of new rolling stock. The number of orders for freight cars for domestic use this year has already exceeded the total for the whole of 1921.

The Philadelphia & Reading management has provided for improvements and betterments during the current year which will necessitate the expenditure of about $15,000,000. New equipment comprises the largest single item and will cost about $7,000,000. An order for twenty-five consolidation freight locomotives has been awarded to the Baldwin Locomotive Works for delivery this year and orders have also been placed for 2,000 steel coal cars and 105 passenger coaches.

Other inquiries now in the market include one from the Chesapeake & Ohio for 7,000 freight cars and another from the Louisville & Nashville for 2,000.

Automobile Output Up in February

Production of automobiles in the United States during February, according to *Automotive Industries*, amounted to 129,500 cars, compared with 90,486 in January, 78,995 in December and 116,349 in November.

Lumber Orders Exceed Mill Output

"The noise of hammer and saw is increasing throughout the country, attended by a slow but sure gain in bookings of orders for lumber," says the *American Lumberman* "Sales, not only by manufacturers to retailers but by retailers to ultimate consumers, are expanding, although the market is not spectacular. Generally speaking, the market remains firm, and there is every indication that the volume of trade will continue to expand. Orders so far booked this year have slightly exceeded production, and shipments have almost equalled production."

Advocates Conciliators in Basic Industries To Avert Industrial Disputes

BEFORE the Senate Appropriations Committee, Secretary of Labor Davis advocated that sufficient funds be provided to enable the detail of special conciliators to basic industries, including mining, in the effort to prevent industrial disputes. The original plan was for thirty specialists in a like number of the basic industries of the country, appointed from among laboring or business men possessing ability and knowledge of the work of the industry to which they would be assigned. In the interest of economy Mr. Davis modified the recommendation to cover four to seven conciliators in order to try out the scheme.

Secretary Davis cited the coal strike as illustrating the need for such a service to industry. "With a coal strike coming on," he said, "if we had a trained conciliator thoroughly familiar with the coal industry he would be the chairman of that particular coal commission, ready to hold sessions in any city, and the same process would follow in other lines of industry." While saying that the present conciliators are jacks of all trades and master of none, Mr. Davis would not dispense with their services, as they were needed in settling disputes, although he admitted they were not conducive to lasting peace in industry. He said the conciliators must be strictly neutral or would not be retained.

Director Kerwin, of the conciliation service, said the conciliators assigned to the basic industries would be high class men technically skilled in the basic industry to which assigned and would obtain information from the standpoint of the manager of the industry as well as the employees. This information would be made available to government, state or municipal agencies, employers and employees to prevent industrial disputes. He said the plan was to assign one conciliator to the mining industry. The conciliators selected would be those who understand the employees' viewpoint He thought the Secretary's plan was necessary to settle industrial disputes, as at the present time the disputes were more difficult to adjust as both sides to the contest foot every stage of the proceedings for their views.

Davis Cites Government Efforts to Induce Soft-Coal Miners and Owners to Confer

IN a statement issued on March 31 Secretary of Labor Davis reviewed the efforts of the government to induce the bituminous coal operators to confer with the miners. In it he stated the government would take no further action except to suppress violence and to prevent advance in coal prices. His statement follows:

> All of the government's efforts in the proffer of mediation, conciliation and compromise have failed to save the country from the national strike test of economic strength between employer and employee in the coal industry.
>
> In this dispute in the coal industry, President Harding and other government agencies, chiefly the Department of Labor, have for weeks counseled this conference provided for in the last joint agreement between the operators and the miners. In this effort the President and myself have had neither legal right nor personal desire to dictate any program. Our one desire has been to induce, by persuasion and urgence, the operators and miners to discharge the obligations they assumed themselves, to confer again for the shaping of a new agreement.
>
> These efforts began in February after the refusal of some of the Central Competitive states operators to meet in accordance with the resolution adopted in March, 1920, providing for a preliminary conference to meet prior to April 1 to arrange a time and place for a meeting to negotiate a new agreement.
>
> I have always believed—and every citizen is with me in the belief—that employers and employees who have signed a wage agreement or contract should observe it in spirit and to the letter. *If the two parties to a trade dispute get together it is always possible to work out a satisfactory settlement and maintain peace.*
>
> In fairness it must be said that the miners' officials were willing and ready to go into the conference agreed upon, but some of the operators declined to meet, alleging that competitive factors and federal grand jury indictments prevented any such favorable outcome as to the continuation of the existing agreements, and hence the "preliminary meeting," would prove unsuccessful. Others said that they were willing to confer, but that unless *all* Central Competitive states operators would attend, such a meeting would be barren of results and futile.
>
> Also several outlying districts with a combined tonnage output much larger than that of the Central Competitive states protest the right of Central Competitive states to fix the basic wage for the bituminous coal industry, not only because of their minority production but because competition of non-union coal affects the said outlying districts more than the said Central Competitive states.
>
> The Competitive states arrangement is not of governmental making nor is it a new experiment. It has been in operation since 1898, and the records disclose the fact that in past years the operators as well as the miners' officials have looked upon it as a fixed and basic agency in the bituminous coal industry.
>
> There may be room for argument on some of these contentions, but they do not efface the main fact, that operators and miners were bound to a conference, that this conference might have led to a new agreement, and the country might not have been confronted with a stoppage of coal production, a suspension avoided, ample supplies of coal, and a gradual reduction in prices would have resulted.
>
> I cannot let the opportunity pass without expressing keen disappointment at the failure of certain operators to fulfill the terms of their obligation to meet in conference with a view to peace in the coal industry for two years more. They have turned their backs on a chance to lay bare not only to the miners but to the public their reasons, at least, for declining a new wage arrangement. The public is entitled to these reasons, and the press would have fairly supplied them. Even though the operators were convinced that it could come to nothing, their entrance into conference would have removed any stigma of a breach of faith.
>
> There may be faults on both sides of this bituminous dispute, but the side that openly repudiates its written and signed obligations has crippled its case before the bar of public opinion.
>
> The anthracite industry presents a pleasing contrast, for its operators and miners are now meeting directly. There may be a suspension, but there is a negotiation and a genuine desire to agree. This clearly illustrates what the government has sought all along in the bituminous field. There is not now, and there never has been, any disposition in Washington to force conditions upon employers or employees. . . .
>
> As the strike in the bituminous industry is inevitable, the industry is squarely on trial before the public. At this stage it is simply an economic dispute in which the chief sufferers will be the operators and miners themselves. During the strike the administration will watch developments and be ready to safeguard the public welfare whenever it is menaced. . . .
>
> *There will be no excuse for advance in coal prices.* If the price is boosted in any locality, the fact should be reported to Washington at once for action by the Attorney General. The public should not be penalized to pay any enhanced price for coal when there is no justification for any increase.

Strike to Compel Miner to Limit Output

A STRIKE was declared on March 2 at Old Forge Colliery, Old Forge, Pa., involving 1,400 men who to March 31 lost approximately $175,000 in wages. The circumstances leading up to this strike were as follows: Alex Pohutsky, a miner, was accused by the grievance committee of the United Mine Workers at this operation with having loaded more than two cars of coal on Feb. 8. The grievance committee investigated the matter and fined Pohutsky $25. He refused to pay the fine.

The grievance committee called on the management on March 3, the men having gone back to work that day, and demanded that Pohutsky pay the fine or be discharged. The management refused to discharge Pohutsky and stated that it had nothing to do with the enforcement of fines which the union levies on those who do more work than the union has seen fit to prescribe. The men again went out on March 4 and the strike has continued without interruption, although this is a case which under the contract should have been referred to the Conciliation Board.

Pohutsky asked to be allowed to work, and in a period of 13 days he and a laborer loaded 48 cars of coal, upon which the total earnings were $428.53, less $11.57 for supplies, making the net earnings of the miner and laborer $416.96. Based on the two-car limit arbitrarily fixed by the union, this miner and laborer during the same period would have loaded only 26 cars of coal and their total net earnings would have been $191.44. The incident shows how the union limits production and indicates what earnings the miners could easily make if they were so disposed.

New York Retailers Warn of Damage Suits If Railroads Confiscate Coal

ACTING on the suggestion of the transportation committee of the National Retail Coal Merchants' Association, the Coal Merchants' Association, Inc., of New York City, has served notice on nearly fifty coal-carrying railroads, in behalf of the retail coal dealers in New York City, that in case of confiscation of coal, the dealers will file claims for special as well as general damages.

Dealers are notified that the Transportation Committee also recommends that they request shippers to place the following notice to carriers on the bill of lading where coal is purchased at the mines: "This coal is shipped for purposes of resale, and to conduct a coal business at destination, and to fill past, present and future contracts with purchasers."

Zeigler Miners Averaged $259.42 Each for "Buster" Month of March

GIVEN a steady-working mine, the men who dig coal in Illinois certainly have had a chance to make a good living under the old scale of wages. Figures on the March production and earnings of every man in Zeigler No. 1 mine of the Bell & Zoller Coal Co., just made public, show that the average production for the entire 27-day month was 277 tons per loader and the average pay check for that month $259.42. The averages for all machinemen for the month were 3,880 tons and $259.42, or exactly the same average pay as loaders got. The swiftest loader put 491 tons on his pit cars and collected $406.04. The swiftest pair of machinemen got credit for 4,630 tons and collected $401.30 each.

This mine was pushed along at full blast during most of the 27 uninterrupted working days of the month, for it was racing Orient No. 1 mine, its neighbor, for the world's championship in production. It raised 164,085 tons, which was about 2,000 tons more than Orient. The employed daily average at the Zeigler mine was 804 men. Thirty-five breast machines were used straight run and eight gang run. Haulage was done with 21 gathering, 6 main-line and 2 bottom-pusher locomotives. The mine was in charge of Superintendents Joseph Yerley and E. L. Berger and Mine Manager Edward Pruden.

The following table shows how many of the mine's 800-odd employees earned more than $300 during the month of March:

	Tons Produced	Earnings
Average per loader	277	$259.42
Melasco Angello	491	406.04
Jno. Holoanich	425	351.49
O. Tymits	394	325.83
Mike Yankoff	391	323.35
Chas. Messina	402	332.54
Chas. Semeaky	390	322.52
Mathew Gasnas	388	320.47
Joe Cape	376	304.64
M. Tadonovich	390	322.52
G. Cockie	403	333.27
Average machineman, each	3,880	$259.42
Adam Sesoch	4,630	401.30
Frank Vuk		401.30
Geo. Hall	4,484	320.60
Mike Kalovinch		320.60
Chas. Koski	4,251	303.94
John Samlakoski		303.94
Rocco Orlevic	4,370	312.45
Tony Ratkovich		312.45
Mike Nickovich	4,263	304.79
Melos Dovich		304.79
Mike Popovich	4,464	319.16
Joe Varrus		319.16

An English View of the Strike

(From an editorial in the *Colliery Guardian* of March 31)

THE strike has a certain interest to us apart from its commercial significance; ostensibly it is an attempt on the part of the miners to resist a cut in wages on the expiry of the old agreement, which takes place today. Really the struggle represents very much more than this, and we are not here referring to the demands for shorter hours, etc., with which the main demand has been reinforced. The crux of the whole position is the refusal of the operators in the various states to meet as components of a national conference. It will be seen, therefore, that the American strike is analogous in some respects to the British stoppage of last year, in which the fundamental issue was the effort of the Miners' Federation of Great Britain, by hook or by crook, to establish a uniform wage rate and a national board for the whole of the British coal fields; the whole basis of their opposition to Part II. of the Mining Industry Act was directed against the establishment, under that act, of area and district boards, which would have revived the obsolescent conciliation boards in operation prior to the introduction of control.

Throughout the negotiations of the past two months the various employers' organizations in the Central Competitive area of the United States, embracing Illinois, Indiana, Ohio and part of Pennsylvania, from which the great bulk of the soft coal output is derived, have intimated their willingness to meet their own workmen with a view to adjusting wages, but they have steadfastly refused, in the face of considerable pressure from the White House, to take part in a general conference. The contention that such a conference is predicated by the terms of the last government award has not moved them from this determination, and here again we see the growing impatience of government coercion, which is a feature of the present attitude of all trading communities that were forced to toe the line during the period of hostilities.

Tipples Spring Up as Illinois Strike Crop

CONSIDERABLE building and revamping of mine top works and machinery is under way in the Illinois coal-mining fields during the shutdown, and indications are more work will be started soon. Just now three new tipples with complete coal preparation plants are building, at least four other companies are replacing shaker screens and loading booms, several shafts are about to be retimbered by miners working under the old wage scale and a great many smaller jobs of overhauling are being begun. No less than four companies are planning to sink new shafts in the state, but none of them is ready to announce those plans yet.

The Searles Coal Co. is tearing down its old tipple at Johnson City, Ill., in order to improve the preparation of the mine's output by the use of new picking tables and loading boom of the latest type in a steel tipple which Allen & Garcia have designed. When the work is done the mine's maximum hoisting capacity will have been raised from 3,000 tons a day to about 3,500 or more. The Ender Coal Co. is among those who are adding equipment to their plants. This company is installing a new loading boom and some other smaller apparatus.

A new tipple at No. 15 mine of the Indiana & Illinois Coal Co., at Taylor Springs, Ill., is to replace an ancient structure which had weakened so under the strain of hoisting a couple of thousand tons a day for these many years that it actually was guyed up by lengths of old hoisting cable. The cables anchored the side of the tipple opposite the engine. This makeshift arrangement served its purpose during a period of considerable mining activity when the company did not want to shut down for repairs and when the cost of construction was considered prohibitive.

The new tipple is an all-steel building of latest design. The plant also is to be equipped with shaker screens and loading boom to facilitate and improve the preparation of the Indiana & Illinois company's output. Whereas the mine has previously turned out only three sizes, hereafter it will make 6-in. lump, 6x3 egg, 3x1¼ nut and screenings either 1¼ or 1½. The new top works and equipment call for an investment of about $40,000 and will increase the possible output of the mine to about 3,500 tons a day. Allen & Garcia are the company's engineers.

The new steel tipple for the Nason Coal Co.'s mine at Virden, Ill., also replaces a historic mine structure. The old tipple was built not many years after the Civil War. Around the old wooden top works of that mine some of the "Virden riots" took place. Construction on the new tipple is starting now. Before the job is complete the company will have spent $50,000 building and equipping a five-track plant designed to turn out 3,500 tons daily in five sizes: Lump, egg, two sizes of nut and screenings. C. C. Wright & Co. are the engineers.

Like all the other Nason mines, the output of this one was greatly increased after the company acquired it. The Virden mine's biggest monthly output under its former owners was 26,735 tons in August, 1918. Its output during the first three months of 1922 was: January, 32,967 tons; February, 35,488 tons; March, 52,304 tons. The new plant at the mine will be ready for service about July 1. As soon thereafter as mining operations get into full stride these production records are scheduled for annihilation.

THE BANDIT INDUSTRY has about reached the point where it is ready for unions and, we hope, strikes. — *Brooklyn Eagle.*

BUSINESS WON'T COME BACK; you'll have to go after it.—*Lincoln Star.*

The First Week of the Coal Strike

EDITORIAL REVIEW

STRANGE as it may seem, the chief interest in the first week of the strike centered not in the coal fields and not in the consuming centers but in Washington, where the union, with the co-operation of the Labor Committee of the House of Representatives, has elected to put its case before the bar of public opinion. No one who has attended the hearings or followed their progress with care can fail to realize the friendly spirit in which the United Mine Workers' witnesses have been welcomed and encouraged. Nevertheless, the coal operators who have appeared have been able to present a very strong case for their position.

The outstanding features of the hearing for the week were the mess that John Lewis got into when he tried to explain his plea for nationalization and the 30-hour week. The effort of Representative Nolan, chairman of the committee, to get a remnant of the Central Competitive Field together resulted in failure and gave the various groups of operators constituting that aggregation a splendid opportunity to restate their position before the public.

T. H. Watkins presented rather a difficult problem to the committee, constituted as it is, when he recited circumstances of contract violations by the union in central Pennsylvania, the ineffectual efforts of the operators to induce the union to open negotiations, and the final fact of a strike with no opportunity whatsoever for the operators to confer with their men. Mr. Watkins asked the committee, in the interest of the settlement which the committee so earnestly desires, to induce the United Mine Workers to permit union miners in central Pennsylvania to begin negotiations with the operators.

Nolan Tries to Get Operators Together

THE invitation of Chairman Nolan, dated April 4, 1922, to the bituminous operators for a conference with the union in Washington April 10, reads:

> Labor Committee, House of Representatives, have been holding hearings on Bland Bill (H. R. 11022) in reference to coal strike. John L. Lewis, president of United Mine Workers of America, in testifying before committee, stated that his organization would meet representatives of operators in Central Competitive Field, exclusive of western Pennsylvania and southern Ohio, if enough tonnage is represented in the meeting to justify negotiations. House Committee on Labor have instructed chairman to notify you of conference to be held in Washington beginning April 10, providing operators agree, for the purpose of meeting the representatives of the Mine Workers organization as the first step in an effort to settle the nationwide coal strike. Kindly wire answer at the earliest possible moment as to whether your association is willing to participate in conference.

The invitation was extended by telegraph by Chairman Nolan to the following: A. A. Augustus, Cambridge Collieries Co., Cleveland; Michael Gallagher, president Pittsburgh Vein Operators Association, Cleveland; W. H. Haskins, secretary Northern Ohio Operators Association, Coshocton; P. H. Penna, secretary Indiana Bituminous Coal Operators Association, Terre Haute; M. L. Gould, president Indiana Bituminous Coal Association, Indianapolis; George M. Jones, president G. M. Jones Collieries Co., Toledo; Rice Miller, secretary Illinois Coal Operators Association, Hillsboro; W. K. Kavanaugh, secretary Illinois Coal Operators Association of the 5th and 9th districts, St. Louis; H. C. Adams, secretary Central Illinois Coal Operators Association, Chicago.

These names had been given to Chairman Nolan by John L. Lewis as operators who might be willing to confer and with whom the union would confer if they represented a substantial tonnage of the Central Competitive Field.

Invitations also were sent to R. K. Gardner, secretary of the Pittsburgh Coal Producers Association, and W. D. McKinney, secretary of the Southern Ohio Coal Exchange, Columbus, who Lewis said would not confer. Mr. Nolan desired, however, to give them an opportunity to be present, if they were willing.

Indiana Agrees to Meet If Entire Field Partakes

THE reply of Indiana was brief and to the point. On April 5 P. H. Penna, secretary of the Indiana Bituminous Coal Operators Association, wired Representative Nolan as follows:

> Members of this association agree to meet miners in interstate conference of Central Competitive Field as previously constituted, but cannot agree to meet with only parts thereof represented. Failing in this, we are prepared to meet our employees in Indiana.

Pittsburgh Vein Operators Reject Invitation

MICHAEL GALLAGHER, president of the Pittsburgh Vein Operators' Association of Ohio, after reciting the events leading up to the present situation and pointing out that "the announced position heretofore taken by Mr. Lewis' organization has been against a meeting other than that of the Central Competitive Field, we now take it from your telegram of April 4 that their position has changed and they are willing to meet exclusive of western Pennsylvania and southern Ohio, which is a departure from their original position," on April 5 notified the committee that:

> We do not consider it to the best interest of the district we represent to meet in the manner which you propose, and therefore are obliged to decline. Nevertheless, in order to still further show our willingness to negotiate a contract with the United Mine Workers of America, we are willing, if the regular four states conference cannot be arranged, to meet with the duly authorized officials of that organization to negotiate a wage scale for our own subdistrict.

Southern Ohio Operators Object to Joint Agreement Under Any Circumstances

W. D. McKINNEY, secretary of the Southern Ohio Coal Exchange, replied, under date of April 6, as follows:

> We acknowledge receipt of your invitation of April 4 to attend a joint conference with representatives of the Central Competitive Field and the United Mine Workers of America and desire to reply as follows:
>
> After more than one year of ardent trial we find our coal public refusing to buy our coal even when produced and offered to them at and below our cost—even when our coal was mined under a much lower scale than the scale now proposed for adoption for the four competitive states by the United Mine Workers of America. The miners of southern Ohio had less than 24 per cent average employment in 1921, with the result that many southern Ohio miners now find it necessary to immediately and publicity apply for food and sustenance. Considering our economic relations with our coal-consuming public and our workmen, we cannot under any circumstances contemplate entering into any joint meeting with the states proposed whose conditions of market and employment are such as to permit them to operate their mines and give their workmen more employment than we can give the miners of southern Ohio.
>
> The facts are that the public interests of this country have grown and grown until they are now too vast and intricate to be settled in a general meeting such as is proposed in four-state conferences. Our local conditions compel us to deal with the conditions of employment of our district, having in mind primarily the interests of the coal-consuming public that takes the product of our mines.
>
> Again, the making of wage agreements through interstate conferences has been challenged in United States courts.
>
> Considering all the circumstances we will not meet in interstate conference with the United Mine Workers of America but are quite ready and willing to at all times meet the representatives of the workmen of this district and negotiate a wage scale and working conditions for the district in harmony with what our coal-consuming public demands of miner and operator.

George M. Jones, president of the Ohio Collieries Co., on April 5 wired representative Nolan as follows:

> Your message received. No doubt you are aware that the operators and miners of the four competitive states have met in joint conference for some years to agree upon a labor scale. Both the operators and miners have been indicted and are being prosecuted by the Attorney General of the United States in the U. S. District Court at Indianapolis for holding these conferences. Until this case is decided it would not be proper for us to attend any more similar conferences. In the meantime we are willing and anxious to meet the United Mine Workers of the State of Ohio to negotiate a new mining scale. Anything that you can do to bring about such a conference will be appreciated.

A. A. Augustus replied as follows for the Cambridge field of Ohio, under date of April 5, 1922:

> Message received regarding proposed meeting with miners April

> 10. We have no association in the Cambridge field and any effort of our own company would not accomplish anything, as we are not a basic district. We hope, however, that arrangements can be made for a four-state conference, as in previous years, at an early date and are willing and anxious to co-operate with you to that end.

Illinois Diplomatically Yields to Voice of Majority in Declining to Meet

THE Illinois operators' reply to Congressman Nolan was really made by the rest of the Central Competitive Field. Every section of the field had previously said "No." This left only Illinois as a possible conferee in an interstate meeting with the miners' International officers. Obviously there was only one answer possible. It was offered with neat diplomacy. It did not put Illinois in the position of balking anybody's conscientious effort to settle the strike. It merely pointed out that the suggested conference had already blown up.

It did raise the question, however, of whether the Labor Committee "is empowered to arrange a conference and to entirely legalize both its negotiations and its final outcome." Illinois, willing as always to meet its own state miners to settle the dispute, does not want to be penalized again as the operators of the land once were for taking part in a government conference with miners.

This was the message signed by presidents of the three associations, wired to Congressman Nolan Thursday, April 6, from Chicago by the three operators' associations at the end of a three-hour session:

> Answering your several telegrams of April 4 suggesting a wage negotiation in Washington April 10 between International officers of the United Mine Workers of America and operators of Illinois, Indiana and some districts of Ohio. The prompt rejection of your suggestion by Indiana and northern Ohio, and before the representatives of the three Illinois operators' associations could secure a meeting, has nullified any possible prospect for the success of your plan because with Pennsylvania and southern Ohio excluded only Illinois remains.
>
> It must be apparent that a small portion of the operators cannot warrantably undertake to negotiate with the national mine union officials for any scale which shall subsequently be taken as a basis for the entire country.
>
> It occurs to us that if your committee shall feel that it is empowered to arrange a conference and to entirely legalize both its negotiations and final outcome, it would seem to be wiser that operators and miners from all parts of the country should be called into such conference.
>
> Under such circumstances it would seem that if such a nationwide conference cannot be arranged to include all the operators and miners of the country, then negotiation by states is distinctly preferable, a policy to which both Illinois operators and Illinois miners are definitely committed as most desirable and as giving promise of quicker results and a fair and economic solution of the nationwide difficulty now confronting the coal industry.
>
> The important issue is not, after all, the form of procedure but the prompt provision of a wage scale in all districts that shall be competitive not only with other mining districts but with other industries as well.

Pittsburgh Producers Recite Legal Obstacles in Rejecting Nolan Proposal

THE center of interest, of course, was the Pittsburgh district, and the reply of the Pittsburgh Coal Producers Association to Representative Nolan's invitation, dated April 6, is reprinted in full as follows:

> Your telegram inviting the Pittsburgh Coal Producers Association to participate in a four-state joint wage conference received. We desire to say that we have definitely and finally determined that we will not again participate in a so-called Central Competitive Field conference. We have already notified the Secretary of Labor of our determination and the reasons therefor.
>
> Does your committee know that at No. 1652 of the United States District Court District of Indiana, 1921, in the case of the United States vs. George M. Jones and others, members of the scale committee from this district who participated in four-state joint conferences held in the past have been indicted for making a four state-wage agreement with the United Mine Workers of America of the kind and character which you are urging us to negotiate? Do you realize that the indictment is still pending? Are you aware that the so-called check-off system, which the United Mine Workers of America still insist shall be imposed upon us as a part of a wage contract, has been charged in that indictment as one of the means by which this alleged conspiracy is carried on? Do you not know that the government in that indictment charges that the officers and agents of the United Mine Workers of America are using the funds derived from this check-off practice to prevent the production of coal in non-union districts and the transportation of coal in interstate commerce.
>
> Do you know that in the case of the Coronado Coal Co. vs. United Mine Workers of America reported in 258, Federal Reporter (page 829), these four-state conferences have already been found to constitute a conspiracy in restraint of trade and commerce in violation of the Sherman law and that the United Mine Workers have been assessed damages in a sum amounting to almost one million dollars?" This case was argued before the Supreme Court of the United States week of March 20, 1922. Do you know that the so-called check-off practice is found in that case to be the method by which the United Mine Workers of America collect enormous sums of money which is used, among other purposes, to destroy the business and property of non-union operators and miners by an unlawful means? In that case a federal jury under a federal judge found that the United Mine Workers in carrying out this four-state conspiracy had absolutely destroyed the mining properties of the companies involved by riot, insurrection and pillage? That case is a public record. Please read it.
>
> Further, we call your attention to the case of Hitchman Coal & Coke Co. vs. Mitchell and others, officers of the United Mine Workers of America, finally decided by the Supreme Court of the United States in 245 U. S. (page 229), where their illegal methods and unlawful course of conduct, including acts of violence, are matters of judicial record.
>
> Again we call your attention to the Borderland Coal case, now pending in the District Court of the United States for the district of Indiana, where on the evidence already submitted the federal judge has found the so-called four-state agreement practice, with the check-off, to be a conspiracy in restraint of trade and commerce.
>
> In the face of these judicial decisions which criticise the legality of the arrangement and which cover its various phases, including the union practices of violence and unlawful acts, we are at a loss to understand how your committee can insist that we continue to participate in this arrangement. If your committee will read the reasons for the position we have taken in refusing to meet the United Mine Workers of America in a four-state joint conference you will find that our representatives were indicted after the resolution which provided for the continuation of the arrangement had been passed.
>
> Are we to take no warning from the decisions of the federal courts but rather continue in this practice which has been condemned? As a further reason for not participating in such a conference as you propose we call your attention to the fact that the miners destroyed this agreement in 1920 which you are now urging us to keep. Their official organ says so (we quote from its issue of Sept. 1, 1920): "The interstate joint wage movement of the miners and operators of the Central Competitive Field, which was in successful existence for so many years, was disrupted at the joint conference held at Cleveland, Ohio." Again: "As a result, the various districts in the Central Competitive Field are working out individual agreements."
>
> We have offered to meet the miners of western Pennsylvania to negotiate a wage for this district; they have absolutely refused to meet us. Can your committee or anyone else charge us with responsibility for this strike in view of these undisputed facts? Why not devote your influence to arranging wage matters in each district in such manner as will not violate the law of the land. We notice in the public press that John L. Lewis, president of the United Mine Workers, has stated that a so-called four-state agreement must first be made and then that agreement forced upon the rest of the United States. Is this fair to the mining districts upon which it is forced, they having no voice in the matter? Does this violate the Sherman law? We have such doubts regarding that procedure that we do not care to be parties to it.

Chairman Nolan of the House Labor Committee, commenting on these responses to his invitation, said, on April 10, the "door is not closed," adding that a few days might bring a change in sentiment, so that a conference might develop. "The answers are not hopeless," he said, "as they show a disposition to get together with the miners in their own states. The situation is rather hopeful."

Northern West Virginia Producers Decline to "Add Complications" to Situation

BELIEVING that participation on the part of northern West Virginia operators would only add complications to any already complicated situation, George S. Brackett, secretary of the Northern West Virginia Coal Operators Association, on behalf of that organization, has declined the invitation extended by the House Committee on Labor to a joint conference, the declination being couched in the following language:

> Following out the request which your committee made when I was before it in Washington on Tuesday of this week, I take pleasure in making the following report:
>
> It does not seem to be the consensus of opinion of representative operators in this field that they could contribute anything to a conference which might be arranged of some groups of the Central Competitive Field. Aside from simply swelling the tonnage represented, there is nothing in common between the problems of our district and the problems of the district of the Central Competitive Field and our representatives probably would just add complications to an already complicated situation.
>
> The conditions in northern West Virginia were rather thoroughly explained by me before your committee and I believe that with a little thought on your part you will agree that nothing could be accomplished by introducing the factors of northern West Virginia into such a conference.

On March 7, 1922, the directors of the Northern West Virginia Coal Operators' Association invited District No. 17, United Mine Workers of America, into conference for the purpose of negotiating a wage scale and working agreement to become effective April 1.

An invitation was sent to C. F. Keeney, president of District No. 17, to meet at Baltimore on March 13. Mr. Keeney accepted and appeared at the meeting, stating that he had no authority, and asked that an adjournment take place until March 25, at which time he would come back to Baltimore to meet with the operators with authority to negotiate and conclude a scale. He advised the operators that his district convention was to meet at Charleston March 21, and that this convention would appoint a scale committee with authority to act and that he would obtain authority from the International policy board at its meeting in Cleveland on the 24th. To all of these requests the operators agreed, and returned to Baltimore on March 25 prepared to negotiate and sign a scale with an agreement for working conditions.

The meeting convened as arranged, on March 25 in Baltimore. Mr. Keeney was asked if he was "prepared to negotiate and sign a wage agreement for the field of northern West Virginia, beginning April 1." According to George Brackett, secretary of the operators association, Mr. Keeney replied: "Mr. Chairman and gentlemen, I am unauthorized to negotiate and conclude a contract at this time." Mr. Keeney also made further statements with reference to why he did not have authority, and after his speech International Representative Moore made a statement to the same affect, and the meeting adjourned.

Mr. Brackett points out that the district union officials are without authority to negotiate and that this has been and still is the sole obstacle to a peaceful settlement in northern West Virginia. The scale committee of the operators from the start has been authorized to conduct such negotiations.

Labor Committee Concludes Hearing

THE past week marked a flood of argument by both operators and miners in support of their position in testimony before the House Committee of Labor. Operators charged the union with attempts to unionize the coal fields of the country, thereby to assume control of the industry, while the unions retaliated with charges of unfair practices on the part of the coal operators.

On Monday, April 10, the Labor Committee concluded its hearing, at least for the present.

Representative Nolan, chairman of the committee, was inclined to the union view that the public would get no benefit from reduced coal miners' wages, pointing out that the Interstate Commerce Commission had declined to give to shippers and consumers the benefit of reduced transportation charges following reduction of railroad wages by the Railroad Labor Board.

On the other hand Representative Black, of Texas, argued that as there had been a decline in wages and costs in the steel and other industries, there must be a deflation in wages and costs in the coal industry. He insisted that there could not be a full restoration of employment in the coal industry unless "there is a reduction in the production costs." He thought the question of overdevelopment of the industry was an incidental question.

Watkins Recounts Efforts of Central Pennsylvania Operators to Meet Miners

T. H. WATKINS, president of the Pennsylvania Coal & Coke Corporation, appeared April 6 on behalf of the Central Coal Association and the Association of Bituminous Coal Operators of Central Pennsylvania, whose 43,000 union employees are now on strike. Mr. Watkins was a member of the commission appointed by President Roosevelt to settle the great anthracite strike of 1902.

"Our object in asking for a hearing before this committee," said Mr. Watkins, "is to co-operate with it in bringing to light the reasons why our 43,000 employees were ordered to strike on April 1 without presenting to us a single demand or grievance and in violation of the thirty-day clause in our agreement."

Mr. Watkins then handed to the committee correspondence and public notices showing that the operators of central Pennsylvania had made earnest and repeated efforts, beginning twelve months ago, to meet the miners' leaders in their district, and that all their efforts had been repulsed under the direction of the union's national officers in Indianapolis.

"If this committee will exercise its prerogative to find out why the union has forbidden its leaders in Pennsylvania to meet us, when the obligation to meet is expressed in our expiring contract," suggested Mr. Watkins, "I believe they can expose the real causes at the bottom of this strike."

In connection with the refusal of the Pittsburgh and Ohio operators to enter the Central Field conference, Mr. Watkins said: "The smoke screen of accusation against Pittsburgh and Ohio operators is familiar union strategy. Behind it the United Mine Workers have violated their agreements or called out their men in every other state where the union is recognized." Mr. Watkins then expressed the opinion that Mr. Davis had been unfair to the operators by failing to give publicity to their protests against the violation of contracts by the United Mine Workers, who were obligated to negotiate for a renewal of the district agreements.

"It is evident," explained Mr. Watkins, "that the Pittsburgh and Ohio operators could not join a conference whose participants are already under indictment in the federal court on charges of conspiracy for having been party to the contract negotiated at the previous conference. The Attorney General has not the power to quash these indictments; this can only be done by the courts."

Both on Nov. 1, 1919, and April 1, 1922, the employees of the operators in Central Pennsylvania were called out on national strikes, and the only reason known to Mr. Watkins and his associates was that the miners' national officials could not come to terms with the Middle Western mine owners. "The system was intolerable and obsolete," he said. "It was like trying to fit a suit for a 10-year-old on a 35-year-old man."

Evidence was submitted by Mr. Watkins showing that at a colliery working 153 eight-hour days for the entire year, the average earnings were $1,618, the spread being from $700 for the lower earner to $3,200 for the high earner.

In commenting on the present demands of the miners, Mr. Watkins called the attention of the committee to the fact that the demand for a six-hour day and a five-day week actually meant thirty hours' work for forty-eight hours' pay, or an increase of 60 per cent in the rate of day men, bringing it to $1.50 per hour. He estimated this would increase the nation's coal bill by $210,000,000 per annum.

As to the operators' position, Mr. Watkins said that it would be financial suicide for them to enter into any agreements which were not based on the mining and market conditions in each district, and it is their hope that this position will soon be recognized as reasonable.

The operators of central Pennsylvania have decided to discontinue the practice of collecting union dues from the pay envelopes of their employees. This favor to the union has been abused through the unlawful uses and coercive methods which these funds have enabled the union to practice.

"No effort has been made or contemplated," concluded Mr. Watkins, "to destroy the union organization in Pennsylvania. Personally, I prefer to bargain collectively with a proper and responsible organization, and the operators for whom I speak have practised this principle for the past twenty-two years."

Mr. Watkins stated that the operators had nothing to fear from an investigation of the situation, and would welcome an opportunity to lay the facts before the public.

BROPHY RECOMMENDS COAL COMMISSION

John Brophy, president of District No. 2 (Clearfield), U.M.W.A., was the witness on Friday, April 7. He recommended a coal commission of five operators, five miners and two disinterested chairmen, to adjust the present situation. He thought that this should be followed by a permanent fact-finding commission, preferably the Federal Trade Commission. He thought the commission should not only discover and publish facts but that it might regulate opening new mines, coal storage and the sale of coal by brokers and commission men.

Mr. Brophy's testimony was largely an elucidation of his philosophy of regulation, as laid down in the "miners' program" which he published for dissemination in his district. This was later published in Mr. Kennedy's *Panther Creek News* for use in the anthracite field. Mr. Brophy was interrogated by Representative Black, of Texas, who could not see why the coal industry should escape deflation when agriculture, steel and other lines have had to take their reductions.

Penna Shows Change in Union Policy

PHIL H. PENNA, secretary of the Indiana Coal Operators Association, who was president of the mine union from 1884 to 1896, in testimony before the House Committee on Labor on Saturday, April 8, contrasted the attitude of the mine union then with its position at the present time. Then, he said, the union observed contracts and enforced obedience by local unions, but now the unions had no regard for contracts and were not subject to control by the national union.

When Mr. Penna referred to the numerous strikes during the last wage agreement, Chairman Nolan admitted they "were troublesome and not right" but urged that the operators and unions get together and "arrive at a new agreement and seek a method to avoid intermittent strikes." Mr. Penna said that whereas years ago the miners observed contracts, the attitude of the men now seemed to be one of "to hell with the operators," they lacking loyalty to the union and to contracts.

Mr. Penna pointed out that the Indiana operators had been willing to meet with the union this year and had in fact accepted the union invitation to confer before it was extended and had selected its representatives to confer with the union. This was done following a conference Mr. Penna had with John Lewis when Lewis suggested Jan. 6 for a conference at Pittsburgh, which, however, was never held, the union not inviting the conference, as was its custom.

Union Successfully Invades Connellsville

CATCHING the operators unawares the United Mine Workers' invasion of the non-union districts of Pennsylvania so far has attained marked success. The Steel Corporation properties, that is the mines and coke works of the H. C. Frick Co., in the Connellsville region have been seriously affected. Just two mines were struck, then four. By the end of the first week the number had increased to 8 and on Monday, April 10, was 12. The situation this week in Connellsville may be summarized as bad, with the Klondike region practically closed and the disaffection spreading to the old Connellsville Basin.

The Westmoreland, Latrobe, Greensburg and Ligonier fields are affected less than Connellsville, but are not free from shutdowns. Each day the area of influence of the union is extended, although in some instances miners have gone back and mines resumed operation after a week's idleness.

Winding Gulf Operators Obtain Injunction to Restrain Union Organizers

A MORE determined effort is being made by the United Mine Workers to invade the ranks of the non-union workers in West Virginia than was the case during the strike of 1919. This has been possible because of the present poor demand for coal and the difficulty of giving and assuring miners regular employment. The New River field is closed down and the Winding Gulf field is working. The only mines affected in the Winding Gulf region are those adjacent to the strongly organized portion of the New River field and in places where the radical elements predominate.

Action was taken by operators of the Winding Gulf field on Saturday night, April 8, to prevent further attempts on the part of the United Mine Workers to organize this field, when, upon the petition of fifty-eight operators Judge George W. McClintic, judge of the U. S. Court of the Southern District of West Virginia, issued a temporary injunction and restraining order against the officials of the United Mine Workers, the effect of which is to restrain them from further activities in this particular non-union field. International officers of the United Mine Workers as well as all officers and members of District 17 and District 29 come within the purview of the order. The injunction was issued by Judge McClintic at ten o'clock on the night of the eighth.

Inasmuch as the injunction is a temporary one, the question of making it permanent will be argued before Judge McClintic at 10 a.m., April 17. Under the terms of the injunction the defendants are enjoined and restrained from doing any act or thing that will suppress or unduly limit the rights of the plaintiffs to employ non-union labor. The injunction also inhibits the defendants from making any further efforts that will tend to create a monopoly of mine labor for the purpose of unreasonably increasing wages or the price of labor above what it should be under normal conditions.

Georges Creek Tie-Up Complete; Sixteen Upper Potomac Mines Operate

THERE appears to be a division in the upper Potomac and Georges Creek regions among the operators as to whether they want any more conferences with the miners, and if so whether the operators or the miners shall seek such a conference. One element among the operators has gone so far as to request further conferences, but another element is opposed to such a movement and insists that if any overtures are to be made they must come from the miners. The agreement under which the mines were operated prior to March 31 in the upper Potomac and Georges Creek territory was not an agreement between an operators' association on the one hand and the United Mine Workers on the other but between the operators and the miners, although the agreement had the sanction of the United Mine Workers organization of District 16. When the miners ceased work on April 1 it was asserted by operators that they had been guilty of a breach of contract because of a clause in the working agreement which provided for a continuance of operations for 90 days after the agreement expired, pending negotiations, in the event that no agreement had been reached before March 31.

The strikers have succeeded in closing down practically all the Georges Creek mines but have not been so successful along the Western Maryland in the upper Potomac field, where the union has not such a strong hold on the miners as it has in the Georges Creek territory. In the upper Potomac region sixteen or more mines operated the first week of April despite the strike and despite the difficulty in finding a market for the coal which is being produced.

Colorado 65 Per Cent Tied Up by Strike

COLORADO is experiencing a 65-per cent tie-up of the coal industry in the northern lignite fields and a like cessation of operations in southern bituminous districts with the exception of the Colorado Fuel & Iron Co.'s mines. About 6,000 men are reported by the union as idle. In the mines of the Colorado Fuel & Iron Co., however, there was an average of 3,346 men working in February, and latest reports indicate 2,645 men at work after the strike was called.

The Victor-American Fuel Co., another large operator, is not attempting to operate its mines in the bituminous field, but the Oakdale mine of the Oakdale Fuel Co. and other properties are working. The Puritan and Columbine mines are operating with small forces in the northern lignite field. In the lignite district at Colorado Springs, the largest mine —the Pike View—is operating.

Miners in the Fremont County district tried to prevail upon company officials to guarantee a continuance of present wages for a definite time as the condition upon which they were to return to work. The Colorado Fuel & Iron Co. declined to consider this proposal, but posted notices that no wage cut would be made without a conference first between representatives of both sides.

Supreme Court Dismisses Lambert Run Suit for Want of Jurisdiction

IN an opinion read by Justice Brandeis, the U. S. Supreme Court on Monday, April 10, dismissed without prejudice for want of jurisdiction the suit of the Lambert Run Coal Co. attacking the method of distribution of coal cars to mines by the Baltimore & Ohio Railroad Co. The court held that as the government was a party to such actions, in that car distribution was under the jurisdiction of the Interstate Commerce Commission, suits of this character should be initiated in district courts of appropriate jurisdiction instead of in state courts, as in this case.

The coal company sought an injunction in the state courts of West Virginia to restrain the railroad in distributing, during times of coal-car shortage, cars on its road in accordance with rules established by the railroad, which the coal company alleged violated paragraph 12 of section 1 of the Transportation Act. The railroad moved the case to the U. S. District Court for the Northern District of West Virginia. The railroad defended its rules on the ground that they had been prescribed by the Interstate Commerce Commission.

In the District Court the motion of the railroad to dismiss the case was denied and an injunction issued against the railroad. The Circuit Court of Appeals, Fourth Circuit, in reversing the District Court and dismissing the coal company's suit said the Interstate Commerce Commission had authority to issue the order regarding distribution of cars under paragraph 15, section 1. The Supreme Court in affirming the Circuit Court's decision, says the decree of the District Court should have been dismissed for want of jurisdiction without prejudice because the District Court was without jurisdiction, the case having originated in a state and not a federal jurisdiction, as required, because the government should be a party to such action.

Miners' Strike Not Important in Utah Yet

ATTORNEY GENERAL DAUGHERTY arrived in is not affected by the miners' strike, seven operations are hit. They are all in the Spring Canyon district and include the Carbon, Liberty, Standard, Spring Canyon, Peerless, Scofield and Kinney. They are practically closed down, only 150 men having returned to work during the first week of the strike.

The U. S. Fuel, Utah Fuel and the Independent, the state's three largest concerns—producing upward of 80 per cent of Utah's total output—are not affected at this writing, although agitators are trying to get their men to stop work.

Daugherty Confers with Judge Anderson

ATTORNEY GENERAL DAUGHERTY arrived in Indianapolis at noon, Monday, April 10. He went immediately to his hotel and declined to be interviewed, saying he would have nothing to say about the purpose of his visit until he had completed his mission. Officials at headquarters of the United Mine Workers knew nothing of his coming. None of those interested either in the strike or the coal conspiracy cases was called into conference with the exception of Judge Anderson. After conferring with the Judge Mr. Daugherty said no action would be taken now toward dismissal of the conspiracy indictments.

The letter of Attorney General Daugherty to Representative Bland, dated April 6, promising immunity from prosecution for a wage conference, follows:

> I have your letter of this date making inquiry of me as to the attitude of the Department of Justice with respect to a conference between the operators and the miners of the Central Competitive Field.
>
> I beg to advise you that indictments were found in the Indiana Federal Court against a large number of operators and a large number of miners for things charged to have been done by them at meetings where conferences similar to those now proposed took place. These indictments were found prior to the time of my assuming the office of Attorney General of the U. S. Some of those indicted were residents of states other than the State of Indiana. In practically all of the states outside of Indiana certain defendants resisted removal proceedings, and these removal proceedings are still pending.
>
> While the Department of Justice has not been officially asked by anybody to state the position of the department in regard to these indictments, or in regard to seeking other indictments in case such a meeting as has been under discussion recently should be held. I have, in public statements and private conversation, very frankly stated that, considering the agreement two years ago between the miners and operators in this particular field, and it may be said, the government's participating in that agreement, a meeting should be held prior to the 31st day of March, 1922. I felt it the duty of the operators and miners to hold such a meeting. Both sides have known all along (informally) that it was my judgment that a meeting should be held, because of the peculiar situation with reference to the meeting which had previously been held, which provided upon adjournment for a subsequent meeting, and to which agreement the government was more or less a party.
>
> Now, having taken that position, is it likely that the Department of Justice would undertake a prosecution against men for doing a thing which it advised under the circumstances should be done? Nobody connected with this department has made any statement to the effect that a prosecution would be undertaken if a meeting such as was contemplated by the resolution providing for the same were to be held. The question as to fear of the government's action was never, to my knowledge, raised until the recent refusal of the operators to hold such a meeting. To my knowledge the question was not raised when the operators, some months ago, were willing at least, if they did not urge, that a meeting should be held, at which time, as I am advised, the miners refused or gave reasons whey they could not meet.
>
> I believe I have given you the facts as they exist, and I believe they will not be contradicted.

Edge Favorably Reports Resolution to Investigate Trade Association Rights

SENATOR EDGE, of New Jersey, has favorably reported from the Senate Committee on Commerce to the Senate his resolution providing for the appointment of a Congressional commission consisting of three members each of the Senate and House to investigate and report on the rights and limitations of trade associations. The resolution proposes that the commission shall investigate existing conditions of industry and commerce for the purpose of recommending legislation defining the rights and limitations of co-operative organizations as distinguished from illegal combinations in restraint of trade. The resolution has been referred to the Senate Committee on Audit and Control of Contingent Expenses for report as to whether the investigation shall be undertaken, as is the usual procedure in investigations involving expenditures. If favorably reported by this committee the resolution will then be subject to Senate consideration.

Anthracite Operators Begin Presentation of Their Case; Warriner Issues Statement

NEGOTIATIONS between the United Mine Workers and the anthracite operators in the week ended April 8 brought to a conclusion the preliminary presentation by the miners of the statistical data supporting their demands.

The sessions this week began on Tuesday with the operators presenting their side of the case and answering the demands of the United Mine Workers.

Following are extracts from a statement issued by Samuel D. Warriner on Sunday, April 9:

"The anthracite miners having completed the submission of their case in the conferences with operators which have been held almost constantly since March 15, the representatives of the operators will begin on Tuesday to present counter arguments and facts with regard to the miners' nineteen demands. These demands would all result in less production and more compensation.

"Throughout these conferences the miners' representatives have insisted upon literal compliance with their demands, without abatement or modification. We are, nevertheless, hopeful that a settlement can be brought about in spite of the fact that all of our employees have been called out of the mines regardless of the pending negotiations with their representatives.

"An analysis shows that to grant the demands of the miners would add approximately $170,000,000 to the annual cost of producing anthracite. As this increase would necessarily be borne by the 53,000,000 tons of the domestic sizes, the increase in the mine cost would amount to more than $3 a ton. This added cost would be paid by the consumer who, so far from being willing to pay present or increased prices, is rightly demanding that the price of anthracite be reduced."

Production and the Market

Weekly Review

AT THE beginning of the second week of the strike the market strengthened materially in the East and only slightly in the West. Demand at Hampton Roads for southern West Virginia non-union low-volatile coal as reported on the Tidewater market has not materially changed. Pool 1 coal is offered as low as $4.60 with quotations up to $4.80, f.o.b. Hampton Roads.

In Western markets, such as Cincinnati and Chicago, smokeless-coal quotations are going up much faster. Pocahontas mine run in Chicago ranges $2.30@$2.50 per net ton, f.o.b. mines, which is a dollar increase in one week.

Baltimore non-union coal is in easy supply with union coal yet on tracks, but in diminishing amount. Byproduct coke plants are in the market for southern West Virginia and eastern Kentucky high-volatile coals to replace Connellsville, cut off by strike. A Buffalo coke plant is reported buying Kentucky coal for shipment by rail to Toledo, thence by Lake to Buffalo.

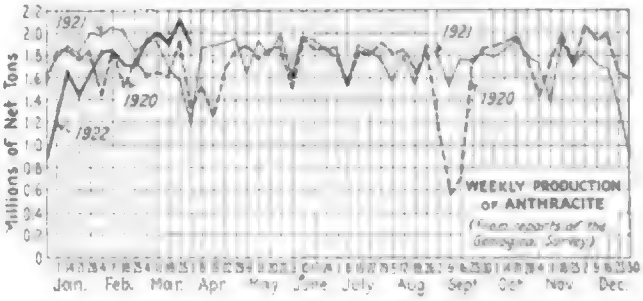
NON-UNION SUSPENSIONS BOOST PRICES

In Pennsylvania, where non-union output has been seriously curtailed by the spread of the strike, the market has taken a sharp upward turn. There is very little coal on track and buying orders exceed tonnage available. Grades of steam coal have lost their individuality and Connellsville steam of any grade commands $2@$2.25. In the Pittsburgh territory free coal has practically disappeared and what production is coming forth is being applied on contract.

Demand in New York Harbor is picking up but in New England it is dull. Screenings prices on the Chicago market strengthened both on local and Eastern coal the first of this week despite the large supply on hand. Steam demand exceeds the domestic demand and lump is being crushed to meet the call for screenings.

Coal Age Index of bituminous spot prices at the mines jumped sharply from 171 on April 3 to 181 on April 10, practically every coal carrying an increase.

Anthracite production held good until the strike set in. There was no stimulation to independent prices but coal moved easily. The companies have picked up their storage supplies of domestic sizes, except pea, and interest now centers on the steam tonnage stored at the mines. Barley is moving the best of the steam sizes. Independents are out of coal and no prices are quoted.

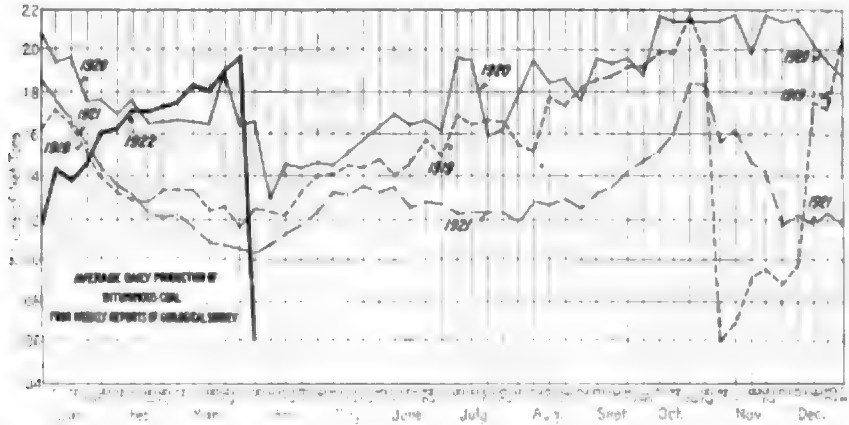


The coke industry is affected by the strikes in the Connellsville region but there has been no bidding up of the market. Where contract shipments have been interfered with, furnaces have been banked. No supply is matched with no demand.

BITUMINOUS

Production of bituminous coal dropped 100,000 tons to 10,453,000 net tons during the week preceding the strike, because of the decline on Saturday, April 1. Daily production for the 5-day week was heavy, however—1,961,000 tons, as compared with 1,910,000 in the previous week. During the first week of the strike the output dropped to approximately 3,500,000 tons, 82,000 tons less than were mined in the opening week of the strike in 1919. The output fell short of what the mines not affected by the strike can produce if the demand is active.

Record production during March removes all reasonable doubt that at least 63,000,000 tons of coal were in consumers' hands on April 1, as forecast by the Geological



Estimates of Production

(Net Tons)

BITUMINOUS		
Week ended:	1922	1921
Mar. 18 (b)	10,843,000	6,512,000
Mar. 25 (b)	11,458,000	6,457,000
April 1 (a)	10,453,000	5,822,000
Daily average	1,961,000	1,059,000
Calendar year	129,282,000	100,704,000
Daily av. cal. year	1,690,000	1,317,000
ANTHRACITE		
March 25	2,095,000	1,564,000
April 1 (a)	1,896,000	1,157,000
Coal year	87,159,000	69,879,000
COKE		
March 25 (b)	175,000	93,000
April 1 (a)	191,000	81,000
Calendar year	1,808,000	2,548,000

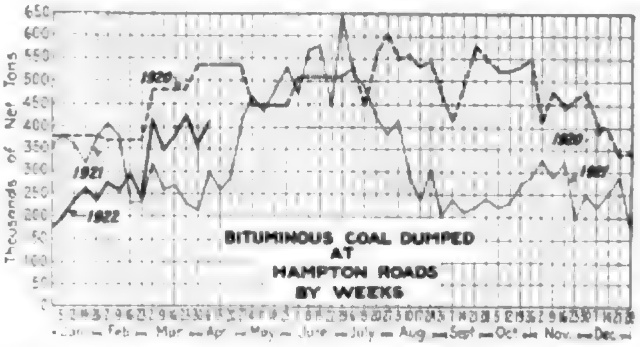
(a) Subject to revision. (b) Revised from last report.

Survey. These stocks are sufficient to last 52 days and will be further augmented by a smaller amount stored at the mines and a heavy tonnage of unbilled coal on hand when the strike set in. Much of this tonnage is of the lump variety for which there is an extremely sluggish market. Many operators are crushing this coal to fill steam orders in hand.

ESTIMATED PRODUCTION OF BITUMINOUS COAL IN MARCH AND DURING THE LAST NINE COAL YEARS

Coal Year	March Production (Net Tons)	Cumulative Production April 1—March 31 (Net Tons)
1913-14	45,455,000	482,685,000
1914-15	31,801,000	399,902,000
1915-16	43,829,000	479,919,000
1916-17	47,869,000	504,134,000
1917-18	48,113,000	548,717,000
1918-19	33,719,000	552,041,000
1919-20	46,832,000	486,993,000
1920-21	30,392,000	522,374,000
1921-22	50,193,000	434,279,000

At the Lower Lake ports there are 40 boats under load, awaiting favorable weather to open the season of navigation. April 15 is expected to see some of these on the way but only a limited tonnage is expected to move before May 1. Receipts at Lake Erie ports have been reduced, of course, by the strike, although non-union shippers are active. Northwestern consumers are dispassionately viewing the strike, secure in their immunity from any shortage by dock stocks—both hard and soft—adequate to last well into the summer. However, dock prices are firmly held in the face of "no markets" as sellers see no reason to sacrifice coal that may be a boon if the strike is a prolonged one.



Hampton Roads dumpings for all accounts rose to 411,252 net tons during the week ended April 6, as compared with 358,084 in the preceding week.

All-rail movement to New England, during the week preceding the strike varied little from recent weeks—3,118 cars as compared with 3,369 in the previous week. That market is as sluggish as ever for Pennsylvania coals and

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

	Market Quoted	Mar 13, 1922	Mar 27, 1922	Apr 3, 1922	Apr 10, 1922†
Low-Volatile, Eastern					
Pocahontas lump	Columbus	$3.15	$2.75	$2.95	*$2.75@$3.00*
Pocahontas mine run	Columbus	1.85	1.75	1.85	**2.00@2.25**
Pocahontas screenings	Columbus	1.45	1.25	1.15	**1.20@1.50**
Pocahontas lump	Chicago	3.15	2.70	2.60	*2.35@2.60*
Pocahontas mine run	Chicago	1.85	1.35	1.35	**2.30@2.50**
Pocahontas lump	Cincinnati	3.15	2.75	2.90	*2.[illegible]@2.75*
Pocahontas mine run	Cincinnati	1.75	[illegible]	1.75	**1.75@2.00**
Pocahontas screenings	Cincinnati	1.15	1.15	1.25	**1.50@1.75**
*Smokeless mine run	Boston	4.60	4.55	4.55	**4.[illegible]@4.70**
Clearfield mine run	Boston	1.95	1.95	1.95	**1.65@2.40**
Cambria mine run	Boston	2.45	2.45	2.45	*2.10@2.60*
Somerset mine run	Boston	1.90	1.90	1.90	**1.70@2.50**
Pool 1 (Navy Standard)	New York	2.95	2.85	2.85	*2.65@3.00*
Pool 1 (Navy Standard)	Philadelphia	3.05	2.80	2.80	2.65@3.00
Pool 1 (Navy Standard)	Baltimore	2.65	2.65	2.70	2.65@2.75
Pool 9 (Super. Low Vol.)	New York	2.40	2.25	2.25	**2.25@2.50**
Pool 9 (Super. Low Vol.)	Philadelphia	2.45	2.15	2.15	**2.10@2.50**
Pool 9 (Super. Low Vol.)	Baltimore	2.15	2.25	2.30	**2.50**
Pool 10 (H. Gr. Low Vol.)	New York	2.00	2.10	2.00	*1.85@2.10*
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.10	1.90	1.90	**1.90@2.10**
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.10	2.15	2.20	**2.25**
Pool 11 (Low Vol.)	New York	1.70	1.80	1.80	*1.65@1.85*
Pool 11 (Low Vol.)	Philadelphia	1.75	1.70	1.75	1.60@1.90
Pool 11 (Low Vol.)	Baltimore	2.05	2.05	2.10	**2.10@2.15**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.60	1.55	1.60	**1.60@1.75**
Pool 54-64 (Gas and St.)	Philadelphia	1.50	1.40	1.50	**1.50@1.60**
Pool 54-64 (Gas and St.)	Baltimore	1.55	1.55	1.60	**1.60@1.80**
Pittsburgh sc'd. Gas	Pittsburgh	2.70	2.65	2.65	
Pittsburgh mine run (St.)	Pittsburgh	2.15	1.85	1.85	
Pittsburgh slack (Gas)	Pittsburgh	1.65	1.55	1.55	
Kanawha lump	Columbus	2.[illegible]	2.30	2.35	2.25@2.45
Kanawha mine run	Columbus	1.60	[illegible]	1.45	**1.40@1.65**
Kanawha screenings	Columbus	1.40	1.35	1.35	**1.35@1.50**
W. Va. Splint lump	Cincinnati	2.50	2.15	2.15	*2.00*
W. Va. Gas lump	Cincinnati	2.15	1.95	2.10	*1.75*
W. Va. mine run	Cincinnati	1.35	1.35	1.45	**1.50@1.60**
W. Va. screenings	Cincinnati	1.30	1.30	1.30	**1.35@1.45**
Hocking lump	Columbus	2.60	2.55	2.55	
Hocking mine run	Columbus	1.90	1.75	1.75	
Hocking screenings	Columbus	$1.50	$1.45	$1.55	
Pitts. No. 8 lump	Cleveland	3.05	2.80	2.75	*$2.75@$3.00*
Pitts. No. 8 mine run	Cleveland	1.90	1.85	1.80	1.75@1.85
Pitts. No. 8 screenings	Cleveland	1.75	1.70	1.65	**1.80@1.90**
Midwest					
Franklin, Ill. lump	Chicago	3.45	3.25	3.35	**3.25@3.65**
Franklin, Ill. mine run	Chicago	2.50	2.25	2.40	**2.50@3.00**
Franklin, Ill., screenings	Chicago	1.85	2.00	2.05	**2.50@2.75**
Central, Ill., lump	Chicago	2.80	2.60	2.60	2.50@2.75
Central, Ill. mine run	Chicago	2.35	2.25	2.25	**2.50@2.75**
Central, Ill., screenings	Chicago	1.75	1.85	1.85	1.75@2.00
Ind. 4th Vein lump	Chicago	3.25	3.15	3.15	3.00@3.25
Ind. 4th Vein mine run	Chicago	2.40	2.35	2.35	**2.40@2.50**
Ind. 4th Vein screenings	Chicago	2.15	2.15	2.15	*1.90@2.10*
Ind. 5th Vein lump	Chicago	2.80	2.85	2.60	2.50@2.75
Ind. 5th Vein mine run	Chicago	2.35	2.20	2.20	**2.50@2.75**
Ind. 5th Vein screenings	Chicago	1.60	1.75	1.75	**2.10@2.25**
Standard lump	St. Louis	2.60	2.45	2.65	2.50@2.75
Standard mine run	St. Louis	1.85	1.85	1.80	**1.85@1.95**
Standard screenings	St. Louis	1.20	1.35	1.45	**1.60@1.80**
West. Ky. lump	Louisville	2.45	2.35	2.35	**2.25@2.60**
West. Ky. mine run	Louisville	1.85	1.75	1.85	**1.80@2.00**
West. Ky. screenings	Louisville	1.65	1.60	1.70	**1.75@2.00**
South and Southwest					
Big Seam lump	Birmingham	2.60	2.10	2.00	2.00
Big Seam mine run	Birmingham	1.85	1.85	1.70	1.50@1.90
Big Seam (washed)	Birmingham	1.85	1.85	1.85	1.75@2.00
S. E. Ky. lump	Louisville	2.35	2.10	2.25	2.00@2.40
S. E. Ky. mine run	Louisville	1.50	1.55	1.55	**1.65@1.70**
S. E. Ky. screenings	Louisville	1.35	1.40	1.40	**1.35@1.60**
S. E. Ky. lump	Cincinnati	2.25	2.10	2.10	*1.75@2.10*
S. E. Ky. mine run	Cincinnati	1.35	1.30	1.40	**1.50@1.70**
S. E. Ky. screenings	Cincinnati	1.30	1.25	1.30	**1.35@1.50**
Kansas lump	Kansas City	5.00	4.50	4.50	4.00@4.50
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

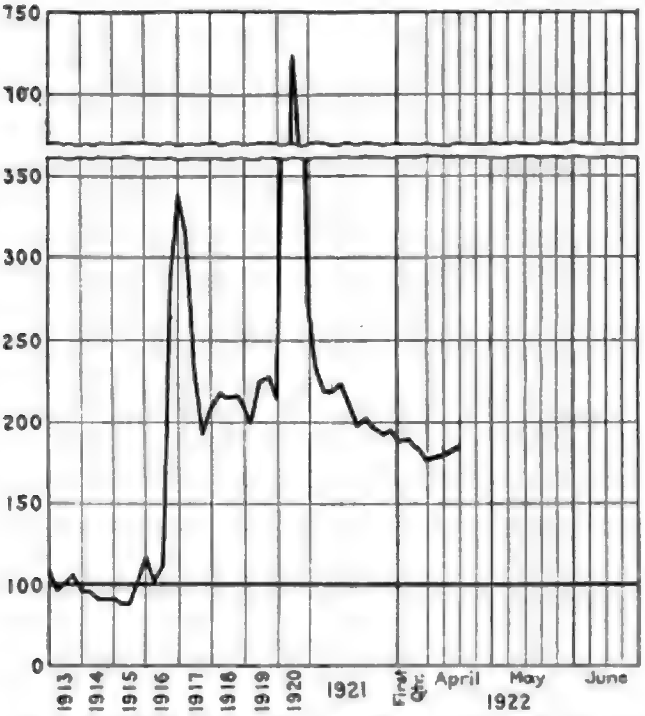
*Gross tons, f.o.b. vessel, Hampton Roads.

†Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	March 27, 1922 Independent	March 27, 1922 Company	April 3, 1922 Independent	April 3, 1922 Company	April 10, 1922† Independent	April 10, 1922† Company
Broken	New York	$2.61	.....	$7.60@$7.75	.....	$7.60@$7.75		$7.60@$7.75
Broken	Philadelphia	2.66	$7.00@$7.50	7.75@7.85	$7.00@$7.50	7.75@7.85		7.75@7.85
Egg	New York	2.61	7.60@7.75	7.60@7.75	7.60@7.75	7.60@7.75	**$7.75@$8.00**	7.60@7.75
Egg	Philadelphia	2.66	7.25@7.75	7.75	7.25@7.75	7.75		7.75
Egg	Chicago	5.63	*7.50	*6.95@7.40	*7.50	*6.95@7.40		*6.95@7.40
Stove	New York	2.61	7.90@8.10	7.90@8.10	7.90@8.20	7.90@8.10	**8.10@8.50**	7.90@8.10
Stove	Philadelphia	2.66	7.85@8.15	8.05@8.25	7.85@8.15	8.05@8.25		8.05@8.25
Stove	Chicago	5.63	*7.75	*7.20@7.60	*7.75	*7.20@7.60		*7.20@7.60
Chestnut	New York	2.61	7.90@8.10	7.90@8.10	7.90@8.20	7.90@8.10	**8.10@8.50**	7.90@8.10
Chestnut	Philadelphia	2.66	7.85@8.15	8.05@8.25	7.85@8.15	8.05@8.25		8.05@8.25
Chestnut	Chicago	5.63	*7.75	*7.20@7.60	*7.75	7.20@7.60		*7.20@7.60
Pea	New York	2.47	5.00@5.50	5.75@6.45	5.00@5.75	5.75@6.45	**5.25@6.00**	6.00@6.45
Pea	Philadelphia	2.38	5.50@6.00	6.15@6.25	5.50@6.00	6.15@6.25		6.15@6.25
Pea	Chicago	5.63	*6.10	*5.60@6.10	*6.10	5.60@6.10		*5.60@6.10
Buckwheat No. 1	New York	2.47	2.75@3.50	3.50	2.75@3.50	3.50	**3.00@3.50**	3.50
Buckwheat No. 1	Philadelphia	2.38	2.75@3.25	3.50	2.75@3.25	3.50		3.50
Rice	New York	2.47	2.00@2.50	2.50	2.00@2.50	2.50	2.00@2.50	2.50
Rice	Philadelphia	2.38	2.00@2.50	2.50	2.00@2.50	2.50		2.50
Barley	New York	2.47	1.50@1.85	1.50	1.50@1.85	1.50	1.50@1.85	1.50
Barley	Philadelphia	2.38	1.50@1.75	1.50	1.50@1.75	1.50		1.50
Birdseye	New York	2.47	....	2.00@2.50	.....	2.00@2.50		2.00@2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index 181, Week of April 10, 1922. Average spot price for same period, $2.19. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Hocking and Pittsburgh prices not included in figures for last week.)

non-union grades are so far unaffected in price by the mining disturbance.

ANTHRACITE

Anthracite production was heavy in the last five days before the strike. The output was 1,896,000 net tons as compared with 2,095,000 tons in the preceding week, the decrease being entirely due to the stoppage on April 1. Curtailment of production was practically 100 per cent effective after the first of the month. The call for domestic sizes, however, was not sufficiently strong to raise independent prices.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Mar. 25, 1922 Inclusive	Week Ended Mar. 25
U. S. Total	45.6	55.5	63.7
Non-Union			
Alabama	63.5	63.8	74.1
Somerset County	55.5	75.3	74.8
Panhandle, W. Va.	55.3	50.6	64.5
Westmoreland	54.9	56.6	55.4
Virginia	54.8	59.0	66.6
Harlan	53.3	54.7	62.7
Hazard	51.7	59.5	45.7
Pocahontas	49.8	59.9	59.9
Tug River	48.1	63.2	60.7
Logan	47.6	60.9	65.6
Cumberland-Piedmont	46.6	50.4	51.5
Winding Gulf	45.7	64.1	68.9
Kenova-Thacker	38.2	54.1	60.2
N. E. Kentucky	32.9	46.8	56.2
New River‡	24.3	38.5	34.2
Union			
Oklahoma	63.9	60.7	52.1
Iowa	57.4	78.7	84.1
Ohio, north and central	52.6	46.4	58.6
Missouri	50.7	67.1	78.6
Illinois	44.8	54.4	65.6
Kansas	42.0	55.3	73.6
Indiana	41.4	53.6	61.5
Pittsburgh†	41.2	39.3	47.1
Central Pennsylvania	39.1	50.1	58.8
Fairmont	35.3	46.9	46.9
Western Kentucky	32.5	37.2	35.6
Pittsburgh*	30.4	31.6	45.2
Kanawha	26.0	13.3	12.0
Ohio, southern	22.9	24.5	25.3

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

Companies have been picking up their storage piles and at this writing the supply is about cleaned up, with the exception of pea coal. Steam stocks at the mines are moving well, with barley the most active size. Independents have no storage piles and their coal is out of the market. Retail trade is sluggish. Warm weather has reduced current requirements and no householder wants to lay in next season's needs with lower coal prices in prospect at that time.

COKE

Production of beehive coke was 191,000 net tons during the last week of March, an increase of 16,000 tons over the preceding week's output and the heaviest of the year. The output in the lower Connellsville region has been more than cut in half by the strike of non-union miners. At the first sign of shortage, low-priced coke disappeared from the market and finally but little tonnage was available. There has been no bidding for the limited coke made, users whose contract supply was affected preferred to bank rather than offer prices which would render their production costs out of line with the sales price of their product.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

GERMANY—Production of coal in the Ruhr region during the week ended March 25 was 1,975,000 metric tons, according to a cable to *Coal Age*, or 20,000 tons in excess of the preceding week's output.

ITALY — The price of Cardiff steam first is quoted at 40s. 9d., according to a cable to *Coal Age*. Last week's figure was 41s. 3d.

The exploitation of Italian peat-beds has commenced in earnest, additional plants having recently been erected to deal with the vast deposits situated in the mountainous district of Laga. Before the war, owing to the low price of coal, it was not considered remunerative to work these deposits; but now, owing to high freights, exchange and increased cost of labor, the enterprise is again being taken up.

CZECHOSLOVAKIA — The Gazette de Prague reports that with a view to facilitate the export of coal, the Minister of Commerce has abolished the export tax on this article.

BELGIUM—There is nothing of great interest to report in the market and the indecision regarding the coal-miners' wages does not allow any important modification of the trend of the market. Official price reductions for certain kinds vary 3fr.@6fr. per ton, according to quality and district, but certain collieries, desiring to get rid of heavy stocks, are making heavier cuts.

Production during February was 1,759,670 metric tons and mine stocks on March 1, totaled 901,920 tons.

FRANCE—At a meeting of the Directeurs de Mines du Nord et du Pas-de-Calais, it was decided, contrary to custom, to enforce, immediately the new tariffs which have just been established. The reduction on domestic coals, thanks to the so-called summer bounty on screened only, is important. The same cannot be said of industrial coals, except slack descriptions, on which the mines will allow important rebates for large quantities.

SPAIN—Coal freights from the Austurias to Barcelona are quiet, the quotation being 15 pesetas. Large coals are offered at 85 pesetas and small at 62 pesetas.

Bad Weather Causes Decline in British Output; Large Coals Strong and in Good Demand

BRITISH production during the week ended March 25 was 4,920,000 gross tons, according to a cable to *Coal Age*. This is a slight decline from the previous week's output, which was 4,957,000 tons. Bad weather in South Wales interfered with the industry. Large coals are strong and are being heavily booked. Other kinds are generally easy.

Shipments of bunker coal during February for use of steamers engaged in the foreign trade were 1,409,007 tons, as compared with 1,038,732 in the corresponding month last year. During the first two months of this year 2,859,743 tons were shipped.

The strongest market in the north of England is for gas coals. The Helsingfors gasworks has ordered 7,500 tons best gas at 31s. c.i.f., and 2,500 tons of coking coal for transit during April. Copenhagen gasworks has inquired for 90,000 tons of Durham gas; Defzyl and Harlingen gasworks, 15,000 tons; Gothenburg, 6,000 tons. The revival in the coking industry, just becoming apparent, has helped somewhat to offset the effects of the engineering dispute.

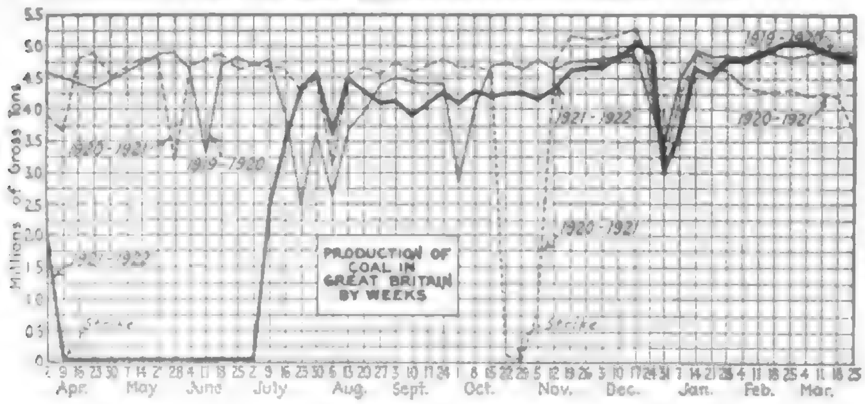
In Scotland there has been an improvement in the export and coastwise trades, due to the improvement in the north Europe weather conditions. The industrial demand in Scotland continues to be slack, and matters are not, of course, helped by the industrial situation. During the week ended March 25 the foreign and coastwise shipments from Scotland totaled 275,505 tons, an increase of 25,567 tons on the figure for the previous week.

Scottish miners' delegates have sent a resolution to the Miners' Federation, complaining that they are unable to obtain from the owners information as to the making up of production figures on the basis of which wage rates are regulated.

The new principle of wage regulation, embodied in the terms of settlement, based as it is on a system of profit-sharing, is essentially one devised to increase production and reduce expenses to the minimum. The extent of the owners' profits, no less than the men's earnings, depend upon efficient and economical working, and it is as much to the interest of one party as to the other to cut down waste and reduce costs wherever possible.

That economy has been effected is seen from the fact that within the last fifteen months the cost of timber and stores has been brought down from 6s. 5.33d. to about 3s. Other costs, which include staff salaries, depreciation, repairs, pensions, local rates and welfare levy charges, are outside of the control of the owners, and as they do not vary greatly, no great reduction in these items has been possible.

Referring to the sacrifices made by miners and mine owners to bring down the price of coal, the secretary of the Northumberland Miners' Association points out that the trading profit of that county for the last six months was £158,340. This sum does not represent more than 2 to 3 per cent per annum on invested capital.



United States February Exports of Coal and Coke, by Customs Districts

Customs Districts	Anthracite (Gross Tons)	Bituminous (Gross Tons)	Coke (Gross Tons)
Maine and N. H.	82	....	149
Vermont	1,075	788	76
Massachusetts	126	....	
St. Lawrence	86,999	170,457	683
Rochester	3,932	31,009	41
Buffalo	164,254	387,923	8,597
New York	5,476	607	88
Philadelphia	10,120	23,044	1,373
Maryland		19,141	5,299
Virginia		103,489	....
South Carolina		12,025	71
Florida	464	6,322	....
Mobile	....	112	....
New Orleans		678	1,250
Galveston	1	....	....
San Antonio	40	40	....
El Paso	34	4,069	3
San Diego	....	13	..
Arizona	....	1,093	30
San Francisco		44	5
Washington	....	678	109
Dakota	920	1,673	4,913
Duluth and Superior	258	6,794	590
Michigan	1,124	43,588	10,257
Total	274,905	813,587	31,534

Hampton Roads Market Is Listless

Dumpings at Hampton Roads were only slightly above normal last week, the effect of the coal strike not having been materially felt. Supplies from the mines were cut down, the greater amount being on the C. & O., with some of the mines of the Virginian also out.

The market was unchanged, prices of former weeks remaining with fluctuations of 5@10c. in some instances. April contracts were little in evidence, the first time in many years that offices of dealers here had not been notified of awards.

A tone of listlessness was in the market in spite of anticipated activity as result of the strike. A period of watchful waiting has set in, and while shippers are optimistic they have no real business in sight.

Hampton Roads Pier Situation

	Week Ended March 30	Week Ended April 6
N. & W. Piers, Lamberts Point:		
Cars on hand	1,588	1,849
Tons on hand	84,832	99,448
Tons dumped	153,791	152,501
Tonnage waiting	14,150	25,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,624	1,397
Tons on hand	81,200	69,850
Tons dumped	108,862	120,571
Tonnage waiting	30,560	12,000
C. & O. Piers, Newport News:		
Cars on hand	1,494	1,291
Tons on hand	74,700	64,550
Tons dumped	57,065	94,118
Tonnage waiting	7,625	1,970

Export Clearances, Week Ended April 6, 1922

FROM HAMPTON ROADS:

	Tons:
For Africa	
Br. S.S. Heathfield, for Dakar	7,007
For Atlantic Islands:	
Nor. S.S. Gro, for Kingston	4,920
Nor. S.S. Hallgjerd, for Curacao	2,059
For Brazil:	
Br. S.S. Coquetmede, for Para	5,501
Du. S.S. Alkmaar, for Rio de Janeiro	9,725
For Chile:	
Am. S.S. Argosy, for Iquique	1,556
Dan. S.S. Nordkap, for Valparaiso	4,517
For Cuba:	
Am. Schr. Perry Setzer, for Cienfuegos	1,827
For Italy:	
Ital. S.S. Susana, for Genoa	5,275
Jap. S.S. Kahsu Maru, for Portoferrajo	6,958
For Mexico:	
Dan. S.S. Normannia, for Vera Cruz	3,738
For Spain:	
Ital. S.S. Monte Grappa, for Gibraltar	8,647
Jap. S.S. England Maru, for Gibraltar	7,200
Br. S.S. South American, for St. Lucia	3,041

Pier and Bunker Prices, Gross Tons

	April 1	April 8†
PIERS		
Pool 9, New York	$5.35@$5.65	**$5.40@$5.80**
Pool 10, New York	5.10@5.35	**5.20@5.40**
Pool 9, Philadelphia	5.40@5.70	5.40@5.70
Pool 10, Philadelphia	5.00@5.35	**5.00@5.40**
Pool 71, Philadelphia	5.55@5.80	**5.65@5.90**
Pool 1, Hamp. Rds.	4.60@4.70	*4.50@4.70*
Pools 5-6-7 Hamp. Rds	4.30	*4.25*
Pool 2, Hamp. Rds.	4.45@4.50	4.45@4.50
BUNKERS		
Pool 9, New York	$5.75@$6.10	**$5.75@$6.25**
Pool 10, New York	5.45@5.70	**5.55@5.80**
Pool 9, Philadelphia	5.60@5.85	**5.60@5.90**
Pool 10, Philadelphia	5.20@5.60	**5.30@5.60**
Pool 1, Hamp. Rds.	4.55	*4.75*
Pool 2, Hamp. Rds.	4.60	*4.[illegible]*
Welsh, Gibraltar	40s. 6d. f.o.b.	40s. 6d. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	42s. t.i.b.	42s. t.i.b.
Welsh, Messina	38s. t.i.b.	38s. t.i.b.
Welsh, Algiers	38s. 6d. f.o.b.	38s. 6d. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b
Welsh, Madeira	38s. f.a.s.	38s. f.a.s.
Welsh, Teneriffe	38s. f.a.s.	38s. f.a.s.
Welsh, Malta	42s. f.o.b.	42s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b
Belgian, Antwerp	30s.	30s.
Alexandria	45s.	45s.
Bombay	38 rupees	38 rupees
Capetown	39s.	39s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

	April 1	April 8†
Cardiff:		
Admiralty, Large	27s.@27s. 6d.	**27s.9d.@28s.3d.**
Steam, Smalls	19s.@19s. 6d.	19s.@19s. 6d.
Newcastle:		
Best Steams	23s.@23s. 6d.	**23s.9d.@24s.3d.**
Best Gas	24s.@24s. 6d.	**24s.@25s.**
Best Bunkers	22s.@22s. 9d.	**23s. 6d.**

†Advances over previous week shown in heavy type, declines in italics.

North Atlantic

Current Demand Unchanged Interest in Market Keen

Union Inroads in Open-Shop Domain Attract Buyers' Attention — Non-Union Prices Show Stimulus—Shippers Cautious in Forward Quotations —Flurry Evidenced in Increased Inquiries.

WHILE current demand is unimproved, greater interest is being shown in the market. The union inroads made in open-shop territories have caused buyers to follow the market more closely. Non-union prices have been stimulated and shippers are more cautious in making forward quotations, but so far the flurry is manifested only in an increasing number of inquiries and movement of spot tonnage has not been heavier.

Substitute tonnage for those non-union producers who have closed has been easily obtainable. With this slight indication of trouble, however, consumers are more prone to deal with their old connections, even at higher prices, with a view to better service if a pinch comes.

PHILADELPHIA

From the standpoint of demand the market continues unpleasingly quiet to the shippers, as the consumer refuses to be stirred by any possibility of a shortage. On this account prices have remained very soft.

Some producers with non-union connections have been a bit disappointed this week at losing tonnage which they had depended upon on account of the men deciding not to work. Of course, it has been easy to cover on these orders through other producers, if necessary, but the defections have been sufficient to cause all quotations to be made guardedly.

What little buying has been done of late has been closely confined to regular sources by the consumer, often passing up lower prices to favor old shippers. This seems to be with the idea that should real trouble come they will be better served in a pinch by thus concentrating their business.

There has been some noticeable improvement in iron manufacture and these concerns are buying better than for some months. Some who have not yet resumed working are nevertheless putting coal in reserve.

BALTIMORE

The second week of the strike started off with the demand being little in excess of the pre-strike days. Prices, however, began to spurt a bit at the close of last week, and a further upward tendency was anticipated. Deliveries from non-union sources were fully up to the demand so that the explanation for the advancing market lies in the likelihood of a generally tighter market.

The lack of real live demand is indicated in the fact that on the Western Maryland and Baltimore & Ohio alone there are more than 3,000 cars loaded with unsold coal standing on sidings.

FAIRMONT

Operations were largely suspended on April 1, although there were still about 60 non-union mines running at various points. The response to the strike order was general at all union mines. Organizers succeeded in closing a few non-union operations before the date set for the strike.

Many sidings were filled with coal when the strike became effective. Railroad fuel loadings were heavier in the days immediately preceding the strike.

NEW YORK

Buyers were not expected to rush into the market so early in the month, having been preparing for the present situation for a long time. However, with the non-union miners joining the strikers' ranks it was expected that the middle of the month would see a more active market.

There were about 1,900 cars of coal at the local docks on April 7. This was about 200 cars more than on the corresponding day of the previous week.

The joining of the strikers' ranks by some of the non-union miners was no surprise to many local tradesmen. The various steel companies entered the market toward the end of the week and were buying more freely.

Public utilities and large industrial plants continue to lay in reserve stocks. Southern coals are coming forward in large quantities.

For some time much of the coal coming forward has been from non-union mines. This was due to the impossibility of the unionized mines to compete with the low priced non-union coal, resulting in a curtailing of production at the union operations, most of the latter coals being either under contract or on consignment.

CENTRAL PENNSYLVANIA

Production figures show that the output since the strike began is but one-fourth of what it was before. March production was 84,828 carloads, or an average of 3,143 cars a day. On April 1, the production was 704 cars; 781 cars on April 3, and 806 on April 4.

Non-union miners are gradually laying down their tools and deserting the mines. It is reported that the U. M. W. have reduced the initiation fee from $5 to 50c. in most of the non-union districts in order to get the men out.

UPPER POTOMAC

Response to the strike call was not as general as the officials of the union had anticipated, for 16 Upper Potomac mines were producing in the week following the beginning of the strike. In the Georges Creek field there was a more general response. Despite the cessation of operations in so many fields, there was no change in market conditions. Orders and inquiries were on as small a scale as ever and prices were still soft.

Coke

CONNELLSVILLE

Strikes have proved much greater than was expected. The Connellsville region has been producing fairly well since April 1 but the lower Connellsville output in both coal and coke is reduced by more than one-half. Organizing by U. M. W. agents appears to have proceeded farther than was realized.

The first result of the strike was the disappearance of odd-lot offerings of spot furnace coke to avoid demurrage, as the railroads became quite lenient in the matter of demurrage. Then coke practically disappeared from the market. Furnaces whose contract shipments were curtailed or discontinued entirely decided that they would simply bank, rather than bid up the market. At the same time furnaces have become very reserved in the matter of selling pig iron. As the furnaces have pig iron sold at recent prices they assert they cannot pay any advance for coke.

The *Courier* reports production during the week ended April 1 at 97,500 tons by the furnace ovens and 52,460 tons by the merchant ovens, making a total of 149,960 tons, an increase of 15,550 tons.

UNIONTOWN

Two distinct developments have been created in the Connellsville non-union field. An intensive effort is being made to introduce the strike into this region, which has met with temporary success in the upper Monongahela Valley and the Republic district. A definite market rise has been produced by consumers seeking tonnage where none is to be had immediately. The following prices are effective but are subject to revision at any moment: Pittsburgh steam, $2@$2.50; Sewickley steam, $1.75@$2, and byproduct $2.25@$2.50.

Various claims of union accessions have been made. Meantime every precaution is being taken to preserve order and only one untoward incident has developed as yet; the cutting of the transmission line of the Frick Maxwell plant. Many plants are being enclosed by barbed wire and hundreds of special deputies have been sworn in to guard mine property.

The adjoining Westmoreland and Somerset regions are reported unaffected by the strike. Mines of the Greensburg, Keystone and Westmoreland coal companies are working as usual. Somerset production is increasing. There are about 13,500 miners in that region, 500 of whom belong to the union.

BUFFALO

Production of coke has been much curtailed, but the demand is not large. Prices are about the same as they have been, $4.50@$4.75 for Connellsville foundry, $3.25@$3.50 for 48-hr. furnace and $3 for some domestic sizes, adding $3.64 for freight.

Anthracite

Companies Low on Domestic Coal; Steam Sizes Active

Independents Out of Fuel — Prices Quoted Only at New York, Where Tonnage Is in Harbor—Retail Markets Quiet, Due to Warm Weather and Prospect of Lower Prices.

COMPANIES have been shipping from storage since the strike began and the supply has already been picked up, with the exception of pea coal. The steam business centers around the companies' mine storage and barley is fast being cleaned up, while other grades move easily. Independents are out of coal and no prices are quoted with the exception of New York, where some tonnage is afloat in the harbor.

Retail markets are quiet. Warm weather has removed much of the urge to buy and householders are not inclined to stock against next season's needs, with lower coal prices in prospect at that time.

NEW YORK

There is no greater market activity than before April 1. With plenty of company coals to be had dealers are not anxious to lay in independent fuels unless they are procurable at less than company schedule. The latter has not been an impossibility entirely in some instances.

Lack of anxiety as well as demand is causing some uneasiness to those dealers who in anticipation of a scarcity after April 1 bought heavily, loading the coal in boats to await a favorable market. In some instances these loadings have been thrown back into the market but buyers are not tumbling over themselves to get additional tonnage. The companies are taking care of their regular customers as long as the supply lasts.

Steam coals are plentiful notwithstanding the fair demand for months past. Not much interest is being shown. Barley is scarcer than either of the other two sizes. The better grades of independent coals are in strong demand.

PHILADELPHIA

The first week of the strike has been very uneventful from the consumer's standpoint, although it can be said that the retailers have been fairly busy. However, it seems certain that the bulk of the buying has been on account of the colder weather.

The only companies who have coal to offer are the large ones, who on account of their storage yards have been able to take orders for all grades, but all family sizes but pea will be cleaned up before April 15.

At the rate the dealers are moving the family sizes out of their yards it will certainly not take more than 30 days before they are emptied, and should this time arrive without settlement of the suspension there will be a run on the storage yard pea.

So far as the independents are concerned they have no prices, as they are without coal. Retail prices are stronger than at any time during the past winter, and the general run is $13.75 for egg, $14 for stove and nut and $11 for pea.

The steam coal trade is entirely centered around the companies, as they still have considerable storage stock to dispose of. Barley is fast reaching exhaustion. Rice is also moving well, and while there is still quite a heavy tonnage of buckwheat to be had, there always remains the likelihood that the railroads will take up the balance, should bituminous conditions become such as to curtail seriously their supply.

BUFFALO

Retailers have found the trade very light during the past week, the weather having been so moderate that consumption has been reduced to a minimum. There seems little probability of any strongly increased demand right away, although it is said that a drop of many degrees in temperature would no doubt bring in a fair amount of business.

Dealers' stocks in most cases are ample, although some waited until the last minute before buying, as they were hopeful that something would interfere to prevent a strike. Steam sizes are in fair supply, but are little wanted.

BOSTON

Retail demand is dropping off with the warmer weather. Most dealers are carrying heavy stocks and there was little additional buying in the last week. Certain buyers are inclined to accumulate egg, it being their idea that this will probably be the short size when mining is resumed.

Some of the producing companies have already picked up all the domestic sizes they had in storage, except pea. Others have egg and stove in storage, but no chestnut, and the former sizes are being gradually worked off in response to the rather small scattering demand.

By water there is still a certain amount of tonnage arriving. There is a small accumulation of boats at certain of the loading piers, but it is expected these will be loaded and on the way by the end of the week.

ANTHRACITE FIELDS

There has not been the slightest kind of disturbance in any part of the field. The Red Ash Coal Co. has applied to the union for permission to employ 260 men for a period of ten weeks to remove some coal that is in the way of the Hudson Coal Co. fighting the fire in the Red Ash Mine. The Lee Coal Co. has also asked to employ some men to sink a slope to reach a mine fire that is on its property.

Some objections have been raised by the miners as to the number of men employed on repair and maintenance work during the suspension. The shops of the various companies which have been operating on full time have gone on part time throwing hundreds of men not belonging to the union on part time.

One of the companies has laid off its pumpmen at one of the collieries and is employing the mine foremen and their assistants for this purpose. This is causing some trouble with the grievance committees.

BALTIMORE

The hard coal situation is at a practical standstill. Coal dealers, even if they could get fuel from the mines, are not particularly interested in coal for storage at present prices. They have enough on hand to care for a time at least for the small demand that comes forward at the inception of the warm period.

South

BIRMINGHAM

Production is undisturbed and the output is closely approximating the normal weekly record. There is practically no defection in labor forces, both union and non-union mines operating on schedules in line with trade requirements. However, the union has a negligible representation in this field, only a few small operations having union working agreements. There is a disposition on the part of workers to put in full time and there is an ample labor supply to produce the maximum requirements under a greatly increased demand, with sufficient surplus to care for any outside orders which might be placed here.

Consumers are not yet inclined to buy coal beyond future needs of a few weeks. Need for fuel from industrial sources has not improved materially over the record of the past several weeks. The mainstay of production is the large amount of coal that is being coked for furnace use, with some better demand for foundry coke, and coal being taken by the railroads at contract mines.

The domestic market is very dull, with little interest so far manifested in contracting. Many yards still have coal left over from the reign of high prices and there is scarcely any retail demand at this time. Mine prices on steam and domestic grades are practically unchanged.

VIRGINIA

As the month drew to a close, mines speeded up production, the gain amounting to about 5 per cent of the total capacity. The most marked increase was in the section served by the C. C. & O. Virginia mines were unaffected by the strike and the better production was continued at about the same rate during the first few days of April. Prices remained on a low level.

Mines on the Interstate R.R. produced at the rate of more than 70 per cent of capacity. It was not so much because of any increased activity in spot buying as it was because of increased contract shipments that a larger production was made possible.

Chicago and Midwest

Midwest Region Alert Though Market Is Flat

Coal Men Anxiously Watch for Revival But a Few Industrial Inquiries and One Railroad Purchase Are All That Appear—Screenings Climbing.

NOTHING has stirred the Midwest market into any semblance of activity during the past week. There is only a little spot buying and no contracting. But coal men are adopting the familiar attitude of the cat at the rat hole. A certain tension is growing out of this which is having a slight effect upon the market. It already has stabilized those prices which sagged April 1 and started an upward trend to quotations on steam sizes. There remained at the end of the week somewhere in the neighborhood of 10,000 cars of coal unbilled in Illinois fields and every Middle-Eastern and Eastern field that feeds into the Midwest region was also full of loads.

A slow awakening of certain lines of industry was noted by some of the Midwest coal companies. Blast furnaces are especially encouraging to Western coal men just now because almost every mine has from a few cars to several trainloads of lump and other large size coals which would fit well into the process of steel making.

Big buyers are not showing themselves in the market. They are expected to, however, now that the strike appears to be starting a long course. All sorts of rumors about them are flitting around, rising partly from the fact that a railroad began buying more dock coal. Some manufacturing interests have been inquiring for contract prices for days without much success. Only a few producers are willing to sign any contracts and most of those are in the western Kentucky field that has a wage contract running another year. One Pocahontas producer, however, was offering contract mine run at $1.75, a price which was considered to be about at the spot market level. He got few takers.

Soft weather has held the domestic market down fairly flat. But dealers continue to take coal little by little and apparently are not afraid to have a good deal in their yards. They are about the only buyers of the thin stream of Illinois and Indiana coal that is still running. Operators have made it plain that prices on domestic sizes will not drop a cent. Coal trains will be allowed to rust on railroad sidings before that lump and egg will be sold for less than $3.25@$3.65 in the case of southern Illinois coals—and $2.75@$3.50—for Indiana fuel.

With the prices of screenings mounting, some operators say they are getting ready to put some of their large sizes through crushers. At least two of the crushers in southern Illinois are working now.

CHICAGO

Coal men in Chicago are going through a strange experience. Every day they expect something to happen. And almost every day they are disappointed. There is practically no demand for anything, but the fact that the strike now appears to give promise of a long run makes most men think important consumers will start to buy at almost any moment and the only selling agencies which will get in on the business are the ones who keep a keen ear pressed close against the grass roots. Salesmen's conferences in the home offices are going on all the time preparatory to what may pop out of the future.

Even though nothing has occurred to start a buying rush, all prices have firmed up. The slump is definitely over even among Eastern coals which are available here in almost any quantity at any time. Smokeless mine run, which sold in small quantities a few days ago for only a little over $1, can hardly be found at less than $2.30@$2.50 now and the standard quotation is supposed to be $2. Screened varieties are low in price and are hard to sell. Company circular on Illinois coals has not changed, but southern Illinois screenings have been going at $2.50 and in one case touched $2.75, though the standard quotation is only $2.25.

The retail trade is stagnant, thanks to balmy weather. A few people have harkened to the advertising messages of the retail merchants that coal is likely to go up, but buying is slow.

WEST KENTUCKY

Most of the field remains on the job and is in position to take advantage of every demand that develops. One section of the field is under a no-strike contract clause which has a year to run. The other field also continues at work.

As of April 1, there were 1,019 cars of unbilled coal on tracks of western Kentucky, distributed, 584 cars on the I.C., 207 cars on the Henderson, and 228 cars on the L. & N. Much of it is lump. While the spot market is steady some jobbers and operators think demand will be much stronger and prices stiffer within ten days, and are afraid to quote the market for April. Some jobbers are willing to accept $2 for mine run for the month of April, others want $2.50, and some are quoting for but one week.

One of the largest operating companies has quoted prices to April 9, spot, not including brokerage of 15c. a ton, as follows: Mine run, $2; 1¼-in. pea and slack, $1.75; 2½-in. nut, pea and slack, $1.90; nut, $2.10; egg, $2.25; 1¼-in. lump, $2.25; 2½-in. lump, $2.35; 6-in. block, $2.60.

SOUTHERN ILLINOIS

Since April 1 there has been little demand for coal remaining on track. Prices in the Carterville field are $3.65 on lump, egg and nut. Mt. Olive is $3 on lump and egg, and Standard ranges from $2.50 on 2 x 6-in. steam egg to $2.75 on 6-in. lump and 3 x 6 egg.

Screenings, however, are hard to get as most of this size on track is being held by the operators for their own boilers. Some mines in the Carterville field have as much as two weeks' supply of prepared sizes on hand. There were approximately 2,700 unbilled cars in the Fifth and Ninth Districts April 3. There seems to be little doubt that supplies in this territory will last at least 60 days.

INDIANAPOLIS

No change is to be seen in the market so far as prices are concerned. Industrials have built up reserves so it is likely to be some time before they again are in the market. In the meantime many of the mines have cars on track that have not been moved.

Unless the industrial demand grows during the spring and summer the non-union mines will be able to meet most of the needs. It is significant to note that the price of retail coal has not dropped. No such spring drop is looked for in spite of the fact that all retail stocks are heavy.

ST. LOUIS

Domestic and steam requirements in St. Louis and adjacent territory are well protected for 60 days, with some of the larger steam users having a supply of more than 90 days. No interest in domestic demand is evidenced. The weather has been too warm for that. The retail dealers are carrying large stocks and in some instances paying demurrage on coal for which they have no bin space. Anthracite demand is dead. Smokeless coals and coke continue to move slowly. Prices have not changed since April 1.

LOUISVILLE

The demand for coal as a whole is quiet. More mines are reported down as a result of lack of business, than because of the strike. Even in the western Kentucky field where there is no strike, many mines are down. In southeastern Kentucky, a few mines are down in Harlan and Bell counties, but not many. In Hazard, Elkhorn and northeastern Kentucky no strikes are reported. Most fields have much coal loaded and ready to ship.

It is claimed there is at least six weeks' supply in this district held by most of the industrial consumers, retailers, and buyers whom they generally supply. Consumers are not worrying. Unless the strike lasts several weeks there is not much prospect of any heavy demand or material advance in prices.

Canada

TORONTO

Dealers report a fair amount of domestic business, but orders are almost without exception for small quantities, and very few have laid in supplies for more than a few weeks ahead. While public utilities and the larger consumers are fairly well stocked up with bituminous, the smaller industrial plants are liable to run short of fuel should the strike last for a month.

Northwest

No Coal Chills Afflict Consumers in Northwest

That Region Still Feels It Is Better Fixed for Fuel Than Any Other Section — Prices Are Firm — Weather Cuts Home Trade.

TRANQUILLITY prevails through the Northwest. Stocks on hand appear to be satisfactory to railroads, utilities and manufacturing plants and to retail yards. The market is dead but prices remain firm—so firm, in fact, that the usual spring drop on anthracite has not been announced and probably will not be. Coal men and some other observers are spending a good deal of time figuring just how long the Northwest could hold out in case no more coal were received. The limit is fixed now at about 110 days. But shipments by Lake are scheduled to appear soon after navigation starts. No boats are expected for some time because in spite of softening weather that has kept the domestic trade dormant, there still remains some thick ice offshore.

MINNEAPOLIS

There seems to be no present apprehension in the Northwest, over the strike. The feeling in the coal trade generally is that only through a strike will it be possible to readjust labor costs in mining. The public hereabouts is inclined to charge the operators with contributory guilt in the matter of excessive prices, but recognizes that labor must take its share of decrease.

Coal shipments to the interior have increased during the past two or three weeks, but it was as much due to the prolonged winter weather as to any desire to be stocked against the strike. With the tonnage on the docks equal to three months' summer requirements, there is nothing to fear just now. So all hands in the coal business feel well satisfied with conditions now. Men with stores on hand hope to sell at good prices some fuel they couldn't have disposed of in a normal summer. But there is no sign of a price hoist by legitimate members of the trade. Scalpers and speculators may take advantage of the situation, however, as they did a year ago last fall. Then the coal trade will receive the blame as usual.

The estimate of tonnage, hard and soft, on the docks April 1, is 3,250,000—of which about 425,000 tons are hard coal. Large users, public utility plants and others, have stocked to their limit. The railroads are also well supplied from all-rail sources. Aside from these there is not a great deal in dealers' or consumers' bins.

MILWAUKEE

Mild spring weather exercises a tranquil influence on the coal market, despite the strike. Wholesalers and retailers have assumed a waiting attitude, seemingly content with the visible supply in the dock yards. Orders are being filled promptly and without restriction. Prices are steady, though the demand is light.

The Chicago & Northwestern Ry. Co. has accumulated quite a coal dump near their depot on the lake front here, and a report from Janesville, Wis., states the same railway company has 52,000 tons of soft coal piled up at that point.

DULUTH

Prevailing indications of "normalcy" are evident in the coal market at the Head-of-the-Lakes. The coal strike, after a slight flurry the first day, has had little or no effect on the Duluth-Superior market. Prices are firm, buying is almost at a standstill which is natural at this season of the year, and dealers and dock men are sitting tight awaiting developments.

The only unusual feature in the price market is its sameness. Prices quoted a week ago in anthracite and bituminous still prevail. It is usual for anthracite to drop 50c. on April 1—but not this year.

The majority in the coal business here think Head-of-the-Lakes stocks will last 100 to 110 days longer. This is assuming a normal demand. But it is possible that the demand may be above normal if the strike continues and consumers become anxious. No one is worrying at present, though all seem to think that the strike will be settled long before stocks become exhausted.

At least a few cargoes of coal will come to this port in spite of the strike. Several bottoms have been loaded at Lake Erie ports and some of these will come to Duluth as soon as navigation opens. This may not be for some time, as one tug which ventured out from the harbor here was stopped within less than half a mile by ice more than a foot in thickness.

Mining companies of the Mesaba Iron Range are showing signs of returning to work, and several inquiries have been received from these for coal but no purchases made.

New England

Market Deadly Dull Despite Strike Spread to New River

Coal Being Mined Meets Current Needs —Much Unsold Smokeless on Hand —Little Being Done on New Contracts—Marine Freights Unchanged as Yet.

IN SPITE of the New River mines joining the strikers the New England market remains extremely quiet. Non-union Pennsylvania grades are unaffected in price and enough coal is being mined to meet current needs. There is still much unsold smokeless tonnage on hand, which precludes any strength to the market. The heavier water receipts are due to consumers taking advantage of the continued low prices and not to any increase in requirements. Next to nothing is being done on new contracts, as both sides are in an uncertain position.

Marine freights are unchanged but must soon respond to the dearth of orders.

Notwithstanding more or less alarming reports from the New River district, the market here remains unchanged. Inquiry is only scattering. Large buyers show practically no interest in spot quotations and for Inland distribution prices are on about the same level as for some weeks past. At Mystic Wharf, Boston, the range is \$6@\$6.15 for small lots, while close buyers can make purchases at somewhat less than the lower figure.

At Hampton Roads the desirable grades are in easy supply. Even though non-union operations have been affected, it is still possible to buy Pool 1 coals on as low a basis as at any time this season. For contract the several agencies are reluctant to commit themselves for any extended period.

In this market next to nothing has been heard with respect to contracts for more than a fortnight. Current quotations are shown in the Weekly Review.

Receipts by water continue in fair volume. Arrivals have increased recently, but this is due more to disposition on the part of steam-users to accept deliveries on purchases rather than speculate on getting supplies later on. Relatively only a few consumers in this territory are still drawing their supplies by the all-rail route.

While there are as yet no definite freight quotations on a level lower than during March, there is every reason to expect a material softening in rates. Spot orders are reasonably scarce and more than likely rates will soon respond to pressure. On barges, 2,000 tons upward, \$1@\$1.15 would still have to be paid, but steamers can be chartered at \$1@\$1.10.

Non-union Pennsylvania grades seem to have been unaffected by the suspension. So far as this section is concerned, no higher prices have yet been reported, and apparently there are enough operations still working to meet current requirements.

Eastern Inland

Reduced Non-Union Tonnage Becomes Easier to Sell

Stocks Still Heavy, but Demand Is Improving — Volume of Lake Coal Reduced by Strike—Union Ties Up Some Open-Shop Mines.

CURRENT demand is a little improved, but is held in check by the heavy stocks in hand. Non-union receipts are smaller than anticipated, but the dearth of orders is such that this limited tonnage is still hard to place. The volume of Lake coal has been reduced by the strike, although there are many non-union mines shipping to the lower ports and forty boats are under load. Not much vessel movement is expected before May 1.

Union organizers have succeeded in tying up a number of mines in open-shop districts. Quotations have risen on forward business and sellers are becoming extremely cautious about making large commitments. A stiffening market is at hand. The defection in the non-union miners' ranks is affecting the operations of steel mills.

PITTSBURGH

Interest in the coal situation is transferred from the Pittsburgh district to the surrounding non-union fields. In Westmoreland County there are some non-union strikes, but not many. The old basin of the Connellsville region is not greatly affected, but more than half of the capacity in both coal and coke of the lower Connellsville region is shut off. Along the Monongahela River the strikes are practically complete. The Steel Corporation is taking very active steps to resume production. It has posted notices to strikers to return to work at once, otherwise they will be discharged and their places filled.

Prices on Pittsburgh coal disappeared at the beginning of the strike and since then there has been no quotable market. Westmoreland producers marked up their previous prices 25c. In the Connellsville region, where prices had declined more than 25c. during March, on account of the slump in demand, asking prices advanced 25c., but there has been little demand, while offerings have decreased and there is no regularly quotable market in the Connellsville region for either Sewickley or Pittsburgh vein.

CLEVELAND

The market remains at a standstill. The strike has had no perceptible effect upon the situation as yet. No important increase in inquiries is expected to develop within the next 30 days. The drain on non-union production has been extremely light to date, and it is not expected to begin until present stocks are exhausted. The feeling is quite prevalent that the strike may be broken by settlements in separate districts. This would result in a gradual crumbling of the strike.

In the meantime industrial users continue indifferent. They have stocks to last from six weeks to two months. Until this coal is used up they are not going to place any orders. They are certain that wage and freight rate reductions will bring lower coal prices. Operators themselves freely entertain the idea that coal prices are higher than they should be. The only solution for this impossible situation is lower wages.

Such non-union coal as is coming is higher than the regular No. 8 coal, but the difference is entirely due to greater freight charges and not to any stiffening of quotations. The strike has interrupted the movement to the Lake. Some non-union coal is moving to these destinations, however. About 40 boats have been loaded and are ready for the word to start. The strike probably will seriously retard the Lake movement at the beginning of the season, but a spurt is expected to follow later.

BUFFALO

Production has not been as large as was anticipated, as non-union mines in many instances have not started up, either because of a shortage of orders or of help. In districts where both union and non-union mines are located, employees of the latter may stay away from work for a time at least.

The stories about rumored arrangements among certain small operators to boost prices immediately, and of non-union miners flocking over to the union, may be worrying members of the trade, but they are not disturbing consumers. The past week has seen few orders placed and scarcely any inquiry. Concerns who have been bringing in consignment coal have not been able to dispose of it readily.

Prices are uncertain, some operators claiming that they are unwilling to sell at less than a 10c. advance over the figures of last month. Nevertheless, much coal is to be had without the payment of any premium. Good coal is a little firmer at $2.85 for Westmoreland, gas lump. $2.50 for Pittsburgh and No. 8 steam lump, $2.25 for Allegheny Valley and other mine run and $1.60@$1.70 for slack, adding $2.36 to Allegheny Valley and $2.51 to other coals, to cover freight.

DETROIT

Very little interest is manifested in the coal market. The volume of sales has not been increased by the strike. Quite a number of large establishments have reserves of moderate proportions. Others are expecting continuance of their fuel supply from the unorganized mining sections.

Household demand has fallen off with the coming of moderate temperatures. Most of the retail dealers are well supplied with stock and are buying no more.

Smokeless lump and egg is quoted $2.75@$3, mine run is $1.85, nut, pea and slack, $1.50. Four-inch lump from West Virginia or Kentucky is $2.25, two-inch lump and egg, $2, mine run, $1.40, nut, pea and slack, $1.35. Practically no Ohio coal is now coming to Detroit.

EASTERN OHIO

Early closing of many mines during the week ended April 1 in preparation for the strike brought about a marked slump in the output. Production was 336,000 tons or about 64 per cent of five-day capacity. This unexpected closing was superinduced by the inability of markets to absorb output at the ratio of preceding weeks.

Cumulative figures for the calendar year indicate aggregate production of 4,638,000 tons, and when placed against the potential capacity of 7,792,000 tons for that period results in a ratio of 59.5 per cent production for the year.

Dwindling operations during the pre-strike week tend to verify the assertion previously made that all quarters would enter the period of uncertainty with an abundant supply of reserve fuel, and consequently there should be no apprehension as to coal supplies throughout this section for some time to come.

Most all operations finished the week with moderate quantities of unbilled coal on track for which it is said there has been little demand. Inquiries are negligible and aside from a scarcity which has developed in slack, accompanied by a stiffening in the price of that grade from $1.65 to $1.90, there is little, if any change in the spot prices on other grades. Some small quantities of distress coal on hand at destination unsold, with demurrage charges accruing thereon, have been sacrificed at ridiculously low prices.

The present status of the market is not surprising in view of storage activities during the past 60 days, resulting in the situation that April business was done during February and March. Receipts of bituminous coal at Cleveland during the week ended April 1 displayed no stipulation. The total amounted to 1,311 cars, divided 967 to industries and 342 to retail yards.

COLUMBUS

With mines tied up the coal trade is quiet in the extreme. One or two stripping mines were operated for a day or two but these were stopped to avoid trouble. No untoward incidents were reported during the first week.

Even in the face of the strike, there is practically no demand. Some non-union fuel is coming in, but on the whole this was purchased before the strike became effective. Stocks are sufficient for two or three months on the average and as a result little suffering is expected. Dealers have sufficient coal and are making reductions to move it. A well-known dealer advertises Hocking lump at $6; West Virginia splint lump at $6.75 and Pocahontas at $7.50. Steam demand is rather quiet as most users have sufficient reserves.

NORTHERN PANHANDLE

This is a part of the Ohio district but as many mines have been operated on a non-union basis production was continued in part after the strike call. There is not a particularly active demand, except for railroad fuel. Consignments continue to be made largely to Western and Northern markets.

Cincinnati Gateway

Upward Trend in Prices Sets in Following Strike

Heavier Orders from Tidewater and North and West Forces Smokeless Screenings to Level of Mine-Run—Kentucky Mines Very Active.

THE first upward trend in prices since the strike was started occurred last Monday. Steadily increasing orders from Tidewater for smokeless and better buying from the North and West for bituminous and heavier buying by byproduct and steel plants caused Pocahontas and New River screenings to reach the same level as run-of-mine.

This offsets a further softness to the domestic market. Logan County and Thacker high-volatiles also showed strength on run-of-mine and the price on slack was advanced. There has been practically no change in the Elkhorn or the Big Sandy figures. Hazard operators are quoting slight advances on slack and run-of-mine. There is no interference here to the flow of coal and no great dent shown in the accumulation noted last week.

LOW-VOLATILE FIELDS

New River and the Gulf

There are many New River mines which have closed since the strike call. There is little activity in the market and it is almost impossible to move prepared grades at all. Inquiries are a little more numerous, however.

Gulf mines have not suffered much production loss as a result of the strike, although claims had been made that non-union miners would respond to the call for a strike. Production continued at the rate of more than 65 per cent of capacity with about 6,500 men at work. The bulk of the output is moving to Tide. Prices are still extremely low. Prepared is hardest of all to move. Nut and slack are in fair demand.

Pocahontas and Tug River

There was no cessation of operations in the Pocahontas field on the first of April. Fully 15,000 men were at work on the first day of the strike and production was approximately 60,000 tons.

Heavy loadings in recent weeks have been more than the market could absorb as a consequence of which much coal is being held for consignment at terminals. Producers are confident that as the general supply available in the market is reduced, no trouble will be experienced in handling all the coal produced. Tidewater inquiries are on a larger scale but prices in all markets are extremely low.

Fully 5,000 Tug River miners continued at work and were producing coal at the rate of about 15,000 tons a day during the first few days of the strike. There was a brisk demand for byproduct coal but in general the market was sluggish. Prices continued on a low level especially on lump.

HIGH-VOLATILE FIELDS

Kanawha

Only about 12 mines were working on the first day of the strike but operators believe that more will be in operation before the strike is very old, since a number of miners have signified their intention of going to work. There is little or no market at the present time. With a new scale in effect, such companies as are able to operate expect to secure business which has heretofore been beyond their reach.

Logan and Thacker

No perceptible difference was made by the strike in the Logan field where all the miners were at work as usual. Production has been maintained at about 50,000 tons a day. The light spot demand was limited to steam coal, prepared being almost unmarketable. Even steam grades were low in price.

Thacker production was being slightly increased, all of the men being at work during the first few days of the strike, notwithstanding the claims of the United Mine Workers that there would be a general suspension of operations on April 1. Although there is not a strong spot demand yet much coal is being moved into Western markets in addition to the large tonnage supplied for railroad use.

Northeastern Kentucky

At one or two points only was there any suspension of operations. Although there are a few locals in this field the union has never been recognized. Production is continuing at the rate of between 130,000 and 140,000 tons a week. There is not a particularly strong demand, however, even for steam coal, but the mines since have been able to secure a number of contracts on which deliveries are now being made.

CINCINNATI

Smokeless prices are equalizing themselves. Portsmouth again shows an accumulation of lump and egg that has neared the danger point and a general cut followed. Not alone this but cars in distress or on demurrage were thrown on the market at a concession that brought the lump in close contact with that which is being paid for bituminous. About the only make of the low-volatile that had strength was the screenings and this was through an increased buying demand from the byproduct and steel plants to the north in Ohio.

The call for domestic coal being practically over there were general price reductions by the southeastern Kentucky and Virginia operators. Run of mine too was weaker, although not so much reflected in the prices at which the wholesalers were taking tonnage. One big screenings contract is said to have been signed for the coming year for 50,000 tons of Elkhorn at $1.25 with 150,000 tons more wanted at the same figure.

Retail prices show little or no change, even with the fall that some of the prepared sizes have taken. Retail prices are: Smokeless lump $7.25@$7.50, mine run $6.50; bituminous lump $6.25@$6.50, slack $4.50.

SOUTHEASTERN KENTUCKY

The strike is having little effect here. Nearly 90 per cent of the mines that were running prior to the strike are still operating and so far as can be learned are having no trouble in doing so. The few men that are out are gradually drifting back. At a large number of mines, especially on Martins and Catrons creeks in Harlan County all employees reported for work on April 3.

The biggest worry the operators are having is finding a place to ship their coal. There is practically no demand for either steam or domestic and prices are weak.

West

SALT LAKE CITY

The strike is having no noticeable effect upon the coal business in Utah. People simply decline to take the matter seriously because more than 80 per cent of the state's normal coal output is being produced regularly, and it is generally said that those men who are striking are looking for a chance to go back to work in spite of agitators who are active. A brief spell of colder weather has given the retail trade a marked stimulation.

DENVER

Reports here indicated less coal on hand April 1 than on the first day of the year, but the strike is only 65 per cent effected in Colorado and industries and householders throughout the state think they can get along for some time under the conditions.

Industries other than steel and coke have 52 days' supply; retail dealers in bituminous coal, 15 days; electric utilities, 18 days; and coal gas plants, 31 days.

Railroads have been stocking up for several weeks. The Denver & Rio Grande Western has 10,000 tons at Grand Junction, enough for from 60 to 90 days.

Prices are unchanged, and with warm weather coming suddenly, as it has, there is no great demand for coal.

KANSAS CITY

Coal operators in the Southwest fields are marking time and trying to dispose of the thousands of cars of coal they have on the tracks at the mines, but both steam plants and yards are heavily stocked. If by some miracle the strike was terminated to-day, the Kansas mines could not operate for some time on account of the accumulation.

The Industrial Court of Kansas has taken no further action but it has stated that as soon as the people of that state are in need of coal the mines must operate; just how it will bring this about is not clear.

News From the Coal Fields

ALABAMA

George B. McCormack, president of the Pratt Consolidated Coal Co. and a pioneer in the coal industry of Alabama, resigned as executive head of the company and was elected chairman of the board, at a recent meeting of the directors. Mr. McCormack has not been enjoying the best of health for some time and desired to relinquish the arduous duties of his position to the direction of younger blood. **Carr McCormack**, son of the retiring head of the company, was elected to the presidency. He is president of the Daniel's Creek and New Castle Coal companies. The Pratt company is the largest independent producer of commercial coal in the South.

The Moffat Coal Co., St. Louis, has announced the purchase of an initial tract of 1,400 acres of what is understood to be the Cahaba vein near Blocton, on a branch line of the Mobile & Ohio. At the present time the company is driving two slopes and expects to be producing by the first of June. The Moffat Coal Co. is one of the pioneer operators on the Mobile & Ohio in Illinois and this venture is the first made by any St. Louis operator toward locating mines in the non-union fields of the South.

ILLINOIS

The following April itinerary of the **Illinois Miners' Examining Board** has been announced: Belleville, April 17; Harrisburg, April 18; Herrin, April 19; West Frankfort, April 20; Duquoin, April 21; Centralia, April 22; Gillespie, April 24; Springfield, April 25; Pana, April 26; Danville, April 27; Peoria, April 28 and La Salle, April 29.

Leslie Mullen, Chicago, has been made vice-president of the Fidelity Coal Co., of that city. He was at one time vice-president of the Victory Coal & Coke Co.

W. E. Rutledge, of Chicago, president of the Security Coal & Mining Co., of Chicago, was a visitor at the company's operations the last week in March. The concern operates mines at Livingston and Duquoin.

The O'Gara Coal Co., with headquarters in Chicago, has appointed **Walter L. Ballou**, editor of *The Black Diamond*, its advertising manager. The company expects to enlarge its service to retail customers by offering them all sorts of dealer helps.

C. M. Wasson, president and general manager of The Wasson Coal Co., has returned after three months in Florida.

The Peabody Coal Co. has offered all of its headquarters employees at Chicago three weeks' vacation, instead of two, provided they will take it in April. The company counts on being prepared after April for almost any sort of developments in the coal trade.

INDIANA

Koreans shot and killed **Mrs. W. J. Snyder**, of Brazil, in Shanghai, March 28, as she was stepping off a passenger liner. They were shooting at Gen. Giichi Tanaka, former Japanese minister of war. Mrs. Snyder was the wife of W. J. Snyder, vice-president of the American Coal Mining Co. Mr. and Mrs. Snyder were on a tour of the world that was to have continued for two years.

Wm Schrolocke, head of the Schrolocke Coal Co., Indianapolis, is busy closing out the affairs of four coal companies which have been placed in his hands as receiver during the past few months. He has announced that creditors of the **Metropolitan Fuel Co.** must file their claims against the company on or before April 15. The same date is fixed for the final filing of claims against the **Linton Collieries Co.**, **The Rose Hill Coal Co.** and the **Dana Coal & Mining Co.**

IOWA

The O'Gara Co. has appointed **L. W. McKown** as district sales manager for Iowa. Mr. McKown will maintain offices in the Putnam Bldg., Davenport. He has represented the O'Gara company in Iowa for the past three years.

J. F. Barret has struck a vein of coal near Hamburg. He expects to be taking out coal within thirty days.

KENTUCKY

The Diamond Jet Coal Co. has filed suit in Louisville against the **Southwestern Fuel Co.**, for $429.15.

Joseph Wisher, treasurer and general manager of the Consumers Coal & Supply Co., Covington, was stabbed late in March. Thomas Moore, railroad switchman, was placed under arrest in connection with the stabbing, which it was reported grew out of an argument over removal of railroad ties from the yard. Wisher is in a serious condition, but is expected to recover.

W. H. Bradford, of the Louisville office of the Dixie Fuel Co., of Nashville, has returned to Nashville and gone with the Fentress Coal Co., in which his father is interested. **C. W. Logan**, of the Nashville office has come to Louisville, where he will be under **Harry McBratney**, manager of the Louisville division of the Dixie.

T. S. Petry and others of Hazard have purchased the plant of the **Duane Coal Co.** at Duane on Lotts Creek, and will resume operations of the mines at once.

The coal trade in Louisville, with the exception of some of the small retailers, is disappointed over the fact that a proposed ordinance, including **a coal licensing measure**, was postponed by the city council recently, the general ordinance being passed, with the coal section cut out. This section provided for an annual license fee on all retailers of $500 a year, and of $100 a year for jobber or broker. Large retailers are for the measure, and some time ago endorsed such a plan in the Coal Retailers Division of the Louisville Board of Trade. Their argument is that the snowbirds and small retailers are spoiling business, and that when the large retailer stocks up in the fall to take care of emergency demand, the snowbirds take advantage of every drop in mine prices to undersell the retailer who is carrying stock for protection.

NEW YORK

Lucien Hill is now connected with the Tuttle Coal Corporation, 52 Broadway, New York City, in the capacity of sales manager with jurisdiction over the North Atlantic and New England States. Mr. Hill was manager of Eastern sales for the United Coal Co., for ten years, and recently was sales manager of the Wright-Gibson Co., Pittsburgh, with offices in New York City.

The Jones-Koblegard Coal Co., of Clarksburg, W. Va., has been renamed the **State Coal Co., Inc.**, R. M. Jones, president, John Koblegard, Jr., vice-president and treasurer, J. W. Grant, vice-president, and H. L. Robinson, secretary. The Philadelphia office has been discontinued and New York City quarters opened at 50 Church St.

J. C. Meyerhoff has become associated with F. B. Gerhardt, of No. 1 Broadway, New York City. Mr. Meyerhoff, who is well known among the coal trade, will look after the local and nearby business.

E. E. Loomis, president of the Lehigh Valley R.R. Co., has announced the establishment of a group insurance policy covering more than 2,000 employees of the railroad. The policy represents an aggregate amount of insurance of about $50,000,000 and is for both life and accident protection.

Recent incorporations of coal concerns in this state to transact business in Manhattan include the following: **D. L. Flack & Son**, to deal in coal, wood and ice with a capital of $175,000. The incorporators are W. P. Anderson, W. F. Woods and A. B. A. Bradley. **McNeil Coal Co.**, capital $200,000. The incorporators are L. A. Corya, A. Hugo and K. W. O'Neil.

Soon the Buffalo coal men will give attention to the annual golf tournament, for which the **Weaver Coal Co.** offers a silver cup to the best player among those participating.

The firm of **E. L. Hedstrom** has been awarded the contract for furnishing smokeless coal to the 106th Artillery Armory, Buffalo, for the coming year.

OHIO

William A. Colston has been named general counsel and vice-president of the Nickle Plate R.R. He will take charge of his new work at Cleveland May 1.

The Combustion Engineering Corporation announces the opening of a branch office at 1137 Guardian Bldg. Cleveland in charge of Frank Henderson.

Calvin R. Holmes, general sales manager of the Blue Diamond Coal Co., broadcasted a speech by radio to the Southeastern coal merchants' meeting in Atlanta, Georgia, on the evening of their first day's session. This, so far as is known, is the first speech on coal topics, made through space.

A big merger of the so-called independent mines of the Hazard district is being worked out. It is understood that some twenty-eight mines may be acquired and that most of these are of large capacity. Frank Ray, well-known mining engineer of Columbus, is at present in the Hazard district making a survey of their potentialities and an appraisal of the equipment so that these can be worked out into a general plan for a merger. Among others interested are: **Jewett, Bigelow & Brooks**, **Columbus Mining Co.**, and **Daniel Boone Coal Co.**

OKLAHOMA

A situation similar to that of a new oil field or a new gold field is found in the recently discovered coal field on the Oklahoma-Kansas border. The race is on now for the gate city to this field, which is the largest in the United States west of the Mississippi River. Vinita and Miami in Oklahoma, Coffeyville, Parsons, Chetopa, Altamont, Edna and Cherryvale in Kansas are all contending for this business. The Missouri, Kansas & Texas is surveying from Chetopa south 15 miles in the heart of the new field. The Frisco has surveyed a line from Vinita, Okla., to Blue Jacket, Okla. Operators are taking leases at high figures and more than $5,000,000 has been reported paid out in leases last year. The vein measures over 5 feet.

PENNSYLVANIA

The Central Union Trust Company of New York has filed a brief in the Supreme Court in the suit of minority stockholders against the decree of the district court in the dissolution of the **Reading Coal Co.** case. It requests that the decree of the lower court be affirmed.

The American Connellsville Fuel Co. has been organized to operate the La Belle coke plant recently purchased from the **La Belle Coke Co.** The officers of the new company are R. M. Fry, president; W. Russell Carr, vice-president, both of Uniontown, and John J. O'Connell, of Pittsburgh, secretary and treasurer.

A cave-in occurred on the road between Pottsville and St. Clair, at a point half-way between the Pennsylvania R.R. tunnel and East Mines. As a result the road was closed from both ends, and traffic forced to detour by way of Mill Creek. The fall is thought to have been into one of the breasts of the old Chamberlain workings, which are known to extend in that direction.

The Fulton Steam Coal Co., consisting largely of Youngwood capitalists, has taken over the holdings of the **Scottdale Coal Co.** on the Yukon branch of the Pennsylvania. The holdings of the purchasers now aggregate 950 acres of coal.

J. M. Black and C. F. Roy, of Somerset, have just closed a deal for 526 acres of "C" Prime and "B" vein coals in Quemahoning township. The mine is located at Rowena station, on the Somerset & Cambria branch of the B. & O. A company has been formed under the name of **Blackroy Quemahoning Coal Co.**

The Carbon Coal Co., Jackson, capital $120,000, has filed charter papers, the incorporators being Emory Cain, Henry L. Spencer and Ben C. Sewell.

Derby, Harris and Good, engineers, wish to announce the opening of their offices at 908-9 Mears Bldg., Scranton. Members of the firm are: Fred K. Derby, H. E. Harris and Frank Good.

The Iron Trade Products Co., with offices in New York City and in Pennsylvania, announces the appointment as sales manager of its coal and coke department of **Ralph M. Hamilton**, who has resigned as sales manager of the Jefferson Gas Coal Co. to accept this new position.

Two men were recently killed in the Woodward Mine of the **Glen Aden Coal Co.**, at Edwardsville. The necks and the backs of both of the men were broken and they must have been instantly killed. The accident was not discovered immediately and it was not until the men had failed to return to their homes that a search was commenced.

Total production in the **Twelfth Anthracite District** reached 4,527,194 tons in 1921. This figure represents an increase of approximately 500,000 tons over the production in 1920. The district includes Kingston, Edwardsville, Larksville, Plymouth borough and a portion of Plymouth township.

The secretary of state has issued a charter to the **Acme Coal Co.**, of Shinnston, capitalized at $50,000. The incorporators are: L. C. Crile, A. M. Leonard, of Clarksburg, George W. Simpson, Johnstown, Basil H. Lucas and T. W. Brockman of Shinnston.

Increases of capital stock have been authorized by the following coal companies, according to notices filed at Harrisburg: **Keystone Coal & Coke Co.**, $2,500,000 to $7,500,000; A. N. Pershing, treasurer, Westmoreland County; **Lumated Mining Co.**, $100,000 to $150,000; George H. Lum, treasurer, Clearfield County; **Pioneer Coal & Coke Co.**, $25,000 to $500,000; Charles F. Colbert, vice-president, Allegheny County. **The Cardiff Coal Co.** will increase its indebtedness from nothing to $4,000,000; A. N. Pershing, treasurer, Westmoreland County.

Production in the **Second Bituminous District** was 2,514,669 tons less in 1921 than in 1920. The district produced 1,455,556 tons less coke last year than in 1920. In 1921 4,021,474 tons of coal were mined and in 1920 6,536,146 tons. In 1921 the production of coke amounted to 377,041 tons and in 1920 it was 1,832,597 tons.

Production in the **Second Anthracite District** reached 3,221,669 tons during 1921. There are thirteen collieries with thirty-one mines operated by ten companies in the district, and all of these are in operation.

The Lehigh Coal & Navigation Co. will drive a 1,000 ft. tunnel to reach new levels in the No. 11 mine.

Effective April 1, headquarters of the **Coal, Coke and Iron Ore Committee**, Central Freight Association territory, will be at Room 606, Chamber of Commerce Building, Pittsburgh, Pa.

The Pennsylvania State Forestry Department has just had prepared a map showing the forest fires of 1921 and where the greatest fire hazards exist. The greatest hazards are shown to be in the thickly populated sections of the anthracite region, including Luzerne, Schuylkill and Northumberland counties. In the bituminous coal region the Johnstown district is shown as a hazard.

Bituminous coal companies recently granted charters are: **DuBois Coal Co.**, DuBois; capital, $50,000; treasurer, W. H. Rockey, DuBois; incorporators, W. H. Rockey, S. M. Davenport and J. E. Fry, DuBois. **Stineman-Gorman Coal Co.**, Ebensburg; capital, $10,000; treasurer I. E. Lewis, Ebensburg; incorporators, James C. Stineman and I. E. Lewis, Ebensburg, and George F. Gorman, Hartford, Conn.

Effective April 1 the Pittsburgh office of the **Hendrick Manufacturing Co.** will be located in the Union Arcade Bldg.

A. Spates Brady, of Elkins, president of the Brady Coal Co., was attending the Sixth District Rotary convention at Johnstown on March 28 and 29.

The Pennsylvania Supreme Court has given notice that the appeal from the decision of the Dauphin County Court upholding the **Williams tonnage tax act** of 1921, will be argued in Philadelphia, April 17, which is also the date for the appeal from Judge Fuller's decision declaring the Kohler anti-cave law unconstitutional. Attorney General Alter will appear for the State in the tonnage tax case.

TEXAS

Tentative report of **Texas Pacific Coal & Oil Co.** for the year ended Dec. 31, 1921, shows net income of $2,077,519, after charges, depreciation, etc., but before depletion and Federal taxes, equivalent to $2.46 a share (par $10), earned on the $8,448,048 capital stock. This compares with net income of $8,913,946 after Federal taxes, of $4.72 a share, earned on the $8,282,400 capital stock in the previous year. Surplus for the year after charges and dividends was $1,071,520.

VIRGINIA

Representatives of the **Consolidation Coal Co.**, New York, have been in Norfolk making a survey of conditions with a view to opening a branch office. This company has hitherto shipped through New York, Philadelphia and Baltimore, but has purchased 40,000 acres of coal land on the Norfolk & Western, and will likely ship much of the coal from its field through Hampton Roads.

Willard, Sutherland & Co., Inc., announces the appointment as manager of the Norfolk office of **Chester B. Koontz**, and of **Carl W. Blanchard**, as manager of the Newport News office.

The Virginia Coal & Coke Co. has been organized at Roanoke with capital stock of $10,000,000, and has acquired large holdings of coal lands, mines, railways, etc., in Letcher, Harlan, Perry and Pike counties, Kentucky.

The Little Lick Coal Co., Inc., Staunton, with a maximum of $100,000 and a minimum of $15,000, has been granted a charter to mine and deal in coal and other minerals. The officers and incorporators are Hugh B. Sproul, president; John Stott, secretary, and A. Erskine Miller, all of Staunton.

WEST VIRGINIA

Adhering to his former statement that coal acreage in Monongalia County must stand the same proportionate increase in assessment as is being placed on other property, **County Assessor E. E. White** states that nothing can come out of a conference between himself and the owners of coal acreage until after his reports have been submitted to the board of equalization and review.

The Supreme Court of West Virginia has granted a writ of error to the plaintiff in the case of Mike Kirchaski against Lon Smith and others, appealed from Taylor County. Kirchanski sued in the circuit court of Taylor County for $100,000 damages for injuries sustained financially and physically from members of the miners' union. He alleges that the latter threw him out of a union meeting, boycotted him and caused injuries resulting in the amputation of his leg.

One of the original J. V. Thompson tracts in Cass district of Monongalia County has changed hands. This covers 286 acres of coal land which has been transferred by the **Ayrshire Corporation** to **Andrew M. Linn**, of Washington, Pa., for a consideration said to be about $130,000.

Since the destruction of the old tipple of the **Ashland Coal & Coke Co.** by fire a few weeks ago that company has been busily engaged in pushing construction work on the new tipple of the company.

There is now under construction at Amherstdale for the **Proctor Coal Co.** in the Logan County field, a store building, a part of which will be for office use, and to contain a store room, the office of the store manager, payroll office and the office of the superintendent. The Proctor company has of late been increasing its working force and the new building has become necessary in order to accommodate the larger number of employees of the company at Amherstdale.

The proposed merger of the coal mining properties of the **Cardiff Smokeless Coal Co.** with those of the **Harry B. Coal & Coke Co.** continues to be tied up in the district court of the northern District of West Virginia, a hearing having been held before Judge W. E. Baker on April 1. The hearing was upon a temporary restraining order awarded by Judge Waddell of the U. S. Circuit Court, returnable before Judge Baker on April 1. Minority stockholders, headed by Charles H. Diffenderfer, of Philadelphia, oppose the merger. Without indicating his holding on the motion for an injunction, Judge Baker continued the temporary restraining order for ten days. The controversy arises over a million dollars worth of coal properties in Harrison, Marion and Preston counties.

J. T. Wilson, one of the prominent operators of the Tug River field, with headquarters at Bluefield, spent the latter part of March in New York, returning to Bluefield about April 1.

The Emmons Coal Mining Co., operating at Bayard, and its employees, have negotiated an agreement on a new scale, the miners having withdrawn from the United Mine Workers organization and having formed an independent organization. The scale was suggested by the employees and accepted by them after a conference with officials of the company. Rates now in effect are as follows: Pick mining, 80c. per ton; machine loading 51c.; cutting and scrapping, 11c. Day labor: Cutting, 55c. per hour; scrapping, 50c.; motormen, 54c.; brakemen, 50c.; drivers, 50c.; car grabbers, 50c.; trackmen, 53c.; trackmen helpers, 48c.; weight boss, 52c.; tipplemen, 45c.; blacksmiths, 54c.; repairmen, 54c.; all other work, 45c.

Everett Drennen, president of the West Virginia Coal & Coke Co., returned to his headquarters at Elkins early in the month after a business trip to New York.

WISCONSIN

The Milwaukee Coke & Gas Co. has discontinued its general offices in the First Wisconsin National Bank Bldg., and the affairs of the company will now be administered at the offices connected with the byproduct plant on Greenfield Ave., Milwaukee.

BRITISH COLUMBIA

The Canadian Government Merchant Marine Ltd. has several freight vessels plying out of Vancouver and other British Columbia ports. Of late these ships have returned from Australian ports carrying coal, in some cases enough to supply fuel for the return voyage. The Vancouver Island collieries are complaining of this practice. They have represented to the Dominion Government that the branches of their service should be the first to stand by the principle of patronizing home industry. It is stated that if the island mines could depend upon getting the business of bunkering these Government ships it would make the difference between operation part-time and working at capacity. The authorities are understood to have agreed to give these representations serious consideration.

OUTPUT FOR FEBRUARY, 1922

Mine	Tons
Vancouver Island District	
Western Fuel Corporation of Canada, Ltd., Nanaimo	56,313
Canadian Colliers (D) Ltd.,	
Cosmox	30,360
Extension	18,962
South Wellington	7,630
Granby Cons. M.S.&P. Co.	23,987
Nanoose Wellington Collieries	8,624
Old Wellington (King & Foster)	536
Total	146,413
Nicola-Princeton District	
Middlesboro Collieries	6,653
Fleming Coal Co.	3,007
Coalmont Collieries	10,081
Princeton Coal & Land Co.	2,064
Total	21,805
Crow's Nest Pass District	
Crow's Nest Pass Coal Co.,	
Coal Creek	40,898
Michel	30,879
Corbin Coal & Coke Co.	5,645
Total	77,422
Grand Total	245,639

NOVIA SCOTIA

The wage dispute between the **British Empire Steel Corporation** and the miners has come up for consideration in the Dominion Parliament, in consequence of the action of the executive of the United Mine Workers in ordering the men to "strike on the job," with a view of limiting the output below the profit level. This move was strongly condemned by Premier King and James Murdock, minister of labor, and the order was generally disregarded by the miners. About 60 men who were loafing at their work were discharged. The Dominion government has decided to reconvene the Conciliation Board for a new hearing of the case and the offer has been accepted by executives of the United Mine Workers.

ONTARIO

J. P. Bickell, president of the Blue Diamond Coal Mines, controlled by the McIntyre and Timiskaming Mining companies, has just returned to Toronto after a visit to the property in British Columbia and states that the mine continues to operate. While the mine has instituted open shop, efforts were made to persuade miners to walk out on April 1, and while some of the workers laid down their tools the majority of them are at work.

G. H. Merryweather, secretary-treasurer of the American Wholesale Coal Dealers' Association, Chicago, was a recent caller in Toronto.

WASHINGTON, D. C.

While the Senate increased the **appropriation for geological surveys** to $352,000 for the next fiscal year, the House insisted that there be no increase from the $300,000 which was the amount approved by that body. While $300,000 is the amount which has been appropriated for geological surveys during the last ten years, that amount of money does not buy as much in the way of field work as it did ten years ago. In addition, there are urgent demands for geological work at this time due to the fact that work in the metal mining camps and in the oil fields was stopped during the war so as to concentrate attention on special war demands.

The United States Civil Service Commission announces an open competitive examination for transitman on May 10. At least ten vacancies in the General Land Office Service, and vacancies in positions requiring similar qualifications, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The deficiency bill passed by Congress and made a law by approval of the President makes available $6,282,685 for fuel for the Navy; $39,812 for fuel for public schools in the District of Columbia; $4,000 for fuel for the postoffice department; $150,000 for fuel for the Coast Guard, and $650,000 for fuel for public buildings.

Coal operators in the East will probably lose considerable business if the Navy Department concentrates the battleship fleet on the Pacific coast, which is said to be in contemplation by Secretary Denby to meet the situation caused by the radical reduction in Navy personnel proposed by the House Appropriations Committee. At present the Navy maintains coal burning ships on the Atlantic coast and oil burners on the Pacific, as an economy measure to save the transportation of oil or coal needed for the vessels.

A new major subdivision has been created in the United States Geological Survey by raising the **division of Alaskan mineral resources** to the status of a branch. Heretofore the Alaskan work has been a subdivision under the Geologic Branch. The work will continue under the immediate direction of Colonel A. H. Brooks, whose title under the rearrangement is Chief, Alaskan Geologist.

Traffic News

The I. C. C. **has decided that the proposal of the railroads to reduce rates on bituminous coal** from mines on the Missouri Pacific in southern Illinois to points in Arkansas, Louisiana and Texas is not unreasonable and has vacated its suspension of the rates which will go into effect April 23.

The commission has suspended until July 20 the proposal to increase rates on slack coal from Sheridan, Wyo., districts to Crawford, Neb., and other stations on the C. B. & Q. by amounts varying from 10c. to 71c. per ton.

The Ohio & Kentucky Ry. has filed a protest with the I. C. C. asking that the Louisville & Nashville be required to allow the complainant not less than 50c. per net ton of bituminous coal from mines on its line to O. & K. junction.

Freight interchanges between railroads at Lockport, N. Y., are much wanted by shippers, as well as by coal dealers there, and a hearing on the subject has been given by the I. C. C. A similar interchange is desired at Batavia, N. Y., but a Court of Appeals order relieves the railroads from carrying out the plan.

In the complaint of the **Boise Gaslight & Coke Co.**, the I. C. C. holds that the rates on mine run from Sunnyside, Utah, to Boise, Idaho, are not unreasonable.

After investigation the commission has decided that proposed reduced rates on bituminous coal from points on the C. & O., in eastern Kentucky and West Virginia, and from districts in northern Tennessee, eastern Kentucky and southwestern Virginia on the L. & N., to points west of Louisville, on the St. Louis division of the Southern Ry., in Indiana and Illinois, and to St. Louis are justified. The commission has vacated its order suspending these rates and will allow them to take effect April 22.

The commission has decided that the rates on bituminous coal from points in Indiana and Illinois to Chicago during Federal control were reasonable.

The commission has decided that the divisions accorded the **Marion & Eastern** R.R. out of joint rates on coal from mines on its lines to points in Iowa, Wisconsin, and Nebraska, were not unreasonable.

The I. C. C. has refused to allow the railroads to reduce the rates on coal from mines in the Rock Springs and Kemmerer districts in Wyoming to points in Utah, south of Ogden, on the Oregon Short Line R.R. and its connections. The purpose of the reduction was to restore a previously existing equality in the rates to the destinations in Utah from the Wyoming mines and from the Castle Gate district of Utah.

The E. I. DuPont de Nemours & Co., of Wilmington, has complained against unreasonable rates on anthracite coal from Hudson, Pa., to Pompton Lakes, N. J.

In the complaint of the **Midland Coal Co.**, the commission decides that the rates on coal from Williams, Okla., to Kansas City, Mo., in 1916 and 1917 were not unreasonable.

Deciding the complaint of the **National Supply Co.**, the commission holds that the rates on coke from Terre Haute, Ind., to Coburg and Fontanelle, Ia., and Adams, Neb., are not unreasonable.

The I. C. C. **has assigned for hearing** April 22 at St. Louis the case before it involving reduced rates on coal from Illinois mines on the Illinois Central to Arkansas points on the St. Louis Southwestern R.R.

In the complaint of the **J. L. Mott Co.**, an examiner recommends that the petition of the company for through routes and joint rates on bituminous coal via the B. & O. and Pennsylvania from mines on the B. & O. in West Virginia to Trenton, N. J., be denied.

The I. C. C. has assigned for further hearing May 15 at **Salt Lake** the complaint of the **Cameron Coal Co.** and others vs. the A. T. & S. F.

In complaints to the I. C. C. the **Northern States Power Co.**, of Minneapolis, and **John Morrell & Co.**, of Sioux Falls, S. D., allege unreasonable rates on fine coal from Illinois, Indiana, and Kentucky.

Dewey Bros. Co., of Blanchester, Ohio, in several complaints alleges unreasonable rates on coal from West Virginia and Kentucky, to Ohio points.

The complaint of the **Northwestern Pennsylvania Coal Operators' Association** will be heard at Pittsburgh, April 26.

The Colony Coal Co., of Denver, has complained against unreasonable rates on coal from Dines, Wyo., to Portland, Ore., and on rates on mine props and ties from Fox Park to Dines.

In the complaint of the **Hood Pottery Clay Products Co.**, an I. C. C. examiner recommends that the rate during Federal control on slack, pea, nut and run of mine coal from Rathbun, Tenn., to Melville, Tenn., was not unreasonable.

In the complaint of the **Pratt Engineering & Machine Co.**, an I. C. C. examiner recommends that the rate on bulk coke from Tupelo, Miss., to Atlanta, Ga., is unreasonable.

Association Activities

Trans-Mississippi Coal Operators' Association

A new coal operators' association has been organized consisting of the producers in Iowa, Missouri, Kansas, Arkansas and Oklahoma. It takes in the old associations known as the Iowa Coal Operators' Association, the Southwestern Interstate Coal Operators' Association and the Oklahoma Coal Operators' Association. This means that they have pulled away from the arrangement that worked so closely with the Central Competitive Field. Indications are that the operators in the new association will negotiate a separate agreement with the miners in their territory and it is likely that this will be done without the presence of Alexander Howat who for seventeen years has been the presiding officer in conferences of the Kansas miners.

The following committee was appointed at the recent meeting to meet with the miners' representatives and work out a basic wage scale:

Iowa—E. C. Smith and J. Norwood, Des Moines.

Kansas—Ira Clemens and C. F. Spencer, Pittsburg.

Oklahoma—D. C. McAlpine, Haileyville; J. C. Reid, McAlester.

Missouri—F. W. Lukins, Kansas City; C. J. Baxter, Kirksville.

Arkansas—H. N. Taylor, Kansas City; M. M. McWilliams, Spadra.

Coming Meetings

National Retail Coal Merchants' Association. Fifth annual convention at the Drake Hotel, Chicago, Ill., May 18-20. Executive secretary, Joseph E. O'Toole, South Penn Square, Philadelphia, Pa.

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

Missouri Retail Coal Merchants Association will hold its annual meeting May 16 and 17 at the Planters Hotel, St. Louis, Mo. Secretary, F. A. Parker, Arcade Bldg., St. Louis, Mo.

American Institute of Electrical Engineers will hold its spring convention at Chicago, Ill., April 19-21. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

National Coal Association will hold its annual meeting at Congress Hall, Chicago, May 24 to 25. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham.

Virginia Coal Operators' Association will hold its annual meeting April 15 at Norton, Va. Secretary G. D. Kilgore, Norton, Va.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 15-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 26 and 27 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Fidelity Trust Bldg., Indianapolis, Ind.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at the Stacy-Trent Hotel, Trenton, N. J., June 7 and 8.

National Safety Council. Eleventh annual Safety Congress at Detroit, Mich., Aug. 28 to Sept. 1. Executive secretary, W. H. Cameron, North Michigan Ave., Chicago, Ill.

Coal Mining Institute of America will meet Dec. 13, 14 and 15 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 911 Chamber of Commerce Bldg., Pittsburgh, Pa.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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Charting the Trade Association's Future

TRADE associations had their innings at Washington last week. Several hundred representatives of these organizations, from all parts of the country and all lines of industry, assembled to confer with the Department of Commerce on the functions and future of the trade-association movement.

Many traveled to Washington to learn how they could maintain "open price" reports and not get into trouble. They were told that this feature of association work is in the "twilight zone" and that the government will not participate, even to publication of results, in such activities. Mr. Hoover was final and emphatic on this point. He did not say that open price reports are illegal or that they are legal, but that they are of doubtful value and open to so grave misuse that any who resort to them hereafter are "skating on thin ice."

Other types of statistics the associations are urged to maintain and the Department of Commerce is ready and willing to help along lines that are clearly not of doubtful application.

"The State, It Is I"

WHEN a French King made the bold declaration: "The state, it is I," there was some truth in the words he enunciated. Today the President and the Attorney General are quite well aware that neither they nor the rest of the Cabinet, no, nor the Congress itself, is the state. So long as law endures, ours is a government of laws and not of men. Some laws may be repealed by Congress, some may be revised by constitutional enactment, but while they last they are enforceable without the action of Presidents, Attorney Generals or Congressional committees and none of these can singly or together absolve even the meanest of citizens from the consequences of violating the law as it stands.

Consequently though all the executives in the nation combine to bring the mine workers and operators together into interstate council they cannot relieve them from responsibility for their actions to the federal courts. For a while it was believed that it was safe to listen to the President and his Cabinet, especially when both were backed almost unanimously by Congress, the press and the people.

The mine workers and operators believed that it was the prudent matter to heed such an appeal. They did so, and then Judge Anderson revealed the fact that all the wishes of all the people were as nothing as compared with the laws on the statute books. We do not know whether his interpretation of the law has validity—that must be left to the superior courts—but this is certain, that the laws and not the wishes of the executives and legislative bodies determine what it is safe to do.

Nor can one be guided by clamor. The cries of the marketplace cannot always be heeded with safety. There is no guide but the law, and there is no certainty of the law till the courts have spoken. The operators have learned their lesson. They are waiting on the court. If the contract so often broken by the mine workers is an offense against United States laws the contract is in that matter against public interest and invalid, and the duty of the operators is so to regard it.

No Time to Mediate

A PHILOSOPHER once declared that there is a time for all things, and while he did not mention arbitration among the many things he specified, it is truly one of those things for which there is a time, as one Henry Ford learned when he sent the message to Europe: "Out of the trenches by Christmas."

This is said because editors of the daily press are quite generally disposed to advocate immediate arbitration of the strike controversy. Some declare that the action of Theodore Roosevelt furnishes both a precedent and a good example. It will be remembered, however, that he waited twenty-three weeks before acting and that, furthermore, the issues involved were not then as large as they are today. Consequently the period of meditation that should precede effective mediation did not have to be so long.

Just now arbitration between mine owners and operators would not bring any nearer the end of the coal strike. Capital, if it agreed to arbitrate, would abide by a decision even if it believed it ill-advised, but the mine worker would not accept an adverse judgment. It is useless to suggest that he be tried out and not condemned unheard, for he has been tried already, many times. In 1919 the Fuel Administration, being recalled to act in an arbitral capacity, provided for an increase of 14 per cent in the mine workers' scale over war wages.

The mine workers would have no such settlement, and so, of course, another method of determining the wage was provided. If an independent arbitrator does not find the mine workers willing to accept his decision, get a board to decide the matter in such a manner that they will accept—thus arguing, President Wilson appointed the Bituminous Coal Commission, which gave an increase of 27 per cent over the war-time wage.

But even this did not please the mine workers. After they had returned to work they got to thinking the matter over. "Only 27 per cent increase above war wages," they cried, "and even that increase not equally distributed!" They went back to work eventually, but only when the day workers had been conceded an increase of $1.50 a day over the $6 set by the commission and $2.50 a day over war wages.

In the end, therefore, the last series of strikes was not settled by arbitration but by private agreement. The issue had been arbitrated twice and had to be fought out eventually by other methods. As a matter of fact the psychology of the two parties was changed by the time the strike ended. The mine workers were just a little less expectant and greedy than they had been, and the long strike, having depleted the coal piles, had raised prices and made the operators not exactly willing to pay more for labor but not so resistant as they had been. In Washington State last year the wages of the men were submitted to an arbitration board, but the strike continued after the award was made.

In Nova Scotia, after a wage-agreement dispute, an arbitration commission was appointed. The mine workers refused to accept the decision which was known as the Gillen award, U. E. Gillen, of Toronto, being the chairman of the commission. Thus repulsed, the British Empire Steel Corporation agreed to meet the men and made a concession to them which a majority of the mine workers' representatives accepted.

The men rejected the new scale by a large majority, however, and, going back to work at the Gillen-award wage, which was all the company would pay, proceeded to "strike on the job" in accordance with the advice of the secretary of the district union. The men decided to reduce their work per day so that it would square with the reduction in their wages. It now has been arranged to recall the Gillen committee and ask it to review its decision. In short, the cards are to be shuffled again. Maybe the mine workers' hand this time will be such that they will be willing to play. If not, another shuffle is in order. The mine workers must have aces, kings, queens and jacks or they do not play. Thus does it happen when a decision is given for which the mine workers have not been prepared. They refuse to accept it. It is not well to try to mediate or arbitrate until there is some hope that the decision will be regarded as final. The union workers have had months of idleness and have suffered much, but they still believe with great conviction that they can resist deflation of their wages. They still refuse to believe their cause cannot win. For this reason their leaders are afraid to counsel a conciliatory course.

Mediation or arbitration can be successful only when its sole function is to make less painful a submission to conditions to which the mine workers will come after long privation to believe is inevitable. So long as they are convinced that they can get all for which they ask, administrators, commissions, arbitration boards and conferences will be but in vain.

How Long Does It Take to Grow Old?

WHEN first erected Marianna was the leading coal-mining plant in the United States, being constructed according to the most advanced plans of its day. The specially designed product of the best mine-equipment houses in the country was installed. The firms that furnished Marianna were among the leaders in mechanical construction for coal mines.

Yet after ten to fifteen years of use this equipment has been found so inadequate that it has been replaced. The tipple has been rebuilt, the fan and hoist have been displaced and from the electrical development installed the company expects to make 50 per cent per annum of profit. Of course that is not 50 per cent on the cost of the product but 50 per cent on the equipment, a much smaller amount.

These facts make one wonder if the factor of obsolescence is put high enough in the coal-mining industry. No one can consider Marianna an exception save in the boldness of its past and present owners. Other plants obsolesce as Marianna has done, but as long as the machinery will turn, whether for profit or loss, it is allowed to go on turning, though the savings of new machinery would pay for its installation within a few years.

Automobile manufacturers, we are told, allow 10 per cent per annum for obsolescence. That is a big figure but altogether inadequate in an industry which has two ways in which to grow old—in the product and in the machinery by which it is produced. When the product changes the machine becomes obsolescent, even if its method of manufacturing the product remains up to date. But this is true also of mining. The sizes of the coal produced change, the degree of cleaning desired varies, the need for power increases or decreases, and when the end sought changes, the means become obsolete perhaps even more rapidly than the machine itself.

For this reason a large fund should be set aside for renewals. Only by the fact that we in America have not been content to wait for a machine to wear out have we kept down our costs. Only because Europe has had in view a half century of use when equipping its plants has it fallen behind in the race. A 15-per cent obsolescence charge would seem justified so long as the present progress continues.

If this is doubted, run over in your head the advances in mining in the last few years: The multivane fan, the electric hoist, the skip, the vibrating screen, the step screen, the rotary dump, the cager, the trip maker and feeder, the storage equipment, the safety hoisting devices, the loading boom, the improvement in box-car loaders, the car retarders under the tipple, the picking table for cleaning each car individually, the sampler, the concentrating table, the thickener, the filter, the flotation cell, pulverizing equipment, the gravity separation tank, the air jig, the storage-battery locomotive, the combination locomotive, dynamic braking, the retarding conveyor, the belt and apron conveyor for the product of one or several mines, the arc-wall coal cutter, the unloading device for mining machines, the coal loaders, the heading machine, the room hoist, the cement gun, the portable compressed-air machine, the coal and rock drills, electric and air-driven, the large stripping shovel, the air-dump car, the electric safety lamp, the oxy-acetylene and electric welders, the automatic starting devices, the automatic reclosing circuit breakers, the bearing thermostats, the centrifugal pump and a number of others.

Some may pass away with time and some have prototypes that predated them, but the industry nevertheless does move and move quickly. Only with a heavy allowance for obsolescence can we keep up with it.

The Leiter plant of the Bell & Zoller Co. as reconstructed well shows what can be accomplished by modernization. When that mine was opened it was regarded as a revelation of mining possibilities. It had for many years labored under the disadvantages of age. With new equipment it is setting new standards of production. Only the owners probably know the loss a retention of the old equipment has cost the company in lowered output and expensive operation. Fortunate indeed are those operators who so keenly realize these facts that they will make the changes which the times demand. With the profits thus increased they look back with regret to the losses which the general conservatism of the industry caused them to suffer.

Fires in Steeply Pitching Southern Anthracite Beds Are Fought With Silt and Water and by Sealing*

Fires in Steep Beds Must Be Extinguished by Flooding with Water from Above—Passageways in Lower Bed with Rock Holes to the One on Fire Are Used to Locate Extent of Conflagration

By J. B. Warriner†
Lansford, Pa.

IN THE Wyoming, or northern anthracite, field the beds are of moderate thickness and the pitches are light, but in the southern anthracite field conditions are markedly different. Here the Mammoth bed attains in places a thickness of more than 100 ft., and the average pitch of the measure is 70 per cent. Furthermore, many of the workings are in areas either gobbed or previously mined over and now being reworked. Most of the fires with which I am familiar have occurred in such places and in some cases a situation already difficult has been further aggravated by rolls or contortions of the measures which have doubled the Mammoth bed upon itself, forming what is known locally as "capped anticlines." Some of the accompanying illustrations show what is meant by this term.

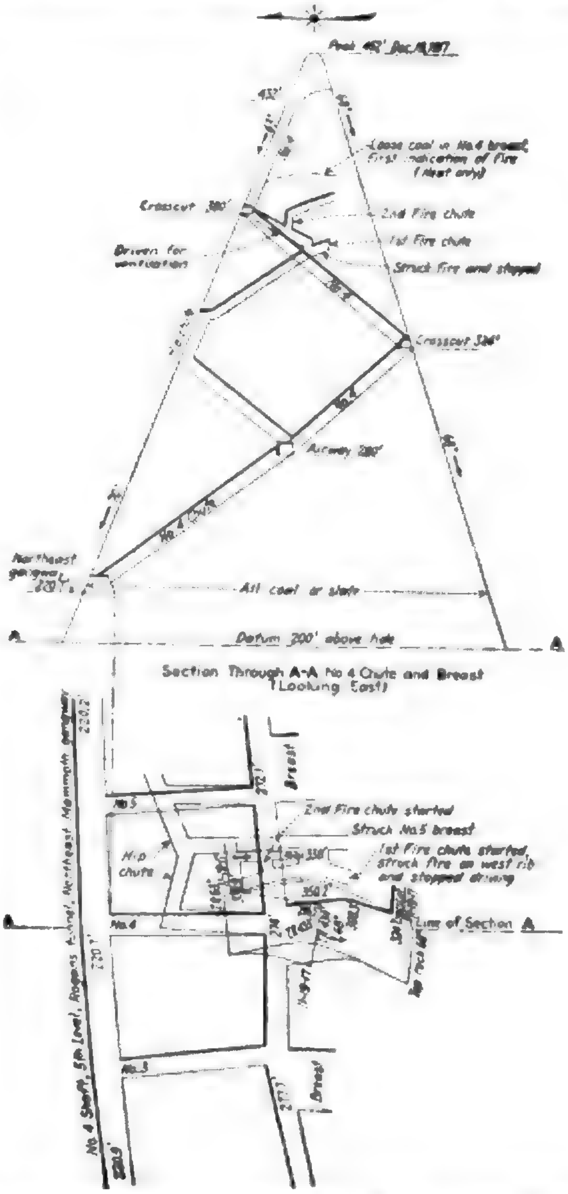
Under the conditions above described the extinguishment of fires by sealing and smothering obviously is practical to only a limited extent. Sometimes sealing is resorted to or used in conjunction with other methods, but the plan finally evolved, after much experience with this type of fire, is to fight it from above by means of water. It must be understood that the fires herein mentioned do not ordinarily break out into a blaze or have the normal characteristics of a conflagration. Rather they are smoldering or creeping fires which, having a limited air supply, advance slowly through the gob and burst into a blaze only at points where an ample quantity of air reaches them. Such fires are often difficult to detect until they have spread over large areas. In recent years the Lehigh Coal & Navigation Co. has employed fire patrolmen to go through the workings each night after the miners are out in an endeavor to locate before it gets any real headway any fire that may have been started.

FIRES START YEARS AFTER PLACES HAVE CAVED

Naturally, many of the fires are of obscure origin. In many instances they are not discovered until years after the completion of the workings in the areas where they occur.

I have stated that the finally accepted method of fighting such fires is to attack them with water from above. This is done either by pouring it in at the crop or from an upper level, or by driving chutes up in one of the small underlying beds and crosscutting by means of rock holes or small tunnels to the big vein above the fire. In any case such passages have to be driven, for only in this way is it possible to explore the fire area thoroughly and determine its extent. Without such exploration it is difficult to feel assured that the fire is entirely out. To do this many yards of chutes, headings and tunnels have to be driven.

To illustrate the methods pursued in fighting mine fires under the conditions outlined, brief descriptions of three such fires will be given—one at the Lansford colliery and one at the Coaldale colliery, both in the main dip of the Mammoth vein, also one at Rahn colliery


Crosscut 380'
Loose coal in No.4 breast. First indication of fire (heat only)
2nd Fire chute
1st Fire chute
Struck fire and stopped
Driven for ventilation
Crosscut 314'
Airway 280'
No. 4 Chute
Northeast gangway 220'
All coal or slate
A
Datum 200' above tide
A
Section Through A-A No 4 Chute and Breast (Looking East)
Breast
No.5
2nd Fire chute started
Struck No.5 breast
1st Fire chute started, struck fire on west rib and stopped driving
Hip chute
No.4
Line of Section A
No.3
Breast
No 4 Slope, 5th Level, Rogans Tunnel, Northeast Mammoth gangway

PLAN AND ELEVATION OF NORTHEAST MAMMOTH GANGWAY, COALDALE, PA.

Off Rogan's Tunnel. The coal which was on fire was on a slope of 45 deg. Tunnels were driven to get above the burning material. An attempt was made to extinguish it by water, but only by the use of silt was the fire ultimately put out.

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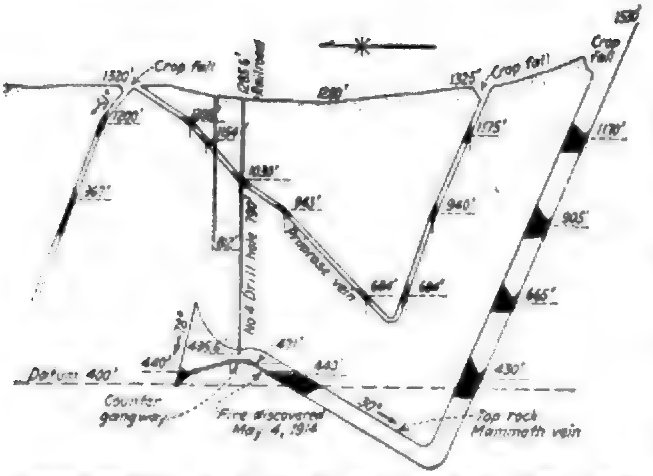
*J. B. Warriner's discussion of Douglas Bunting's paper on "Mine Fires Extinguished by Sealing." Mr. Bunting's address was delivered before the American Institute of Mining and Metallurgical Engineers, at Scranton, Pa., Sept. 12, 1921, and was republished in *Coal Age* under the title "Detailed Description of Fight Against Two Mine Fires," Vol. 20, pp. 373-376.

†General Manager, Lehigh Coal & Navigation Co.



CROSS-SECTION FIRE AREA IN MAMMOTH BED ANTICLINAL, NO. 4 SLOPE LEVEL, LANSFORD COLLIERY

Coal is approximately 60 ft. thick and lies on 70-deg. pitch. Onto the fire in these workings forty carloads of silt were poured through two boreholes. This extinguished the fire.

in what is known as the Sharp Mountain area of the Mammoth bed, all these collieries being part of the property of the Lehigh Coal & Navigation Co.

The Coaldale fire started in December, 1914. Here the bed is on a 45-deg. pitch. Water was used to cool off the fire, and at various points passages were driven into the affected area from the Skidmore bed, underlying it. Tunnels and chutes, both in coal and rock, were driven to isolate and fight the fire. After the area affected was definitely determined and it became evident that it would be impossible to extinguish the fire with water, the gangways, tunnels and chutes were sealed. The holes and crevices as well as the space in rear of the dams were filled with culm. The area was thus effectively isolated and the fire smothered.

Fire Fighting Is Extremely Expensive

Not only did this fire occasion much expense in pumping and ventilation but 1,500 ft. of chutes and 2,000 ft. of headings or holes were driven around the affected area as well as a tunnel at an expense of $125,000. On each shift thirty men were employed driving chutes and headings, six were engaged in carrying timber and supplies to the miners, and an assistant foreman or fireboss was appointed to patrol the area and assure the safety of the men. This fire, as well as others in the Panther Valley, was most advantageously fought from on top by driving chutes, holes, etc.

The Lansford fire also occurred in the Mammoth bed, in the territory known as the Main Curve of No. 4 Slope level. The bed in this area is approximately 60 ft. thick and lies on a 70-deg. pitch. The fire in question occurred on May 4, 1914. After it had been sealed for more than two years an attempt was made to reopen the area. Rock holes and rock chutes were driven underneath the fire area to locate it. In addition, chutes were driven in the bed itself to help fight the fire.

Eventually it was decided that the area should be resealed. Concrete dams were built and silt was run behind them to fill all crevices in the coal, thereby insuring an airtight seal. Five 10-in. boreholes were drilled from the surface, but only two reached the coal bed, the others being abandoned by the contractor. About forty carloads of silt was mixed with water and run down into the fire area and back of the dams. Two years later the area was reopened and no active traces of the fire were found. The cost of fighting this fire was $180,000.

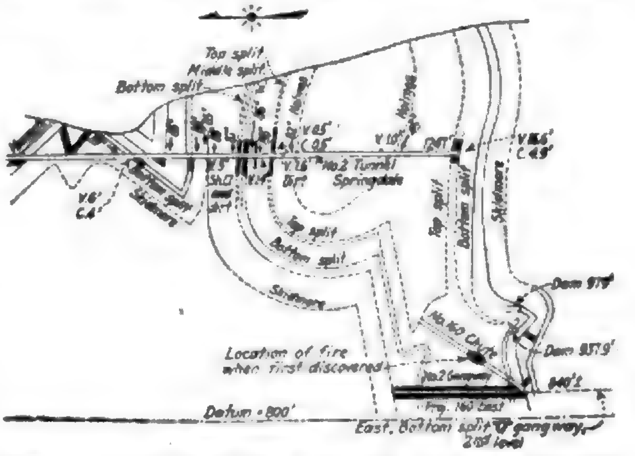
No fire is more difficult to fight than one like that now burning in the Mammoth bed at the Rahn Colliery along the Sharp Mountain invert. The fire area in this case lies in what is known as the East "Q" gangway. Here the coal measure is practically on edge. At breast No. 160, where the fire was discovered above the gangway on Feb. 6, 1918, the bed is in a roll and consequently is 200 ft. thick. About a year after this fire was discovered a hot area was noted on the outcrop a distance of 600 ft. above the gangway.

To fight this fire effectively it was decided to drive into the affected area with rock chutes from the Skidmore bed. Several passages had to be driven from the Skidmore to the Mammoth before the best point of attack was located. A tunnel also was driven into the fire district from the Springdale workings, which are 400 ft. above those of the Second Level at Rahn. The crop coal was mined from this tunnel, and water was run down onto the fire from the Springdale workings. Water also was pumped to the outcrop and run down upon the fire, which is in an area that has been partly robbed. This condition prevents its being isolated by sealing.

A year and a half ago a cave occurred at breast No. 143 on the gangway, since which time no access has been had to the fire. Water is still being run onto it, however, from the upper workings.

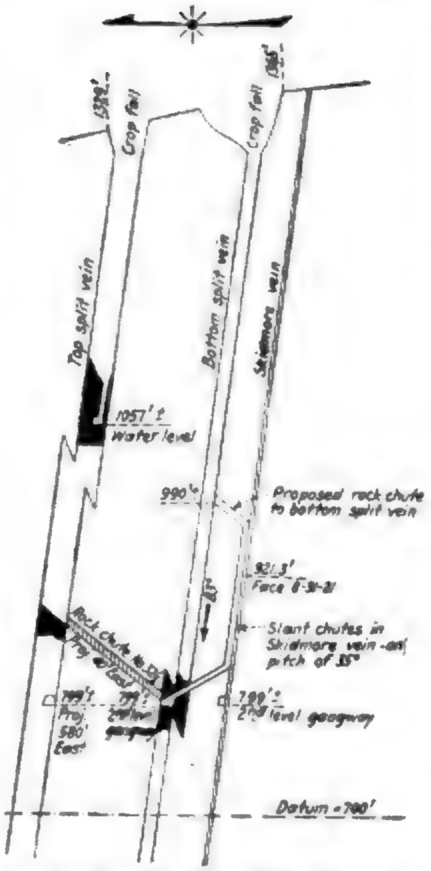
On Aug. 10, 1921, fire was discovered about 30 ft. up in chute No. 33, and immediate steps were taken to keep it off the gangway. This fire is 6,600 ft. west of the one discovered in 1918 and 2,000 ft. east of the shaft. No sign of fire has been noticed on the outcrop as yet, but a 10-in. pipe line will be laid and water will be pumped into it.

To locate the fire area definitely, and also to get above it two rock chutes are being driven to the Skidmore bed from the Bottom Split gangway. One chute is located 180 ft. east of the fire and the other 140 ft. west of it. When the Skidmore bed is reached, two slant chutes on a 35-deg. slope will be driven from the rock chutes. These will intersect near breast No. 38 and up the breast about 150 ft. If a test chute from the junction point proves that the fire is above that point, a checkerboard system of chutes will be driven until a point outside and above the fire is reached. Water can



CROSS-SECTION THROUGH A BREAST IN RAHN COLLIERY WITH CHUTES FOR FIGHTING MINE FIRE

Breast is No. 160 in Mammoth Vein on the east side, second level. In measures such as these it is difficult in the extreme to fight mine fires.



CROSS-SECTION THROUGH ANOTHER BREAST IN BAHN COLLIERY

Fire was found to have entered this breast, which is No. 33. This drawing shows a chute that is being driven in the Skidmore bed to get above the burning coal. This chute appears to be driven almost vertical, but as it lies at an angle to the plane of the paper the grade is only 35 deg. Another rock chute will be driven from the Skidmore to the bottom split of the Mammoth. When completed the real fire fighting will commence, unless the chute runs into the fire itself.

then be poured onto it from these chutes. A pump has been placed at the ditch on the gangway, which with that pumped to the outcrop will furnish all the water necessary to use on this fire. Owing to the fact that the pillars have been removed, the fire cannot be sealed. Several days after the fire was discovered in chute No. 33, a hot spot was noticed along the outcrop at a point 2,000 ft. east of this chute. No one knows whether this is another fire to be fought. It may be merely an extension of the fire in the old gob of the robbed area. The work expended in subduing the fire in breast No. 160 to date has cost $84,000. This sum does not include all the expense of driving special tunnels, etc., in the Springdale workings, for by this work coal was won from a part of the fire area.

Mine fires in heavily pitching beds are dangerous, as gas and other natural obstacles make it difficult to get material to the point where it is to be used. In fighting them, moreover, men are quite likely to fall down the steep breasts. It is difficult to carry a ventilating current up a 6 x 8-ft. rockhole while it is being driven. Furthermore if an explosion occurs, it is extremely difficult for the men to escape.

THE OBJECTS OF new investigation being undertaken by the Bureau of Mines at the Pittsburgh experiment station on the determination of composition of gases arising from a thin fuel bed are: By blowing air at known rates through a fuel bed of known thickness, formed from anthracite, coke or bituminous coal, to find out the quantity and composition of the gases above the fuel bed, and so show how much air must be admitted to burn their combustible constituents.

AN INVESTIGATION OF the loss of anthracite in underground operations is being conducted by the Bureau of Mines, the field work being performed by Charles Enzian, consulting engineer. The following-named sources of loss are being studied: (a) Pillars left for support of the roof; (b) boundary pillars called for by law and otherwise; (c) unavoidable losses in mining; (d) avoidable losses or wastage in mining, and (e) probable average percentage of losses from all causes.

Reports and Investigations State Geological Surveys and Mining Bureaus

Pennsylvania's Largest Coal Reserves Located in Greene County

By JOHN F. REESE*

GREENE COUNTY contains the greatest coal reserve of any county in the State of Pennsylvania. Five beds are of economic interest and have been used in calculating the quantity of coal in the ground. These, in order of present importance, are the Pittsburgh, Sewickley, Waynesburg, Washington and Freeport beds.

Mining and prospecting of the Pittsburgh coal has furnished measurements of its thickness in several places and these together with data from contiguous areas in West Virginia, make possible a fairly reliable computation of the quantity yet available. The Pittsburgh bed underlies all the county except a narrow strip along the Monongahela River.

Sewickley coal underlies practically the whole county, being exposed only in the southeast portion and at the mouth of Ten Mile Creek. Mines on the outcrop and measurements from adjacent localities of West Virginia furnish the only data for computing the tonnage. An average of 20 in. of thickness has been used in townships for which no measurements can be obtained. This coal is thickest in the southeast portion of the county and thins out rapidly toward the north and west.

Numerous sections from the extensive outcrop of the Waynesburg coal and data from reports of the West Virginia Geological Survey give a fairly accurate basis for computing the thickness of this coal. This bed is broken by many partings and at present is used only locally. It will not be mined extensively for commercial use until railroads are built into the county or the Pittsburgh and Sewickley beds become more nearly exhausted.

A fair amount of data regarding the Washington coal is available from measurements of the outcrop in the eastern portion of the county and from its occurrence in West Virginia on the south and west. This coal is mined for local domestic use throughout the area where it outcrops. The bed is badly broken by partings, is very dirty, and is mined only because of local convenience. Therefore, until necessity demands, it will not be utilized much more extensively than now. A thickness of 2 ft. has been assumed in computing the quantity in those townships for which no measurements are available.

Little is known of the Freeport coal in Greene County except that the records of churn drill holes show coal at its horizon. The thickness along the Monongahela River is known from records of core drilling. This bed lies about 600 ft. below the Pittsburgh coal; it does not outcrop and so is assumed to underlie the whole county at considerable depth and with unbroken continuity. In computing the quantity a thickness of 30 in. has been used in all townships. The recoverable quantity has

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*Pennsylvania State Topographic and Geological Survey.

TABLE I. SUMMARY OF RECOVERABLE COAL IN GREENE COUNTY
(In Net Tons)

Township	Pittsburgh	Sewickley	Waynesburg	Washington	Freeport	Total
Aleppo	106,475,760	41,922,000	59,180,400	50,306,400	31,441,500	289,326,060
Center	224,206,200	78,030,000	141,827,175	93,636,000	58,522,500	596,221,875
Cumberland	245,342,845	77,838,750	114,255,425	18,360,000	46,473,750	502,270,770
Dunkard	166,906,170	99,488,250	36,762,075	9,180,000	36,949,500	349,285,995
Franklin	194,398,740	63,112,500	124,316,325	55,080,000	47,277,000	484,184,565
Gilmore	94,847,760	31,537,125	56,763,000	41,126,400	25,704,000	249,978,285
Greene	116,246,340	40,738,160	53,978,400	14,688,000	22,032,000	247,682,900
Jackson	119,034,000	44,370,000	85,068,000	53,244,000	33,277,500	334,993,500
Jefferson	127,937,070	41,248,800	61,419,930	16,524,000	26,277,750	273,407,550
Monongahela	97,711,920	49,778,550	15,353,550	3,672,000	20,999,250	187,515,270
Morgan	148,523,220	41,310,000	80,588,925	20,196,000	31,212,000	321,830,145
Morris	156,125,025	55,692,000	114,971,850	66,830,400	41,769,000	435,388,275
Perry	179,478,180	114,300,945	121,059,720	36,720,000	35,113,500	486,672,345
Rich Hill	228,276,000	93,024,000	167,638,275	14,518,850	69,768,000	573,225,125
Springhill	123,379,200	46,512,000	59,394,600	55,814,400	34,884,000	319,984,200
Washington	123,677,550	41,310,000	92,947,500	49,572,000	30,982,500	338,489,550
Wayne	199,106,550	99,410,220	141,525,000	75,276,000	47,047,500	562,365,270
Whiteley	179,781,120	59,830,650	120,808,800	60,404,400	37,752,750	458,577,720
Totals	2,831,453,650	1,119,453,950	1,647,858,950	735,148,850	677,484,000	7,011,399,400

been estimated at 50 per cent of the whole, from which has been deducted 15 per cent for loss in mining. This bed is ranked fifth because its regularity and extent are wholly assumed. Should future prospecting show it thicker and of better quality than has been assumed, this coal may eventually be mined in spite of its great depth. It is possible also that it will rank higher in economic value than the dirty but more accessible Waynesburg and Washington coals.

Other coal beds than these five are mined for local use but as they are not important and little is known of their extent and thickness they have not been included in the computation of the reserves.

The following method was used in computing the coal reserves: A base map for each coal bed was made by tracing its outcrop from the quadrangle maps made by the U. S. Geological Survey. All available measurements of each coal bed, gathered from federal and state reports, mine maps, core-drill records and personal inspections, were plotted on the map of that particular bed at the locality represented. By studying the distribution of the figures, areas of equal thickness were drawn, and by means of a planimeter the area of each coal bed in each township was measured. For calculating the quantity of coal in any area 90,000 short tons per inch per square mile was used.

TONNAGES ALREADY MINED ARE SUBTRACTED

Areas from which coal has been removed were determined from mine maps and plotted to scale on the base maps. The same method as above described was followed in computing the quantity of coal extracted.

Having calculated the quantity of coal originally contained within the area of any bed and subtracted the quantity already mined from it, the probable percentage of each bed that could be recovered in different localities was determined in accordance with engineering experience. This quantity varies from 50 to 100 per cent, depending on the thickness and character of the bed. The quantity of coal computed to be in any bed, multiplied by the assumed percentage of recovery, less 15 per cent for loss in mining, gives the estimated recoverable tonnage.

The result of computing the coal reserves in Greene County based on the latest maps, engineering data, and methods above enumerated is shown in the accompanying tables.

Table I gives the estimated recoverable tonnage by beds and townships. The figures are here given as computed. It should, however, be distinctly understood that while the acreage of each of the beds has been accurately calculated, the reliability of the average thickness of the coals employed in the computation of tonnage decreases for the several beds given from left to right and for the townships from east to west or from northeast to southwest. Thus, while the figures for the Pittsburgh bed are conservative and probably reliable, those for the Freeport coal may be much too small or many times too large.

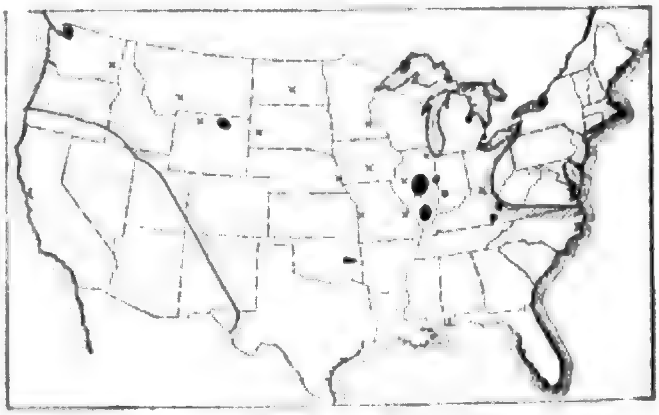
Detailed tables of the coal reserves in each township have been prepared and will appear in printed form in the report now being written on the bituminous coal fields of Pennsylvania. They can be consulted in the office of the State Bureau of Topographic and Geological Survey; or figures for a single township will be mailed from this same office on request.

TABLE II. COAL RESERVES IN GREENE COUNTY
(In Net Tons)

Bed	Original Deposit	Mined Out	Recoverable
Pittsburgh	3,919,485,600	39,420,000	2,831,453,650
Sewickley	1,393,407,000	2,700,000	1,119,453,950
Waynesburg	2,557,242,000	270,000	1,647,858,950
Washington	865,880,000	100,000	735,148,850
Freeport	1,594,080,000	. . .	677,48 ,000
Totals	10,330,094,600	42,490,000	7,011,399,400

Can One Coal Company Cover United States?

THERE are not many coal-producing companies in the United States that sell coal in as many markets as the Peabody organization, with headquarters in Chicago. With mines in five states—Wyoming in the West, Arkansas in the South and eastern Kentucky in the other direction, in addition to huge properties in Illinois and Indiana—the Peabody Coal Co. sells coal in all but 17 of the 48 states, according to data submitted to *Coal Age* and shown in the accompanying map. To distribute the coal from its mines, 14 sales offices in 11 states are maintained.



MARKET TERRITORY REACHED BY PEABODY COAL CO.
Shaded lines indicate limits of market territory. Solid black areas show locations of mines. Crosses represent sales offices.

Should Power Be Purchased from a Central Station or Generated at the Mine Where It Is to Be Used?

Calculations Under Certain Assumed Conditions Show That Generated Power Is the Cheaper—The Only Consideration Favoring Purchased Current Under the Assumptions Made Is a Saving in Investment

By E. Steck*

MINE operators frequently are called on to decide whether to generate or purchase power. So many elements enter into this problem that it is nearly impossible to solve it without the help of an experienced engineer. Every mine presents a different condition, making it necessary to decide each case upon its own merits. Some of the considerations that must be taken into account are the rate offered by the central station, the reliability of its service, the equipment in use at the mine and the extent of electrification to be accomplished.

To illustrate the foregoing, let us consider two mines, one of which is producing coal with inefficient equipment while the other is a new property intended to produce the same tonnage. At the older operation all the equipment above ground is at present driven by steam engines. The piping from these machines to the boilers is bare and, because of faulty design and installation, leaky joints are numerous.

The average steam consumption is about 90 lb. per indicated horsepower-hour. The following is a list of the drives, the rated horsepower of the engines at 25-per cent cutoff and the estimated number of horsepower-hours consumed per working day of eight hours:

Apparatus Driven	Horsepower of Engine	Horsepower-hours	Pounds of Steam Consumed per day
Shop	20	120	10,800
Car puller	25	40	3,600
Fan	75	600	54,000
Pond pump	15	60	5,400
Bottom pump	15	30	2,700
Tipple	45	210	18,900
	195	1,060	95,400

Reducing the above to the necessary boiler capacity on the basis of 30 lb. of water evaporated per hour at the steam pressure and feed water temperature maintained we have

$$\frac{95,400}{8 \times 30} = 400 \text{ boiler-horsepower.}$$

If a simple condensing corliss engine direct-connected to a generator were installed and motors were purchased to replace the small engines, not only would sufficient boiler capacity be available to operate the proposed electrical equipment but, as will be shown later, enough to take care of the bottom load also. On the assumption that the corliss engine will produce an indicated horsepower-hour on 20 lb. of steam, the boiler-horsepower required to produce the requisite 1,060 hp.-hr., allowing 5 per cent for line loss, an efficiency of 93 per cent for the engine and 91 per cent for the generator, would be

$$\frac{1,060 \times 20}{0.91 \times 0.93 \times 0.95 \times 8 \times 30} = 110,$$

thus showing a saving of 290 boiler-horsepower.

In this particular mine cutting machines, haulage and gathering locomotives were to be installed. From the data at hand the average load that would be imposed by this equipment was found to be 175 kw., the maximum being 375 kw. Reducing this load to the necessary boiler-horsepower, using the same engine to supply energy to both the top and bottom, we would have

$$\frac{175 \times 20}{0.91 \times 0.93 \times 0.746 \times 30} = 183 \text{ boiler-horsepower.}$$

Thus it would require 183 + 110, or 293 boiler-horsepower, to carry the load both above and below ground, and as there would be released 290 boiler-horsepower by replacing the smaller engines by the one large unit, no additional boiler equipment would be required. Furthermore, there would be a saving in the tonnage of coal burned even with an additional average load of 175 kw.

The size of unit required to handle this load of 175 kw. for the bottom and $\frac{1,060 \times 0.746}{0.95 \times 8} = 104$ kw. for the top would, of course, be the sum, or 279 kw. The maximum load on the generator would be made up of 175 kw. on top and 375 kw. on the bottom, or 550 kw. in all, but, allowing for the overload capacity of the unit and the diversity factor of the combined load, a 400-kw. generator would be able to do the work.

To accomplish the same results with purchased energy where the power company furnishes 3-phase 60-cycle 2,300-volt service, it will be necessary to use a motor-generator set for carrying the bottom load, with transformers on the surface.

In arriving at a comparison of the cost of current per kilowatt-hour it must be borne in mind that on

ISOLATED POWER STATION, SHOWING MAIN STEAM UNIT

The price of purchased power, the adequacy of the supply and the up-to-date character of the steam plant determine largely whether power shall be purchased or made by the isolated power plant

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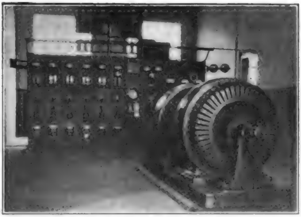
*28 E. Jackson Boulevard, Chicago, Ill.



PLANT USING CENTRAL-STATION POWER

The manufacture of electricity is an industry in itself and some operators and mine managers regard it as a difficult matter to take up as a side issue. To them it seems that the short, if not always the best, cut is to purchase power and so avoid steam troubles.

account of the central-station service being measured on the 2,300-volt line, purchased energy necessary to drive the top motors will be equal to the requisite generated power plus the amount lost in the transformers. That necessary at the bottom will be the amount actually necessary to drive the machines plus the losses in the motor-generator set.

In order to arrive at a basis for computing the cost of a kilowatt-hour the monthly consumption should be considered. A fair basis for normal operation would be twenty working days per month. For the top equipment we have 1,060 hp.-hr. per day at the point of application, or 832 kw.-hr. at the generator and 878 kw.-hr. on the power company's service line. The kilowatt-hours for the bottom carried on the mine power plant would be equal to 175 × 8, or 1,400 kw.-hr., while on the power company's line this would be 1,400 kw.-hr. divided by the efficiency of the motor-generator set, or 1,750 kw.-hr.

An idle day load of eight hours for the top would be approximately 550 kw.-hr. for generated and 600 kw.-hr. for purchased power. The bottom load would be about 400 kw.-hr. on the generator and 750 kw.-hr. on the service line. The night load would be 940 kw.-hr. for generated and 1,050 kw.-hr. for purchased power.

During a month of thirty-one days the total consumption in kilowatt-hours would be as follows:

Period	Power Company's Energy	Generated Energy
20 working days	52,560 kw.-hr.	44,640 kw.-hr.
11 idle days	12,870 kw.-hr.	10,450 kw.-hr.
31 nights	32,550 kw.-hr.	29,140 kw.-hr.
Total	97,980 kw.-hr.	84,230 kw.-hr.

In order to use purchased power an investment would be necessary in a 300-kw. motor-generator set and three 75-kva. transformers. These would cost about $11,000, which would add to the total monthly bill for purchased power approximately $140 for interest, depreciation, taxes, maintenance, etc. The maximum demand when using purchased power would be approximately 530 kw. Thus the power bill would be as follows, assuming 530 kw. as a maximum demand and a 97,980 kw.--hr. consumption:

PRIMARY CHARGES

First 200 kw. @ $1.60 =	$320.00	
Balance 330 kw. @ 1.30 =	429.00	
		$749.00

SECONDARY CHARGES

First 1,000 kw.-hr. @ $.04 =	40.00	
Next 2,000 kw.-hr. @ .0265 =	53.00	
Next 2,000 kw.-hr. @ .0195 =	39.00	
Next 20,000 kw.-hr. @ .0115 =	230.00	
The remaining 72,980 kw.-hr. @ .0095 =	700.61	
Total	$1,062.61	
Less 10 per cent	106.26	956.35
Additional (above-mentioned fixed charges)		140.00
		$1,845.35
*Coal charge $\frac{97{,}980 \times 4 \times (2.75 - 1.25)}{2{,}000} =$		293.74
Total		$2,139.09

*An extra charge at the rate of 4 lb. per kilowatt-hour is made for coal when this costs over $1.25 per ton.

The investment necessary for the generation of power at the mine will be approximately $36,500, creating a fixed charge of about $455 per month. The cost of extra labor, oil, waste and boiler-room maintenance will be $175. Allowing 7 lb. of coal per kilowatt-hour at a price of $2.75 per ton, the cost of coal for generating 84,230 kw.-hr. will be $810. Thus the total monthly power bill will be $1,440, or 1.71c. per kilowatt-hour.

A word of explanation is necessary in regard to the manner in which these results were obtained as well as their significance. No interest, depreciation or taxes were included on the boiler-room equipment, as it will be unnecessary to buy any additional apparatus of this type in order to operate the electrical plant. However, labor and maintenance cost for that portion of the boiler plant required to operate the electrical equipment is included in the above figures.

While the rate per kilowatt-hour for the generated power is only 78 per cent of that for purchased power, the amount of current necessarily generated is only 82½ per cent of that purchased for the same amount of useful energy delivered to the electrical equipment. This accounts for the bill for generated power being only 67⅓ per cent of that for purchased power and the difference in the net power bills being $699.09 per month.

WITH A NEW MINE EQUIPMENT COST IS LARGER

If this were a new mine it would require an investment of about $15,000 additional in boiler equipment, and it would therefore be necessary to charge an additional $150 per month for boiler-room maintenance, interest, depreciation, etc., to the power bill of $1,440 mentioned above. This would make the total bill $1,590 per month, or 1.89c. per kilowatt-hour.

A summary of the results obtained above would be as follows:

	Cost of Equipment Required*	Kilowatt-Hours Required	Cost of Per Kilo-Watt-hr.	Power Per Month	Possible Saving Per Year
Purchased power	$11,000	97,980	2.12c.	$2,139	
Generated power, old mine	36,500	84,230	1.71	1,440	$8,388
Generated power, new mine	51,500	84,230	1.89	1,590	6,588

*This does not include cost of distribution or application.

In this particular case the owner of the old property by making an additional investment of $25,500 over that required for purchased power can earn $8,388, or 31.6 per cent, upon it yearly. In the case of the new property, an additional investment of $40,500 earns $6,588, or 16.2 per cent.

When the output of either mine is reduced conditions are changed, the fixed charges remaining the same but the operating expense and consequently the cost per kilowatt-hour varying markedly. Suppose the number of kilowatt-hours is cut in half or, in other words, that 48,500 kw.-hr. are purchased. The bill then becomes, with 530 kw. as a maximum demand and 48,500 kw.-hr. of total consumption:

PRIMARY CHARGES

	Kw.	Rate per Kw.	Cost	Totals
First	200	$1.60 =	$320.00	
Balance...	330	1.30 =	429.00	
				$749.00

SECON' ARY CHARGES

	Kw.-Hr.	Rate per Kw.-Hr.	Cost	Totals
First	1,000	0.040 =	$40.00	
Next	2,000	0.0265 =	53.00	
Next	2,000	0.0195 =	39.00	
Next	20,000	0.0115 =	230.00	
Balance	23,500	0.0096 =	225.60	
			$587.60	
Less 10 per cent			58.76	
				528.84
Fixed charge on motor-generator set, etc.				140.00
				$1,417.84
Coal charge $\frac{48,500 \times 4 \times (2.75 - 1.25)}{2,000}$ =				145.50
Total				$1,563.34
Cost per kilowatt-hour				3.22c.

The cost of generating power at the old mine under the conditions above assumed becomes:

Fixed charge, engine room	$455
Labor, oil, waste and boiler-room maintenance	175
Coal $\frac{42,100 \times 7 \times 2.75}{2,000}$	405
Total	$1,035.00
Cost per kilowatt-hour	2.46c.

For the new mine the total expense calculated as above would be $1,185 per month, or 2.82c. per kilowatt-hour.

A comparison of the results above obtained would then be as follows:

	Cost of Equipment Required	Kilowatt-Hours Consumed	Cost of Power Per Kilo-Watt-Hour	Cost of Power Per Month	Possible Saving Per Year
Purchased power	$11,000	48,500	3.22c.	$1,563.34	
Old mine	36,500	42,100	2.46c.	1,035.99	$6,340.08
New mine	51,500	42,100	2.82c.	1,185.00	4,540.08

Under the conditions above assumed the owner of the old property earns 24.8 per cent on the additional investment required for operating his plant electrically while the owner of the new property can realize only 11.3 per cent. The only consideration in this particular case favoring the purchase of power is the smaller initial investment necessary.

The mine owner before deciding on whether to purchase or generate current should obtain the opinion of an engineer who is familiar with the power requirements of mines, the cost of generating energy and the application of the central-station rates. The reliability of the central station in furnishing uninterrupted service also should be carefully investigated, as shutdowns arising from a failure of power are extremely costly.

Self-Dumping Cars Traveling on Loop Track Aid Slate Disposal and Coal Discharge

By Alphonse F. Brosky

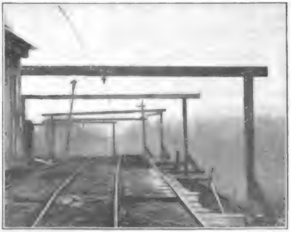
At No. 1 mine of the Jefferson Gas Coal Co., of Pittsburgh, Pa., the coal is handled in an unusual way. This operation, which is practically automatic, is located at Penowa, Washington County, Pa., on a spur of the Pittsburgh & West Virginia R.R. Here the Pittsburgh bed, with an average thickness of 5½ ft., is being worked. The holdings cover 700 acres, lying under two hills at an elevation of approximately 90 ft. above the railroad siding. The ultimate output of this mine will be 1,600 tons daily, and the arrangement is such that only seven men will be required on the surface to handle and load the coal as well as to unload the slate. The crew, when the plant is running at capacity, will include one weighman, one conveyor and feeder operator, three trimmers, one man to drop railroad cars and one handy man to be used as needed.

TIPPLE, CONVEYOR SHED AND RAILROAD SWITCH

The receiving bin is located 90 ft. above the elevation of the railroad track. The structures are not complete as neither tipple nor conveyor are roofed. There are three loading tracks under the tipple. Note the trip at the top of the hill.

The greatest dimension of the property extends practically east and west. To simplify this description I will designate the two hills comprising the property as the East and the West hills. One-way haulage will be followed after the entries have been driven far enough to complete the circuit. A main-face entry is now being driven to split the East and the West hills in a north and south direction. Butt entries are being driven under the East Hill to meet the main-face roadway. At present the West Hill has not been developed. Trips will always travel in a counter-clockwise direction, loads moving along the main butts while the empties traverse the main face entries. By following this plan it is believed that two motors easily can handle 1,600 tons daily.

A ravine which at its lowest point is 70 ft. below the track runs east from the eastern flank of the East Hill.



WHERE COAL IS DISCHARGED FROM CARS TO BIN

Till entry driving is completed the one-way haulage will not be put into effect. At present cars are backed to this point on track shown to left. They are switched onto right-hand track and pulled over the discharge bin being thus automatically dumped by the knuckles or cams which will be noted in the photograph.

LOOKING UP THE CONVEYOR TOWARD RECEIVING BIN

In the construction of this bin posts measuring 4 x 6 in. and 6 x 6 in. respectively are used in alternation. The conveyor is 315 ft. long and will easily handle 1,600 tons daily.

Loads, on leaving the main butt entry, skirt this hill and must of necessity cross this ravine, which gradually deepens to the depth above mentioned where it meets a larger and deeper ravine running at right angles to it. This large ravine is only a short distance from the hill, and the natural depression thus formed is admirably suited to the dumping of slate, and will be utilized for that purpose. A wooden bridge has been constructed spanning the smaller ravine near its mouth.

Automatic drop-bottom cars are used at this mine. Loaded trips containing cars of slate will be stopped to permit of their spotting and discharge at the bridge, after which the trip will proceed to the dumping point of the coal. When the hollow directly under the bridge has been filled, the track will be shifted farther down the ravine.

At first this arrangement will necessitate frequent track shifts, but as the ravine deepens and widens these will occur at longer intervals. When the point of greatest depth is reached the dumping room will be ample to accommodate all the refuse that will be removed from the mine during its entire life. A movable chute will be provided for spouting the slate into the main ravine.

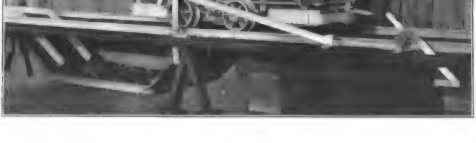
After the slate has been discharged the trip proceeds to the north flank of the East Hill, where the coal is dumped into a receiving bin. It first, however, passes over a weighing platform, where the contents of the several cars are weighed and the weights recorded by an automatic recording device. A weighman enters these records on the weigh sheet. He also has charge of the substation in which his office is located. The snapper who accompanies the trip lifts the check from the cars as they are being dumped.

The drop-bottom cars employed at this mine are of two-ton capacity, are of composite construction and have roller-bearing wheels. The truck frame is built up of channels and angle irons, secured by brackets which are riveted in place. The body is of oak, reinforced, as is customary, by steel bands or belts. This is a one-way car, in that its bottom may be opened and closed automatically only when it is traveling with its head end forward. Three steel-bottom doors drop open consecutively, beginning with the one at the rear end of the car. The rear door is hinged on the hind axle and is held in place by a trigger. The center door is swung from the front axle and overlaps the rear door when both are in the closed position. When, however, the rear door drops, it releases the center door, allowing it to open also. The same relation exists between the center and front doors, the latter being hinged on a bar extending across the car. It, of course, overlaps the center door.

Cam Trips Car Bottom Over Receiving Bin

The trigger which holds the rear door in the closed position is released through the raising of a lever arm at the back of the car. This lever projects beyond the car body on one side and is pivoted on its other end near the car center. The device for raising the lever and thus releasing the trigger consists of an inclined cam rising in the direction in which the car is traveling when passing over the dump. The lower end of this cam passes through a guide and the elevated end is pivoted to a swinging post so arranged that it will not pass a vertical position in the direction of motion of the car but may be tilted in the opposite direction against the force of gravity acting on a counterweight so attached to it as to hold it vertical. A lever fastened to the lower end of the inclined cam by means of a cable, is employed to lower this trigger-releasing device in case cars loaded with slate reach the coal bin. Such cars may thus be passed over the bin without being dumped. The doors are closed by passing over a knuckle. These cars are manufactured by the Sanford-Day Iron Works, of Knoxville, Tenn.

The coal is discharged into a wood bin that is lined with steel plates. Its sides have a slope of approximately 30 deg. and it will hold about 100 tons. From this bin the coal drops onto a feeder of the reciprocating-plate type, by which it is fed to a conveyor. The latter consists of two strands of steel chain fitted with scraper flights at close intervals. This conveyor is 3 ft.



Mine Car and Dump

The inclined cam, so clearly shown in the illustration, raises a lever which in turn pulls a trigger and releases the bottom door at the rear of the car. When that falls the center door is released and that in turn frees the front bottom door, completely discharging the coal.

FULL TRIP CROSSING THE DUMPING POINT

This illustration shows now dumping is normally effected. The trip passes over the dump and each car unloads itself separately and readjusts its doors but without uncoupling or other delay. If there is a slate car all that is necessary is to raise a lever and the car crosses the dump without discharging.

wide and 315 ft. long and runs on a slope of 16 deg. As has been mentioned, the Pittsburgh bed is being mined and as this measure is clean, no picking is necessary. After leaving the conveyor the coal passes over inclined screens, where it may be sized into slack, nut and lump, or be loaded as run-of-mine.

Detecting Use of Matches in Gassy Mines; Match Streak on Gauze Lights Gas*

By J. H. Haertter†
Wilkes-Barre, Pa.

SOME two or three years ago a miner was seriously burned in a gaseous section of Prospect Colliery, where the use of any other than locked Davy safety lamps and Edison electric lamps, safety explosives and blasting batteries was prohibited. Smoking, of course, was strictly forbidden. Near the foot of the main slope was stationed a conscientious, intelligent man who had in his possession a key to open, examine and light all Davy safety lamps when necessary and who, as the men went into the mines in the morning, received from them all matches and tobacco, placing them in a tin box and returning them to the men as they came out at night.

The cause of the explosion was a mystery. I directed that every bit of loose coal in the miner's place be screened over a segment of small mesh. A burned match and a tin box containing tobacco and matches and bearing the scratch of a match were found close to the point where he had fired his last hole. As the miner died on the following day without giving any information these articles furnished the necessary and conclusive evidence as to what had happened.

Less than a year ago a miner and laborer at the Dorrance Colliery who had been warned by the fireboss in the morning that their working place contained gas and who were told to wait until the fireboss could accompany them, disobeyed his order and went into the place, passing a danger board which had been put there in accordance with the requirements of the law. An explosion followed soon after. How could this happen in a safety-lamp district? Inquiry developed the fact that the miner was an inveterate cigarette smoker. Again the loose coal was screened and part of a cigarette and some burned matches were found, thus clearing up the mystery. The miner died from the burns he received.

As, despite the orders of the fireboss, men would sometimes go to their places without waiting for him to accompany them, the following rule was established: When the fireboss arrives at his station, having completed the examination of his section, he shall telephone to the lamp room on the surface the ticket numbers of miners whose places have been found during his inspection to contain gas. The lampman immediately shall place on each of the lamps of those miners a red ticket which indicates that it must not be given to the miner or laborer. The men whose lamps are so ticketed must remain on the surface until all the other men have gone in. The foreman then shall send home all those who, in his judgment, should not go to their places that day and, entering the mines with the others, shall turn them over to their respective firebosses or to some competent person. This man shall accompany them to their working places and see that all gas is properly removed and that before they begin to work their places are made safe.

On Dec. 2, 1921, only a short time after the accident just described, a miner and laborer were seriously burned when the miner, in a hurry to get enough coal to finish the loading of his last car, and knowing, as he afterward admitted, that there was gas in his place, went up with a naked light, placed it on the gob and proceeded to push the coal down the chute, bringing the gas down upon his lamp.

A Faint Scratch Explains the Explosion

On the following day, Dec. 3, gas exploded at the Dorrance Colliery at about 5:30 p.m. Upon his arrival the night foreman proceeded to make an examination for gas and, finding it, was warning the miner and laborer to withdraw from the place when the gas exploded, all three men being burned. What had caused it? Electric and Davy lamps, safety powder and blasting batteries were used, and smoking was prohibited. Surely neither the miner nor the laborer could have been smoking in the presence of an assistant foreman.

The Davy lamps of the miner and fireboss were carefully examined under an electric light in the lamphouse and found to be in good condition. On the following Monday, however, the company officials learned from the gangway miner that he had given several matches to the airway miner a short time before the explosion. Upon a further examination of the miner's lamp by daylight faint marks which indicated the striking of matches on the gauze could be noted when the lamp was held four or five feet away from the eye.

It was then decided to make tests and an explosion chamber was prepared by the company chemist. It consisted of a small tin box with its sides composed of glass doors that would be blown open readily by the force of a gas explosion. The gas was to be admitted to the box by a small tube. A safety lamp which was ascertained to be in good condition was lighted and placed in the receptacle after a match had been struck on the gauze, leaving a streak of white substance behind it. After closing the doors of the box and admitting city gas for a few seconds, the flame was seen to pass through the gauze, and an explosion took place, forcing the glass doors open. Examination of the gauze after the explosion showed only a faint mark at the place where the match was struck, for the substance thus caused to adhere to the gauze was completely burned.

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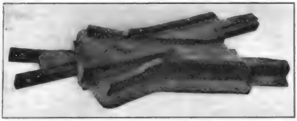
*Excerpt from article entitled "The Gas Explosion, Its Cause and Remedy," in Lehigh Valley Coal Co.'s *Employers' Magazine*, April, 1922.

†Division superintendent, Lehigh Valley Coal Co.

Frog, Guard Rails and Fishplates Cast as Unit Save Mine Trips from Wrecks

A TYPE of flanged rail frog made of steel casting, which it is asserted overcomes many of the shortcomings of the older type, was recently placed on the market. The frog is shown in the accompanying illustration.

When the ordinary frog built up of rail sections riveted to a base plate is employed, not only is this composite unit required but a guard rail and several pairs of fishplates as well. The guard rail works fairly well when the wheel gage is fixed, as when both wheels are attached rigidly to the car axle, but sometimes gives trouble when one or both wheels are loose and the gage is thus more or less variable. Under such circumstances the wheels sometimes "split the frog"—that is, part of the car trucks take the frog correctly while some do not, frequently resulting in a more or less serious wreck.



GUARD RAIL AND FROG MADE INTO ONE

By combining the guard rail and the frog the distance between the two is regulated and made constant. The guard rail not being dependent on spikes does not pull loose. The frog and the rail being connected directly by bolts, irregularities in the track are guarded against and consequently the frequency of derailments is reduced.

The flanged frog, on the other hand, combines the guard rail with the frog, placing it where it will be the most effective. Thus with a frog of this kind it makes little difference whether the wheel passing is tight or loose on its axle; the flange guides it through its proper course in any event.

In addition to this feature the frog here shown requires no fishplates to join it to the rails. The extremities of the frog are so shaped that the rails lie alongside and are bolted direct to them. This simplifies the connections while simultaneously securing a strong and efficient joint. This device, known as the Graham flange frog, is made and sold by William Wharton, Jr., & Co., Inc., of Easton, Pa.

Charcoal and Its Related Products

WOOD charcoal, one of the purest forms of carbon, is of importance principally in the manufacture of charcoal iron. The production of charcoal for this purpose, says the *Commerce Monthly*, formerly was a distinct and important industry, but it has gradually been superseded in recent years by the expansion of the wood-distillation industry, of which charcoal is but one of many products.

Other uses of charcoal are numerous and important. The manufacture of black gunpowder and blasting powder requires about a million and a half bushels annually. In making crucible steel it may be used to provide the necessary carbon, and a small amount is used as a dry color in paint manufacture. The porosity of wood charcoal gives it the power of absorbing certain gases. For this reason it is often employed as a disinfectant and it also has medicinal value. This property and its power to remove coloring matter from solutions make charcoal valuable as a filtering medium, since it removes objectionable organic matter and to some extent softens hard water. Charcoal as a domestic fuel has in large part been superseded by gas, electricity and kerosene.

Charcoal is manufactured by two general methods: First, the charring of hardwood either in earth-covered pits or in brick kilns, without making any attempt to save the escaping gases, and, second, as a product of the wood-distillation industry. By the latter method wood is charred in ovens or retorts, and the gases are collected in condensing chambers. This method is now being generally adopted because of the value, especially during the war, of the chemicals obtained.

The chemicals obtained as byproducts in the distillation of wood are so numerous and valuable that they are now worth much more in the aggregate than the charcoal, so that the production of charcoal has been to a great extent subordinated to the production of chemicals. This was particularly true during the war, when the demand for these chemicals was urgent on account of their use in the manufacture of war materials. The consequent increase in the charcoal output of the wood-distillation industry and decline in the output of the charcoal industry, where byproducts are not saved, are shown in Table I.

TABLE I. PRODUCTION OF CHARCOAL IN THE UNITED STATES
(In Bushels)

Year	Charcoal Industry*	Wood Distillation Industry	Explosives Industry†	Totals
1899	27,000,000	17,150,000	‡	44,150,000
1904	26,000,000	29,900,000	1,150,000	57,050,000
1909	14,300,000	39,950,000	750,000	55,000,000
1914	6,400,000	44,850,000	150,000	51,400,000
1919	3,450,000	48,500,000	‡	51,950,000

* Calculated.
† Consumed in the industry.
‡ Not available.

Table II shows the output of the various products of the wood-distillation industry in 1899, 1909 and 1919.

TABLE II. PRODUCTS OF WOOD DISTILLATION INDUSTRY

	1899	1909	1919
*Wood alcohol, crude, gallons	4,946,000	6,773,000	6,981,000
*Wood alcohol, refined, gallons	3,038,000	6,733,000	6,985,000
Acetate of lime, pounds	86,826,000	141,478,000	152,064,000
Charcoal, bushels	17,154,000	39,952,000	48,499,000
Turpentine, gallons	....	707,000	1,521,000

*Produced for sale; does not include alcohol used in the industry.

IN THE STUDY of the ignition of coal-dust clouds in open air being conducted at the Experimental Mines of the U. S. Bureau of Mines, Bruceton, Pa., tests were recently made with pulverized Pittsburgh coal and with pulverized Colorado lignite. In some of these tests flame extended 45 ft. into clouds that were 50 ft. long, the lignite dust cloud making a larger flame than Pittsburgh coal dust. An attempt will be made to get a greater length of flame with an increased length of dust cloud.

WORK ON THE FLOAT-AND-SINK METHOD of cleaning coal, conducted at the Northwest experiment station of the Bureau of Mines, Seattle, Wash., has resulted in the development of an efficient large-sized machine for making these tests. This machine has been used in studying the washability of coal, in controlling the washing operation, and for measuring the efficiency of the individual coal-washing machines. In using this machine for future studies there is a possibility that it will be developed even to a more efficient point. This machine, however, does not give satisfactory results using fine sizes of coal. Work is being planned in which the limitations of the float-and-sink method on fine sizes will be determined. It is hoped that the float-and-sink machine can be adapted to washery control in the coal washeries of the State of Washington.

Liquid Oxygen in a Vaporizer Used for Resuscitation

Oxygen Is Kept in a Vacuum Bottle, the Heat Being Regulated Either by Electric Energy or the Application of Heat-Conducting Metal Surfaces—Gas Readily Brought to Breathable Temperature

By Henry Briggs*
Edinburgh, Scotland

BREATHING apparatus depending on a supply of liquid oxygen or liquid air are of two classes: First, the portable, self-contained mine-rescue apparatus, and, second, oxygen-administration appliances. The liquid-air mine-rescue equipment has been discussed in a previous article.† The latter class is undergoing a rather rapid process of evolution. It came into prominence as the result of the adoption by the German air forces, during the latter part of the war, of the Heylandt vaporizer to meet the need of the high-flying airman for more oxygen than light air will afford. This vaporizer, which is usually arranged to deliver to two men "in parallel," can supply air at any rate up to 12 liters per minute.

Fig. 1 is a section of the Heylandt vaporizer. It consists of a Dewar metal vacuum flask, *A*, of brass or steel, having in connection with the vacuous space a mass of "activated" charcoal, *C*. This, by occlusion or absorption of residual gas, maintains the necessary degree of vacuum. Liquid oxygen is poured into the flask through an opening, *B*, which normally is closed by a screw stopper fitted with a carrying handle. Evaporation of the liquid within the flask (stimulated at first by turning it upside down) maintains a pressure in the bottle of 12 or 15 lb. per square inch. A blow-off valve, *F*, prevents the pressure from rising above a predetermined figure. The success of the apparatus depends largely upon the proper functioning of this valve *F*. *G* is a pressure gage.

Superheaters Draw Warmth from Frosty Air

Under the influence of the pressure in the bottle, the liquid passes up the tube *D*, and drips into the external boiler *E*. This device is provided with a number of tubular, finger-like ajutages, *H*, which serve as heat-catchers. A second, auxiliary boiler, *K*, is usually provided in the German-built vaporizers, doubtless with the intention of catching and evaporating any liquid escaping from the first. The evaporated oxygen makes its way through long copper warming coils, *L* and *M*, to a regulating throttle, *R*, the adjustment of which controls the gaseous discharge. When this valve is nearly closed, pressure increases in the boiler and the discharge of liquid by the siphon tube is less rapid; when it is opened, the back pressure in the boiler is relieved and the liquid passes over more quickly; when the regulator is completely closed, the only gas discharging is that due to normal evaporation in the bottle—a flow usually amounting to about ½ or ¾ liter of gas per minute.

The tube, or tubes, carrying the gas to the men is attached to the apparatus above the bag, *V*. The latter serves a dual purpose, acting, first, as an equalizer or reservoir between the continuous delivery of the vaporizer and the intermittent inspirations of the lungs, and, second, as a gage, indicating by its degree of distension the sufficiency or deficiency of the supply.

The Heylandt vaporizer possesses certain obvious advantages: (1) It does not fractionate the oxygen-nitrogen mixture; that is to say, if the bottle contains a mixture of 80 per cent liquid oxygen and 20 per cent liquid nitrogen, the gaseous discharge from the apparatus has this same composition. I have called attention to the advantage of using as pure oxygen as possible in any of these vaporizers, but the need for so doing is less urgent in this type than in any other. (2) This vaporizer admits of remote control. The regulating valve *R* may be placed on the apparatus, as shown, or at any distance from it. This is a great advantage in aircraft, whether the vaporizer be used to supply oxygen to the man's lungs or his engines. It also is of importance when these appliances are required to deliver oxygen for breathing through a hose-pipe, for if the regulator were attached to the "dress" worn by, say, a mine-rescue man, he would be enabled to adjust the rate of delivery of a vaporizer placed some distance outbye. The advantage in question, however, is not felt when the apparatus is used as a resuscitator or oxygen-reviver. This to the mining engineer is its most obvious application. (3) The flow from a Heylandt vaporizer can be regulated with ease and speed throughout a wide range.

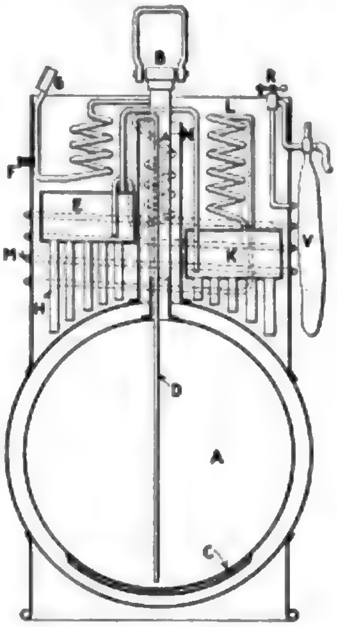


FIG. 1. HEYLANDT VAPORIZER

Regulation is secured by valve *R*. Excessive care is taken to "superheat" the air so that it will be warm enough to breathe. This probably is provided because the vaporizer is intended to be used in the cold regions of the upper atmosphere.

With the vaporizers of this kind that I have had the opportunity of testing, the rate of flow did not remain constant when the regulator was left undisturbed for a period of, say, half an hour. This defect is of but slight importance where the appliance is continuously under observation, as in the case of an airman or of a mine-rescue man employing the vaporizer as a reviver, for then the discharge can be readjusted at any time. It is, however, a grave drawback for hospital use (e.g., in the treatment of pneumonia and other lung affections), where it is necessary to be able to leave a more or less helpless patient for hours at a time receiving oxygen from the apparatus.

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*Professor of mining, Heriot-Watt College.

†Article entitled "Liquid Air Boiling Away at Partially Regulated Speed Used to Supply Mine-Rescue Men and Rescued," by the same author; see *Coal Age*, April 6, Vol. 21, p. 609.

The regulator handle, *R*, may move over a scale marked in liters per minute of flow; but, at its best, the scale can be correct for only one pressure within the flask. It is necessary, therefore, to have a direct-reading flow-meter (of the bobbin, deflection-vane or water-manometer type) on the delivery tube between the vaporizer and the breathing mask. The other forms of vaporizers here described also need this auxiliary fitting.

Sir James Dewar produced the first electric vaporizer. He introduced a resistance coil through the neck of the flask, the coil being immersed in the liquid. This form, again, admits of ready regulation and accurate control from a distance. Moreover, the resistance coil may be inserted into a "container" or storage flask, which may thus be converted into a vaporizer. Large-size vaporizers of this description may be useful in supplying oxygen to medical chambers or to the engines of aircraft. Their dependence on some form of electric supply, however, makes this type of vaporizer less serviceable for mining use.

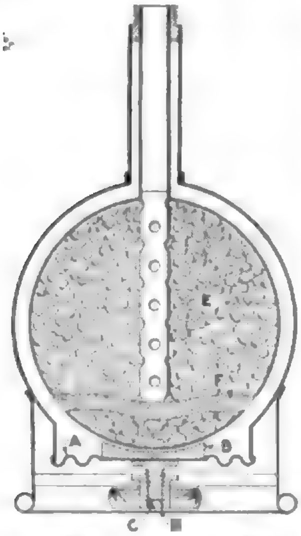


FIG. 2. GRIFFITHS VAPORIZER

The lower part of the vacuum chamber consists of an aneroid-barometer diaphragm carrying a copper conductor. A screw raises or permits to be lowered this copper conductor, thus increasing or decreasing the quantity of heat communicated from the exterior air.

Dewar was, I believe, also the first to devise a conduction vaporizer, in which the evaporation of the liquid was stimulated by admitting a controllable amount of heat from the outer atmosphere. A form of this device, depending on this principle which I designed in 1918, but which was intended more for hospital administration than as a reviver for use in mines, consisted of a short-necked metal Dewar flask into the mouth of which could be pushed, first, a brass tube reaching to the bottom of the bottle, and second, a stout copper rod sliding inside the brass tube. The rod was furnished with a copper piston at its lower end, making a sliding fit within the brass tube.

Sheet-Copper Spokes Carry Heat to Liquid

A heat-catcher consisting of radiating sheet-copper spokes was attached to the upper end of the rod. When both rod and tube were drawn up, the evaporation of the liquid oxygen took place merely at the normal, unassisted rate for the flask (0.5 or 0.7 liter per minute). To increase this rate the brass tube was first pushed into the flask and afterward the copper rod also. Heat passed along the rod, through the piston and the brass tube, into the liquid, stimulating evaporation. The further down into the interior of the vaporizer the rod was thrust the more rapid would be the discharge of oxygen.

A number of these vaporizers were made and proved useful. They have the advantages of simplicity, low cost and absence of parts under pressure. But they are rather top-heavy when the sliding parts are withdrawn, they do not give a sufficient range for a reviver that may have to be used in foul air, and the formation of frost upon the projecting portion of the rod is apt to cause it to stick. Although the flow of gas remains remarkably constant when this device is left to itself for hours at a time, the discharge does not immediately settle to its final value; it is always high when the rod is first inserted and does not become constant for ten minutes or thereabout.

Aneroid Diaphragm Regulates Heat Passage

To my mind the most promising attempt yet made at a conduction vaporizer is that of E. A. Griffiths. This apparatus is shown in Fig. 2. It consists of a Dewar vacuum bottle made of copper, provided in the base with a german-silver aneroid diaphragm, *A*. To the inner side of the diaphragm the thick copper disk, *B*, is attached, the outer side being fitted with a screw, *C*. A nut, *D*, which can be turned by hand, engages with this screw, and by rotating it the diaphragm can be flexed inward and the disk, *B*, brought against the inner bottle. More or less pressure can thus be exerted between the disk and the inner globe, and the heat-conductivity of the bridge across the vacuous space thereby altered.

This appliance is simple, compact, self-contained, readily understood by the non-scientific operator, and gives a uniform discharge over long periods. It was designed as set forth in the *Colliery Guardian*, April 1, 1921, p. 945, as the means of supplying oxygen to a mine-rescue apparatus, but probably it will find a wider field of utility as a reviver and in hospitals. As the figure shows, the inventor intends the liquid oxygen in the flask to be soaked up in dry asbestos wool, *E*, thus avoiding spillage of the liquid in case the bottle is upset. *F* is a tube containing charcoal.

All the vaporizers described, except that of Heylandt, fractionate in evaporation. When the liquid contains an appreciable amount of nitrogen the gas issuing from the vessel is considerably lower in oxygen than the liquid itself. This fact has no practical significance for revivers if the liquid contains more than 95 per cent of oxygen.

Easy to Heat Air to Safe Breathing Temperature

To judge from the complicated set of coils through which the oxygen issuing from a Heylandt vaporizer (Fig. 1) has to pass before it is admitted to the breathing mask, it may be thought difficult to raise the gas to a suitable temperature for inhalation. This is by no means true. Elaborate convolutions of copper tubing are unnecessary, especially for any vaporizer in which the stimulated evaporation is caused to take place within the flask itself, for in that case the gasified oxygen gains an appreciable quantity of heat in passing up the neck of the flask. As a result it issues from the neck at a temperature usually between —4 deg. and —30 deg. C. I find that with a conduction vaporizer the gas stream can be brought to a comfortable temperature merely by allowing it to pass through a 12-ft. piece of rubber tubing placed between the vaporizer and the breathing mask. Mr. Griffiths passes the oxygen through four narrow metal coils, encircling the neck of the flask, before letting it enter the flexible tube.

Protect Wood from Fire or Guard It from Getting in Condition to Burn Freely

By George M. Hunt[*]
Madison, Wis.

By CHEMICAL treatment wood can be made fire-resistant. Injected into its fibers, ammonium phosphate, ammonium sulphate or borax will make wood highly resistant to fire. Wood so treated cannot be ignited by a spark or other small source of heat. When continuously exposed to a high temperature for a long time it will char and fall to pieces, but it will not support combustion or spread flame until after the treated part has been destroyed. These chemicals have not found wide use in the treatment of wood largely because operators have not been willing for the sake of fire protection alone to undergo the expense involved. None of these chemicals is known to be a wood preservative and in the absence of test data their effect on the durability of wood against decay can only be conjectured.

Tests of the coating of timbers with cement as a means of rendering them fireproof have been made, for it is obvious that the fire hazard will be practically eliminated if the wood be afforded a sound, thick and permanent coating. The degree to which such coatings enable wood to resist decay remains to be determined. If they can be made dense enough and be kept sound enough permanently to exclude air from the wood, decay cannot, of course, proceed far. Cracks in the cement will admit air to the wood, however, and permit decay. Furthermore, it probably will be found difficult completely to cover the sides of timbers and lagging which are next to the walls and roof. If adequate tests demonstrate that cement coatings will prevent decay long enough to justify the expense and that maintenance charges are sufficiently low, this method may prove valuable.

Once Decayed, Timber Is Ready to Burn

It is a well-known fact that decaying timber is easy to ignite unless it is wet. A match or a spark can start a blaze instantly in the rough, punky surface of a partly decayed stick. If the wood does not blaze at once, the fire may smolder and travel for hours until it reaches a favorable spot or until it is fanned by a draught into greater activity. On the other hand, the solid surface of a sound stick of wood, such as a mine timber, does not ignite so readily. This is especially true if the bark has been peeled off and a smooth surface has been left.

The surest way to keep timber sound and free from decay over a long period of time is to apply preservative treatment. There are several preservatives and several methods of applying them which are suitable for use on mine timbers. The variety is so large that no mine need be denied the advantage of preservative treatment of timber for lack of a preservative or a convenient method.

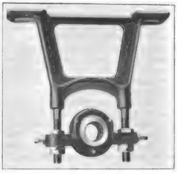
Coal-tar creosote and zinc chloride are the two preservatives most commonly used, and their effectiveness in preventing decay has been thoroughly demonstrated. Objection is sometimes made to coal-tar creosote on the ground that it makes wood more inflammable. There is little evidence, however, to support this claim, especially if the wood has been in use for a short time and the excess oil has evaporated from the surface. Cases are on record of creosoted wood that appeared to have suffered less damage from fire than did untreated wood. Creosote has been used in several mines for years with excellent results.

Objection cannot be taken to zinc chloride as constituting a fire hazard, nor can it be considered of itself to be a fire retardant, like ammonium phosphate or ammonium sulphate. If zinc chloride has any direct effect on the inflammability of wood, it probably is to decrease the danger. Through their effect on decay, however, as previously described, both creosote and zinc chloride indirectly reduce fire danger by keeping wood sound. It is not beyond the realm of possibility that a preservative or combination of preservatives can be devised which not only will preserve wood against decay but will also be an effective fire retardant. However, no such method seems available at present.

Shaft Hanger with Ball Bearings Designed To Lower Frictional Losses

THE improved ball-bearing shaft hanger shown in the accompanying illustration embodies several interesting details of design. Thus the principle of two-point suspension has been made use of. The bearing is carried in a split housing rigidly held by two threaded suspension rods. This makes a strong, compact unit—easy to assemble, align and inspect.

Any necessary horizontal or vertical adjustment can easily be made at the end of the housing by means of the locknuts and setscrews provided for that purpose. This eliminates the possibility of applying pressure that might be transmitted to the bearing proper while adjustments are being made. Self-alignment provided within the bearing itself allows the shaft to revolve freely and easily at all times and precludes the possibility of all rubbing, heating and binding. When a shaft is provided with these hangers, which are manufactured under the supervision of the S. K. F. Industries, Inc., it may be assembled on the floor with the bearings in plain view, then raised into position for final adjustment with the upper half of the housing removed. This assures absolutely correct assembling. In most plants the freedom from trouble and the decreased friction obtained by the use of this hanger permit large savings to be made.



BALL-BEARING SHAFT HANGER

Provision is made for horizontal and vertical adjustment by means of locknuts and setscrews.

Conferences Have Recently Been Held between representatives of the U. S. Bureau of Mines and the Navy Department concerning coal developments in the Bering River field of Alaska. The suitability of the coal for navy use and the possible application of the Trent process in treatment of the coal were discussed. Studies have been made regarding the application of this process to assist coal mines producing coal with much impurities in Oregon, Washington and Alaska.

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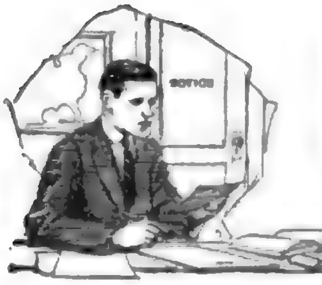
[*] In charge, Section of Wood Preservation, U. S. Forest Products Laboratory, Madison, Wis.



Problems of Operating Men

Edited by James T. Beard

Why Worry Over Change in Certificate Law

Change in the Old Certificate Law Made to Meet Conditions That No Longer Survive—The New Law a Dead Letter—Uncertified Men Not Wanted

MUCH has been said, by writers in *Coal Age*, regarding the certification of mine officials and interest in the subject shows no signs of abating. I have asked myself several times, "Why worry over this matter?" The results that were quite naturally feared when the old law was changed permitting the employment of uncertified men have not been realized.

As has been explained more than once, in *Coal Age*, the change in the law was made to satisfy the claims of certain operators, at the time when the Miners' Compensation Law went into effect in Pennsylvania. It was argued, then, that if the operator was made liable for the acts of his foreman he should have the privilege of choosing the kind of man who was to take charge of his mine.

Several years have passed since that time and there is not now the same dread regarding the working of the Compensation Act, on the part of coal operators. Indeed, the result of the passing of that law has made large operators all the more desirous of employing certified men.

There is no question, today, but that the average coal operator now regards the man who has gone through a mine foreman's examination and come out successful, is more to be trusted to take charge of underground work, than what operators have been pleased to term a "practical man," only.

No Chance for Uncertified Men

It is well known that a man who does not hold a certificate has very little chance, in competition with a certified man, when seeking a mine foreman's position at any of the large mines in this state. To such an extent is this true that, now, the young man who aspires to mine foremanship first prepares himself for the examination and secures a certificate before applying for the position.

No mine inspector would think of recommending a man without a certificate. Taking everything into consideration, one is forced to the conclusion that the new law is a dead letter, since the very men who might take advantage of its requirements are the ones who are ignoring it and studying to fit themselves to take the examination and obtain their papers.

Let me add a word, here, regarding the certification of the mine superintendent, which has been so often urged and which I believe no sane mining man will deny would benefit the superintendent and the operator who employs him.

It is my belief that operators' eyes have been opened to this fact. I well remember the time when a mine foreman's chance of promotion to a superintendency was about one in a hundred. Now, all that is changed, and the successful mine foreman is in line for a superintendent's position for which he is well fitted by experience and knowledge.

Life of the Certificate

Regarding the length of time a certificate should hold good, I must differ with the suggestion that they should be renewed every four years. I may be wrong, but feel that the man who has studied for his certificate, and is any sort of a man, will not lose his interest when the paper is handed him, but will keep his knowledge up to date.

Any mine foreman who is worth while is brought into daily contact with different phases of the subject he has been studying; and he will not be satisfied until he has tested the knowledge gained, by applying the principles taught him to the solution of the many problems that arise in the mine.

He can never be the same man again, but continually sees things in a new light. The nature of the coal and rock strata interests him; the very air he breathes seems different from what it was before; and he studies the ventilation of the mine from a new viewpoint.

With this picture of a certified man before us, let me ask, What benefit would arise from an examination every four years? When a doctor, a druggist, dentist or lawyer receives his diploma he hangs it up in the full assurance that he will not be asked to pass the same examination again. Should not the same apply to our mine foremen and superintendents?

Indiana, Pa. THOMAS HOGARTH.

ANOTHER LETTER

WITH keen interest and real pleasure, I have followed the discussion regarding the effect of the amendment to the certificate law, in Pennsylvania. Most of the writers have shown their progressiveness by lining up in favor of the certification of mine officials. While rejoicing in this fact, I have deep respect for the honest convictions of those who are otherwise minded.

One correspondent, however, appears to overstep the bounds of credulity in an effort to support his claim and displays, to my mind, much inconsistency. I refer to the letter of R. W. Lightburn, *Coal Age*, Feb. 16, p. 291.

Amendment No Advantage

Mr. Lightburn says he does not wish "to attempt to destroy any advantage that has been gained through the amendment to the certificate law, in Pennsylvania." It is hard to believe that this is a serious remark, as few consider that there has been any "advantage" resulting from the amendment to the law. On the contrary, disadvantage must be evident to every right thinking person.

Seriously, who will deny but that the 1915 amendment leaves a loophole for the employment of incompetent men, by reason of some affiliation in lodge, church or political associations.

Again Mr. Lightburn says, "The successful mine foreman is the man who combines with his practical experience a knowledge of the principles of mining." I would ask, How is this consistent with his previous remark that, "The holding of a certificate does not make a man any more proficient than he was before he obtained the paper."

No one will deny that the possession of a certificate is evidence that the holder has gained a knowledge of the principles of mining that will make him a successful foreman if combined with good common sense and practical experience in the mine.

Service Certificate Should End with Service in Company

Further reference might be made to this phase of the subject, but it would seem to be needless in view of the fact that the certified man is everywhere in demand today. In passing, let me say that it is rather unfortunate that no time limit has been put on the "service certificate." It would seem to have been well if service under such certificate had been limited to the time the holder was employed in the same company.

Before closing, I want to say a word about the "vest-pocket certificate," mentioned by Mr. Lightburn. That gentleman's information regarding the certificate must have been obtained from an old Englishman whose experience antedated the Coal Mines Regulation Act of 1887, which provided for the compulsory certification of managers and undermanagers of mines. The so-called "vest-pocket certificate" was a permit given by the mine manager (foreman) to a shotfirer, authorizing him to fire shots in that mine.

EFFORTS TO EDUCATE MEN IN GREAT BRITAIN

The certification law in the United Kingdom was extended, in 1912, to include firebosses, who have since been required to submit to a rigid eye test. In addition to requiring certification under the British Mine Law, the Government has established a wonderful system of technical night schools where students within a radius of three or four miles can be taught, the expense of transportation being met by the county, at the close of each session. The cost of tuition is practically *nil*.

In this respect, I am speaking from personal experience, having spent two happy years attending such a technical night school, after which I have worked for fourteen years, under the British Mine Law.

Before taking the first-class or manager's examination, the candidate must have studied the organized course, for a period of four years, at one of these technical night schools. Two years are required to take the second-class or undermanagers's examination.

In view of these statements, perhaps Mr. Lightburn will be willing to admit that England has been a pioneer in the making of certification laws and, in addition has provided the means for instruction to enable their miners to qualify themselves for official positions in the mines. JOHN WALLS, SR.

Bayview, Ala.

Number of Cars Needed To Operate a Mine

Estimating the output of coal from the number of miners employed—Conditions with respect to haulage determine the number of cars required.

REFERRING to an Examination Question that appeared in Coal *Age*, Feb. 23, p. 335, asking for the number of cars required to operate a mine employing 250 diggers and using electric haulage, allow me to suggest that the estimate of 2½ tons, per man, per day, is low.

In this locality, each digger will load an average of eight or nine tons a day. Now, while this may be too high for a general average, it would seem to me that an estimate should be based on an output of, say six tons, per man, per day, which would make the total output of this mine 6 × 250 = 1,500 tons of coal.

It is a very hard matter to figure out just the number of cars that will be necessary to operate a mine to the best advantage, as there are many things that will affect the problem. Working double, two men loading a car, will require 125 cars standing in the rooms; or, working singly, 250 cars would be required in the rooms. Again, if what is known as the "split turn" is used, but half this number of cars will be required in each case.

Assuming each miner has a full turn, however, the driver setting in an empty, for each load pulled out, and the men working double, we will say there are 125 cars loading and, perhaps, with three motors hauling eight-car trips, each, there will be 24 cars in transit and as many more standing on the tipple making, say 175 cars in use, assuming the motors haul from the face to the tipple. If mules are used for gathering the cars, there will be required from 25 to 30 more cars standing on sidetracks.

In the answer to this question, an electric locomotive is assumed to make 12 trips a day, hauling twenty-six 2-ton cars in a trip. Allowance is made for one trip loading on the inside parting in the mine; another trip in transit; and a third trip being unloaded at the tipple. A further allowance of 25 cars loaded with timber and other supplies and nearly the same number in the repair shop or idle in the mine, making about 125 cars in all.

In my opinion, all timber and other supplies should be handled at night, making this allowance unnecessary.

Central City, Ky. OSTEL BULLOCK.

Two Kinds of Mine Foremen

Co-operation of men and bosses essential to success—Men respect a boss who knows what he wants and is firm —Two foremen who tricked their employers in seeking promotion.

IT WAS with much satisfaction that I read the excellent letter of George Edwards, *Coal Age*, Jan. 12, p. 52, in which he brought out several important items in reference to coal mining and the success of mine officials.

In his letter, Mr. Edwards emphasizes the need of co-operation between the mine officials and the men they employ. He describes the successful boss as one who is a leader among his men. We all know that one man can accomplish little acting alone, while co-operation is sure to bring results and its need is essential to success.

My experience is that a boss who has the ill will of his men may as well seek another location, for failure will surely be his doom, sooner or later. A foreman finding himself in that position would do well to make a close study of his men with a view to ascertain how to manage them successfully and get results in the mine.

MEN RESPECT THE FOREMAN WHO KNOWS WHAT HE WANTS

Let me say, here, that a foreman must show his men that he is boss, while at the same time treating them right and holding their good will. The foreman who allows his men to have their own way does not gain their respect. When his back is turned they will pass remarks that are not to his credit and the laugh will go around.

On the other hand, the foreman who knows what he wants and is kind but firm in his requirements is respected and obeyed. I believe a foreman should be very slow in forming his conclusions. He should make sure that he is right before starting something and then stand firm in his decision.

TRICKING THE COMPANY

In my experience, it has happened twice to know of mine foremen who gained promotion to superintendencies, by tricking their companies. In each case, the foreman was able to reduce the expense of operation very largely, in a short time after taking charge of the mine.

This was accomplished by the said foreman getting rid of a number of daymen and shifthands who he claimed were unnecessary to be kept on the payroll. Every item of expense that could be eliminated, whether for labor or supplies, was cut out.

The result was a rapid reduction in the cost-sheet, while extraordinary efforts were made to maintain the daily tonnage. It may well be imagined that little timbering and other deadwork was done in that mine, for a time. The result, of course, pleased the management and it was not long before each foreman was offered the superintendency of his mine.

UNFAIR TO THE MAN WHO FOLLOWS

The story is not told, however, until we learn the final outcome of this procedure. The incoming mine foreman, in each instance, faced a hard proposition when he attempted to maintain the gradually decreasing tonnage and keep down the expense. Naturally, the management thought the new foreman was a far less capable man than the one previously in charge.

On the other hand, the superintendent was in a position to give added support to this conclusion, though he well knew the injustice that was being done the new man. In closing, allow me to say that I like to see a foreman work, first, in the interest of his company and, then, consider the cost. If that don't get him a promotion let him stay a foreman. JAMES THOMPSON,

Mayport, Pa. Mine Foreman.

Miners Must Co-operate

Economy needed in operation of mines —Wasteful practices to cease—Decreased profits call for decreased wages—Duty of every employee to co-operate willingly.

NUMEROUS references have been made, recently, in *Coal Age*, in regard to the need of greater economy in the mining of coal and calling for cooperation on the part of employees, in the efforts of operators to place their mines on a paying basis.

So great has been the expansion of every business, during the war, that few now realize the real meaning of the present condition, which calls for the exercise of great economy. In no industry is this fact more true than in that of coal mining.

During the past year, however, some operators have awoke to the necessity of making greater efforts to put their mines on a paying basis. They recognize that, in order to mine coal at a profit, the strictest economy must be used in every branch of the work.

To all thinking men it is clearly apparent that reduction in wages is now inevitable. There can be no return to normal conditions, unless miners and operators alike are willing to accept the losses that come to all through the downward trend of commodities, in general.

Loss of Profits to Operators Means Loss of Wages to Miners

These losses manifest themselves through the decreased profits of operators and the decreased wages of miners and other employees. The extent of these decreases, in each individual mine, will depend directly on the economy shown in its operation.

It is recognized by all that waste has been allowed to go on unchecked during the past few years when everybody was making money and wasteful practices grew more frequent. Now, things have changed and we are brought face to face with a different condition. The downward trend of the market, owing to a lesser demand and an over production of coal, has made it difficult to operate our mines at a profit.

It should be plain to all that a concern that is making money will do everything possible to operate their mines regularly and give steady work to their employees. Again, a concern that is breaking even will care less whether they operate regularly or not, while one that is losing money will soon cease to operate.

Steady Work at a Fair Wage

Certainly, a man would rather work for a concern that is making money and can give him steady work, at a fair daily wage. That being the case, it is the duty of every employee, working in or about a mine to co-operate in every possible way with the management in their efforts to reduce operating expenses and put the mine on a paying basis.

All wasteful practices must cease and every shoulder must bend under the burden. There are many ways in which saving can be effected and the man who will stop to think will find many things to do to stop wasteful practices and make it possible to operate the mine more economically. F. C. Sinback.

Oak Grove, Ala.

Machine Mining vs. Solid Shooting

Cutting coal with machines gives better grade of lump—Shooting off the solid gives cheaper tonnage—High wage scale and low price of coal require concentration of work.

AFTER reading the many letters of different writers, in *Coal Age*, I have been impressed with the thought that no one man knows it all. There have been a number of good points brought out in the discussions relating to the different ways of mining coal.

An experience of fifteen years in the Western Kentucky coal fields has convinced me that machine operations produce a better grade of lump coal, while solid shooting affords cheaper tonnage; assuming, of course, that a mine is properly equipped for hoisting the coal mined.

The present crisis is a time when coal operators must consider ways and means of lowering the cost of production in every way possible. With the present scale of wages and the low price of coal, many operators are finding it hard sailing. In most instances, the mine equipment was designed when wages were $1.75 a day, which is no match for the present wage scale of three times that amount and more.

Cheaper Tonnage the Only Hope

I have said that shooting coal off the solid affords cheaper tonnage. One reason for this is that it eliminates the employment of many daymen, which every one will agree is an important consideration, at the present stage of the coal industry.

To my mind, the only hope for a coal operation that is not properly equipped to meet the present needs, is to rearrange the machinery. It has become, now, absolutely necessary to provide an equipment that will enable one man to do the work previously performed by three men, and do it with greater ease.

That is the problem of today, let no one mistake the fact. To earn the wages of three men, a man must do three times the work and he must be given the means to accomplish this. There are numerous ways in which work in the mine can be concentrated.

Economy of Mine Labor

Today, I never give a switchlayer a helper, nor put three men on a job that requires but two live men to perform. Of course, we must remember that two men working together can hardly accomplish double the work of a man single handed, except perhaps in a few isolated cases.

What appeals to me as a practical solution of the present problem is to place all daymen, including the mine foreman, on a tonnage basis. This plan would guarantee the operator 100 per cent work, for 100 per cent pay. It is my belief that the results would be surprising.

If such a plan was to be adopted there would be no laying down on the job. Every man would be up and doing, from the foreman to the last man on the payroll. Any laggard found delaying the output of coal would be hounded by all, until he left the place. The plan would tend to give everybody pep. Mine Foreman.

Madisonville, Ky.

Inquiries Of General Interest

Renewing Worn Tires on Mine Locomotives

Tire Expanded by Heating Readily Removed—Likewise New Tires Must First Be Expanded by Heat and Then Shrunk onto the Wheel

DESIRING to rig up some sort of an arrangement for removing worn-out tires from the wheels of mine locomotives, it has occurred to me that mention was made some time ago, in *Coal Age*, regarding such an arrangement. Can you give me any information on this point, or explain how the old tires of a locomotive can best be removed when it is necessary to replace them with new ones?

Holsopple, Pa. Mine Mechanic.

The method of removing old worn-out tires from locomotive wheels, we remember, was explained some years ago in *Coal Age*. No apparatus is required for that purpose, however, the means employed being a simple fire built on the ground surrounding the wheel, which must first be mounted in a horizontal position and in a manner that will permit the expanded tire to be knocked off from the rim of the wheel, if it does not drop off when heated by the fire.

In arranging the fire about the wheel, care must be taken to place it close enough to heat the tire strongly, but not to expose the wheel itself to the heat of the fire more than is necessary. The idea is to keep the body of the wheel cool while quickly heating the tire and causing its rapid expansion. A few blows with a hammer will generally be required to loosen the tire and cause it to drop from the wheel.

The suggestion was once made, by a correspondent in *Coal Age*, that a worn-out tire could generally be removed quickly, by splitting it with a sledge and heavy cold chisel. Preference of these two means of removing a worn tire is largely a matter of choice. The new tire is put in place on the wheel by the same means as that just described for removing the old one.

Keeping the wheel as cool as possible and laying it flat on the ground, the new tire is first expanded by a slow heat that will produce a uniform expansion. At the proper time, the heated tire is raised from the fire and brought over the rim of the wheel. It is then driven in place and allowed to cool, or is shrunk onto the wheel.

Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

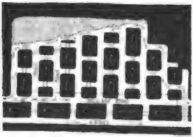
QUESTION—*What is the probable discharge of a duplex, double-acting mine pump whose plungers are 10 in. in diameter and stroke 24 in., the pump making 40 revolutions per minute?*

ANSWER—For a stroke of 2 ft. and a speed of 40 r.p.m., the piston speed is $2 \times 2 \times 40 = 160$ ft. per min., there being two strokes at each revolution, which makes the piston displacement of this pump $12 \times 160(0.7854 \times 10^2) \div 231 = 652.8$ gal. per min.

Finally, the pump being duplex and assuming an efficiency of 85 per cent in the water-end, gives $0.85 \times 2 \times 652.8 = 1{,}109.76$ gal. per min.

QUESTION—*Explain and show by sketch how you would mine a thick seam of soft coal, overlaid with a soft top and lying at a depth of 300 ft. below the surface.*

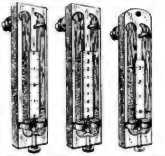
ANSWER—Because of the frail top, this seam should be worked on the pillar-and-stall system. As shown in the accompanying figure, 12-ft. stalls should be driven to the rise of the haulage road, on 40-ft. centers, leaving 28-ft. pillars between the stalls. The stalls should be driven up to the limit, say 50 or 60 yd., and the wide pillars worked out on the retreating system, care being taken to keep the pillarwork in line and to leave no timbers standing.



QUESTION—*Show three forms of graduation of water-gage scales, explaining each.*

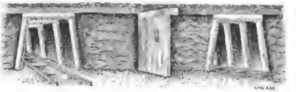
ANSWER—In the accompanying figure are shown three forms of graduating the scale of a water gage. The scale on the right is divided into inches and reads upward, the zero being at the bottom of the scale, which must be adjusted to the lower water level and the reading of the upper water level will then be the gage reading required. This scale must be set after the gage is in position.

Each of the other scales is graduated, from zero at the center, to read both up and down. These scales must each be set so that the zero of the scale corresponds to the water level in either arm of the gage, before it is placed in position and subjected to the difference of pressure between the intake and return airways in a mine. It will be observed, however, that the scale on the extreme left is graduated in full inches, while the one in the center is graduated in half-inches. When reading the former, therefore, it is necessary to take the sum of the two readings at the lower and upper water levels, respectively; or to double either of these readings, provided the scale has been properly set at the start. On the other hand, the reading of the center scale is correct taken either at the upper or the lower level. The reading of each of the three scales shown is 3 in.

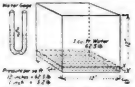


QUESTION—*Explain how a water-gage reading of 1 in. indicates a pressure of 5.2 lb. per sq.ft., as the difference in pressure between the intake and return airways, where the water-gage reading is taken in a mine.*

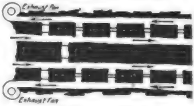
ANSWER—In Fig. 1 is shown a brattice dividing an intake and return airway in a mine. The water gage is shown in position on this brattice. One arm of the gage being bent at right angles and inserted in a hole in the brattice, the water in that arm is exposed to the pressure on the return side of the brattice, while the water in the other arm is exposed to the intake pressure on this side of the brattice. In this position, the reading of the gage gives the difference of pressure between the two airways.



In Fig. 2 is shown a cube, 12 in. on each edge, corresponding to a cubic foot of water, which weighs 62.5 lb. It is evident that an inch in depth of this water will have a weight $62.5 \div 12 = 5.2$ lb. This weight of water, being distributed over a square foot of area, corresponds to a pressure of 5.2 lb. per sq.ft. due to 1 in. of water level. It must be remembered that the size of the container holding the water makes no difference in the pressure per unit area, which depends only on the depth of the water. Therefore, each inch of water-gage reading corresponds to a pressure of 5.2 lb. per sq.ft.



QUESTION—*Assume a gaseous mine is opened on the four-entry system, the main headings being driven four abreast and the butt headings driven to the right and left of these entries. Again, assume, as shown in the accompanying figure, that this mine is ventilated by two exhaust fans, which act independently to ventilate the two sides of the mine, respectively.. Now, suppose one of these fans breaks down and it is possible to ventilate both sides of the mine with the remaining fan, through an overcast connecting the two return airways, what volume of air will result, if each fan working independently before the breakdown produced a circulation of 100,000 cu.ft. of air per minute, making the total circulation produced by the two fans when working independently 200,000 cu.ft. per min.?*



ANSWER—Assuming an equal power driving each fan and equal efficiencies, the power on the air when a single fan is working is but one-half of that when both fans are in operation. Disregarding the slight increase of mine resistance, due to the total circulation reaching the single fan or because of the union of the two splits at a point near the fan, it may be assumed that the mine potential remains unchanged; and the quantity of air in circulation will then vary as the cube root of the power on the air; or $\sqrt[3]{0.5} = 0.7935$. On this basis, the total volume of air, circulating in two splits as before but under the action of a single fan, will be $0.7935 \times 200{,}000 = 158{,}700$ cu.ft. per min.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

INDUSTRY took up considerable slack in March, showing an improvement of 2.5 per cent over February and 7 per cent over July 1921, which was the low water mark in employment, according to the U. S. Department of Labor survey for the month ending March 31, 1922.

"Business will not come back with a jump," the department's announcement states, "but every indication points to a general progressive upward movement. The coal situation may check improvement in certain lines of industry, interrupting a steady healthy swing heading to normal condition. However, there is a general pronounced optimistic feeling that warrants the statement that April will show increased activity, other than in coal and cotton textiles.

"Employment increased in all industries with the exception of food and kindred products, textiles and their products, and leather and its finished products. The basic industries iron, steel and metal products; vehicles for land transportation; railroad repair shops; paper and printing; stone, clay and glass products, and tobacco made substantial gains.

"Reports from 231 of the principal industrial centers indicate an active building program of which the encouraging feature is the increased number of residential constructions. Agriculture is rapidly coming back, and there is an increased demand for experienced help.

This monthly survey is based on actual figures taken from the larger industrial payrolls of the country. The statistics are gathered each month by the department's special agents in 65 principal industrial centers. In all, 1,428 firms each usually employing more than 500 workers are comprised in the survey. On March 31 these 1,428 firms had 1,604,959 employees on their payrolls, compared with 1,565,401 on Feb. 28, an increase of 39,558, or 2.5 per cent.

Of the 65 cities, 43 reported employment increases during March over February, with percentages of increase varying from 0.95 in Philadelphia, Pa., to 28.2 in Denver, Col. Twenty-two cities reported employment decreases during March over February, the percentages of decrease being from 0.09 in Louisville, Ky., to 17.2 in Paterson, N. J.

Mid-Atlantic Revival Under Way

A gradual and steady industrial advance during the past two months, together with current reports of increased activity in basic industries throughout the Middle Atlantic district strengthen the conviction that a revival in the general situation is under way. While general conditions are still somewhat irregular, the main trend of business has shown a gradual improvement, supported by prospects of further gains; added reason for a more hopeful feeling appears in a continued increase in operations of the iron and steel industries, diminishing unemployment of skilled and unskilled labor, and expansion of building operations. Reports from many sections of the district show the anticipated building boom is under way, which is further evidenced by increased activity in structural mills and fabricating plants.

INDUSTRIES REPORTING AN INCREASE IN EMPLOYMENT IN MARCH, 1922

Industries	Amt. of Inc.	P.c. Inc.	Weight*
Vehicles for land transportation	15,246	8.4	12.3
Iron, steel and their products	17,930	5.3	22.3
Metal and metal products	4,084	4.9	5.4
Miscellaneous	10,746	4.2	16.7
Stone, clay and glass	264	1.8	0.94
Lumber and its manufacture	382	1.6	1.5
Railroad repair shops	933	1.5	2.9
Tobacco manufacture	441	1.4	1.9
Liquor and beverages	4	0.46	0.05
Paper and printing	175	0.34	3.1
Total	50,204		

INDUSTRIES REPORTING A DECREASE IN EMPLOYMENT IN MARCH, 1922

Industries	Amt. of Dec.	P.c. Dec.	Weight*
Leather and its finished products	2,668	4.6	3.4
Textiles and their products	5,511	2.2	15.4
Chemicals and allied products	931	1.2	4.6
Food and kindred products	1,536	1.2	8.2
Total	10,646		

*Per cent employed March 31 to total reported employed in 14 groups

New England Optimistic

Except in the textile industry, which is uncertain on account of industrial disputes, a general feeling of optimism is sensed throughout the New England States. Unemployment is heaviest in metals, machinery and building trades. Woolens and worsteds have curtailed production during the past few weeks. The shoe trade has experienced the usual seasonal spurt due to Easter orders. Retail sales for the past month showed a slight increase over the receipts of February. Building reports for the six New England States give value of contracts awarded as $15,623,400. Of this amount $4,463,100 was for residential buildings.

Fewer Idle in South Atlantic Region

Reports from 30 cities in this the South Atlantic district continue to show steady gain in employment with the outlook for more rapid improvement within the next 30 days.

Midwest Manufacturing Gaining

Steadily increasing output of iron and steel and higher prices of farm products have been the most encouraging factors in the business situation within the last thirty days. Until these lines are well under way again, business can only mark time. Unemployment will only give way by small percentages. The manufacture of machinery is receiving stimulation from the large orders recently placed by the railroads, from the automobile industry, from recent quickening of activity in farm implements and prospective activity in road building. The furniture industry is in very good condition.

South Central Conditions Improve

Industrial and employment conditions are improving slowly but surely in the South Central districts. Actual payroll data received from 556 industrial concerns representing most all of the 14 groups of industries employing 84,598 show a net increase for the month of 273. Seventy per cent of the textile mills are running full time, 25 per cent part time and 5 per cent shut down. Fifty per cent of the lumber mills are running full time, 35 per cent part time or with reduced forces and 15 per cent shut down. Building is showing a decided increase in volume. All classes of building material are in fair demand. Manufacture of cotton, silk and wool textiles has dropped off in recent weeks. In the tobacco growing regions conditions have changed considerably for the better over last year and in the cotton-growing states the sharp recovery of cotton prices has aided that section materially.

Hoover Enunciates to Trade Association Officials Unalterable Opposition to Open Price Reports

TRADE association secretaries, executives and members gathered in Washington on April 12 to discuss with Secretary Hoover and the officials of the Department of Commerce how to save the trade association. Ever since the Supreme Court handed down its decision in the Hardwood Lumber case a slow disintegration of such associations has been discernable. The Department of Commerce has taken an active and helpful interest in the association movement and some time ago obtained from the Attorney General an expression of what in his judgment the proper activities of trade associations are. The correspondence between Mr. Hoover and Mr. Daugherty (*Coal Age*, Feb. 16, pp. 297-300) cleared up some of the problems of the secretaries, but there were so many left that the meeting of last week was called to have Mr. Hoover throw more light on the troublesome subject.

After all, it appears, the chief trouble is and has been that the question of "open price" reports is of most interest to present-day associations. In other words, the secretaries have found no very great difficulty in keeping the other aspects of their work going, but without the open price reports many have come to the conclusion that they cannot hold their organization in line. The open price report has come to be considered as the feature of greatest immediate value to members—something that they can use and get their money's worth on short notice.

This the Secretary will not support with the facilities of the Department of Commerce, as was made clear by Mr. Hoover in his opening address and a number of times later in the course of the conference. His letter to Mr. Untermyer, elsewhere in this issue, is plain on this point. There was no open opposition from the floor to this position, but some disappointment was expressed in the corridors.

ATTENDANCE TOO LARGE FOR COMMERCE BUILDING

The conference was held in two sessions, both in the auditorium of the Interior Building, after it was found that the attendance was too large to be accommodated in the largest room in the Commerce Building. The addresses from the floor were largely laudatory of the association movement, of Mr. Hoover, and of the work that is being done by the Department of Commerce to aid business and rebuild the trade association. Representatives of the U. S. Chamber of Commerce, the National Association of Manufacturers, the Automobile Chamber of Commerce and many national associations were speakers. A paper read by E. J. Cornish, representing the National Paint, Oil & Varnish Associations, Inc., was hailed by the audience as so expressive of the feelings of those present that it is reprinted herewith in full.

Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce, and Mr. Durgan, of the Division of Simplified Practice, expressed a willingness on the part of their bureaus to work with the legitimate trade associations. Dr. Stewart, of the Census, said that it was a tremendous job to gather and publish promptly statistics of all the country's industries.

Chairman Gaskill of the Federal Trade Commission suggested that the trade associations give closer attention to the competitive system under which society was organized, a system whose purpose was to give the greatest measure of social justice to all. Monopoly was destructive to competition, and all things tending toward monopoly must be weeded out. It was not a question of too much government in business or vice versa, but of the closer co-operation of both, to mutual advantage.

Secretary Hoover called upon Senator Edge, who said that he felt business should know where it is at, and to that end had introduced a bill designed to aid the trade associations in defining their activities. Co-operative help from Congress is as necessary to business as it is to agriculture, he declared.

The solicitor of the Department of Commerce emphasized the voluntary nature of the support from trade associations, and that the department had no means of compelling or desire to compel them to give their aid or conform to certain regulations. Secretary Hoover in his closing remarks said that the conference was merely a meeting for information and education and was not sufficiently organized to go into details. He was ready to meet each association with its individual problems and to go into details with it. He stated that only about one-third of the associations compiled trade statistics and that the Department of Commerce has never attempted to impose a statistical service upon the associations. The voluntary statistical contributions of trade associations were gladly received and used. Mr. Cornish's address follows:

"In the great mobilization of industry during the war, many manufacturers found themselves, in company with their competitors, arguing that theirs was an essential industry—properly entitled to coal and transportation. They also found themselves submitting cost sheets on forms approved by government officers, and reporting location and capacity of their plants, annual output, stock on hand, sales and prices. There was no preconceived plan to form a trade association—it simply took form and became. Everyone's secrets—if anyone had any secrets—were, of necessity communicated to his competitor—the only one from whom he desired to conceal them. Everyone was surprised to learn that his competitor was not a liar or a crook (as he had frequently been represented to be by salesmen) but, on the contrary, was a gentleman imbued with the same ideals of business ethics as himself, and very companionable by reason of their mutuality of interests. What was more interesting and surprising was that they found that the disclosures of their innermost secrets did not prove to be damaging, or rather they found that secrets of real value were already known to their competitors.

SUMMARIZES ADVANTAGES OF TRADE ASSOCIATIONS

"At the close of the war the associations were naturally continued because they had proved injurious to none, advantageous to all. The advantages of the association are:

"(1) It enables each one to know the basic facts of his own and kindred industries, so that in forming his own business policies he may act intelligently and safely.

"(2) It raises the standard of trade ethics. No man ever does that of which he is ashamed if he knows that in the near future he will meet a gentleman whose good opinion he desires, who will know of the shameful act.

"(3) It gives stability to business. As Judge Carpenter expressed it, 'It enables one to sleep of nights.' This not as the result of an agreement or understanding, but because —where all of the important facts are known—reasonable men are not likely to draw therefrom radically different conclusions as to what their business policy should be.

"(4) It permits those countless economies and advantages possible to voluntary co-operation where each one retains complete freedom of action. Among these are research and educational work, gathering of trade statistics and information, co-operative trade promotion and advertising, standardization of products and containers, co-operative insurance, reformation of trade practices, transportation and classification charges, protection of industry from the evils of adulteration, deceptive advertising and other frauds, etc.

"It has been generally understood that such associations are not illegal if there is no agreement or understanding fixing prices, limiting output or dividing territory, and that the information given as to prices and stocks was statistical, referring to past and present facts that could not then be changed.

"The criticism of these associations has been that they resulted in higher prices, tending to increase the cost of living, and that the good features of the associations were mere camouflage to hide illegal combinations in restraint of trade.

"Of course, in so far as the associations brought competitors into each other's presence, they created an opportunity to make illegal agreements or understandings. The same would be true of a convention or dinner or any other occasion where competitors meet. Probably the number of illegal combinations has been greatly exaggerated. Such illegal agreements are not at all necessary to the usefulness of the associations. The fact that most of them invited attention and criticism by sending minutes of their meetings to the Federal Trade Commission indicates a belief on their part in their own innocence.

"There is absolutely no evidence that prices have been unduly increased by these trade associations. There are no companies, members of such associations, whose published statements indicate that they have been making undue profits. Many associations ceased to function in the spring of 1920, when their legality was questioned by the Attorney General. Prices of manufactured articles have not declined since then to any greater extent than can be adequately accounted for by the decline in the costs of doing business. High compensation to laborers, office force, salesmen and managers; high rents; increased freight rates; high and uncertain taxes—these facts account for high prices and high cost of living, without attributing crime to any one. The belief that trade associations are simply price-fixing associations in disguise is so prevalent, however, that suggestions are multiplying as to the means of preserving the advantages of such associations without the possibility of any of them degenerating into illegal combinations in restraint of trade.

Discusses Proposed Protective Measures

"Three remedies have been proposed: First, the repeal of the Sherman law. Without doubt, the Sherman law has removed two of the most frequent inducements to price cutting. Under free conditions, competitors do not cut prices just to be competing; they do so because they believe it to be advantageous. One frequent inducement to price cutting is to reduce the profits in the industry to such an extent that a competitor's properties can be bought at less than their value. Another inducement to price cutting is to demoralize business to such an extent that competitors will buy out the price cutter—not at the proper value, but at the 'nuisance value' of his properties. The Sherman law effectively removes these two inducements to price-cutting. In like manner, everyone desires that inasmuch as he himself cannot buy the properties of a competitor, anyone who does so shall pay the highest price obtainable therefor, so as not to have a new competitor embark in the business at a reduced capital investment. The Sherman law, therefore, furnishes an inducement to the stronger competitor not to reduce prices to a point that would cause the lesser competitor to fail.

"Of course, such reasoning is shallow and shortsighted. Sherman law or no Sherman law, sooner or later every company will learn by experience that, to give permanency to its profits, its prices must be so low that new capital will be deterred from embarking in the business—even though the aggregate of the small profit, per unit, makes the total profit of the large established business satisfactory. Inasmuch as the public believes the Sherman law advantageous, and both large and small companies look upon it as a protection, and the farmers and laborers have been exempted from its operation, no one actively seeks its repeal, except students of political economy, who have only a general interest in it. Its repeal, therefore, is not likely to be seriously considered, notwithstanding the very able arguments appearing in the press.

"Another proposed remedy is to empower the Federal Trade Commission to license and regulate all trade associations and prescribe definitely and clearly what such associations may or may not do, and prevent the functioning of all associations not so licensed. This plan has been highly commended by many, and may prove to be the least objectionable solution of the trouble. The criticisms of it are that it is essentially communistic. It is another form of state control and state interference with business freedom. The commission might come under the influence of the people to be regulated or might become tyrannical and demagogic, and influenced by political considerations. It is impossible to state at this early date what the reaction of the public to this plan will be. Diminishing profits and the tendency of states to find ways to tax and impose restrictions and espionage on corporations engaged in interstate commerce are inclining many business men to favor federal incorporation or federal licenses to do interstate business. While such centralization of power in any governmental body is theoretically objectionable, it might be much more satisfactory than to be subjected to the interference of several federal departments and of many states.

"The last proposed remedy is to permit trade associations to gather the information desired, so that the members may have comprehensive, authentic and timely information as to the basic facts of their business—subject to the restrictions of the laws against agreements and understandings in restraint of trade as developed by the courts and subject also to the provision that such information shall at the same time be tabulated and published, and made available alike to producers and consumers. It is believed that the advantage of knowledge of all essential facts which each one must give regarding his own business in order to get similar information from others and make the aggregate statistics accurate and useful, would be sufficient to induce everyone to contribute his quota of information. Publicity would prevent any association doing anything deserving of censure. This remedy requires no new laws. It leaves business relatively free.

"At one time it was believed that the Federal Trade Commission had jurisdiction to receive reports and take appropriate action in case it found an agreement in restraint of trade existed. If publicity had been required, there probably never would have been criticisms of a trade association. The information gathered by trade associations is necessary to the efficiency of the Secretary of Commerce and the Federal Reserve banks, and I sometimes think that the legislative and judicial departments of the government would act with greater wisdom if the statistical information gathered by these associations were published and accessible. Every trade paper seeks it. Every writer on economics must have it. As stated, it needs no new law; but simply to educate the courts and legal departments of the government and states that there is a good reason for such trade associations, other than the opportunity they present to form agreements in restraint of trade."

March Hard-Coal Shipments, 6,778,667 Tons; Total for Coal Year, 67,039,037 Tons

Shipments of anthracite during March, 1922, as reported to the Anthracite Bureau of Information, Philadelphia, amounted to 6,778,667 gross tons, an increase over the movement in February of 1,539,652 gross tons and over the month of March last year of 1,040,896 gross tons. March, 1922, stands third as a record for that month, shipments in excess of this figure being made during the years when the anthracite industry reached the high water mark, a record of 7,276,777 gross tons being established in March, 1918, and 6,989,075 gross tons in March, 1917.

The total shipments for the coal year ending March 31, 1922, have amounted to 67,039,037 gross tons, as compared with 69,366,731 gross tons shipped during the previous coal year ending March 31, 1921.

Shipments by originating carriers were as follows, in gross tons:

	March, 1922	March, 1921	Coal Year, 1921-1922	Coal Year, 1920-1921
Philadelphia & Reading	1,372,024	1,018,858	13,319,886	13,952,192
Lehigh Valley	1,220,563	1,022,714	11,647,083	12,580,764
Jersey Central	654,679	540,556	6,632,425	5,674,767
Lackawanna	1,047,622	1,020,381	10,218,329	10,140,295
Delaware & Hudson	909,261	837,644	8,998,519	10,195,735
Pennsylvania	523,273	333,687	4,927,204	5,240,868
Erie	654,492	561,013	6,881,690	6,504,683
New York, Ontario & Western	154,681	144,930	1,548,303	1,999,761
Lehigh & New England	242,072	257,988	2,865,598	3,077,666
Totals	6,778,667	5,737,771	67,039,037	69,366,731

Legitimate Trade-Association Work Is Vital and Should Be Encouraged, Says Hoover[*]

Canvass of Nearly Two Thousand Organizations Shows Only Small Minority Engaged in Activities on Which Restraint of Trade Is Founded —Economic and Social Results to Commerce Should Be Guiding Factor

WHILE the efficiency and ability of our individual business men and industries are of a high character, there are many questions of general interest that they cannot compass without common action. This has resulted in the organization of our Chambers of Commerce and associations among bankers, merchants and manufacturers parallel with associations of farmers, lawyers, doctors, engineers, workers and many other groups.

The multiplication during the past twenty-five years of literally scores of hundreds of associations in these activities means a groping for some vital necessity in our whole system. The benevolent results to the community obtained in thousands of instances is proof of their value. One of our constant national problems is how to obtain these benevolent results of such co-operation without creating dominations of groups that would stifle equality of opportunity; to obtain them without loss of individual initiative; to obtain them and still maintain that competition among individuals which is the sustaining impulse toward progress. I do not believe these things are incompatible.

The legitimate associations in industry and commerce have been well proven to be in public interest. We need only to examine the many functions of the two thousand organizations to demonstrate this.

MULTIFARIOUS ACTIVITIES OF TRADE ASSOCIATIONS

Chambers of Commerce and trade associations have in their own fields concerned themselves with the promotion of our foreign trade, with better preparations of goods to meet the necessities of different markets, with securing of credit information in foreign markets as to foreign dealers, with the dissemination of information as to possible demands, with the supply of goods from competitive countries, the character of these supplies, the customs regulations, transportation of goods, port and warehouse conditions, support of our merchant marine and a thousand items that make for the advancement of our foreign commerce.

They have concerned themselves with the collection of domestic credit information, with the handling of insurance in different forms for their members, with standardization of quality and grades of their commodities and products so that the public may have reliable grades, and some have supported inspection to see that these qualities are maintained. They have concerned themselves with simplification of trade terms, elimination of unnecessary varieties in dimensions of different articles, with conduct of arbitrations, with joint advertising of products of the industry, with securing prevention of infringement in trade marks and designs, the promotion of welfare work in the organization of employees, with employment insurance, with the problems of apprenticeship and trade education and the prevention of accidents. They have raised the standards of business ethics in many trades. They have concerned themselves with representing the views of the trades in legislation on tariff, taxes, transportation, etc. They have concerned themselves with freight rates, overseas transportation charges, uniform bills of lading, with statistics as to production and stocks of goods, with scientific accounting, selling and with scores of other activities, all of which make for improved business practice.

It would be possible to demonstrate that these activities have resulted in great savings in costs of production and distribution amounting to enormous sums of benefit to both producer and consumer.

Furthermore, our costs of distribution and manufacture have increased greatly due to increased taxation and other burdens we cannot avoid. If we would reduce these charges and thereby enable farmers to buy more and to increase our employment, we must advance in every direction to further decrease these costs and eliminate wastes that we can find.

There is one generalization in connection with this movement that has been mostly overlooked. The trade association in membership is predominantly made up of the smaller establishments. Big business can employ its own agents in all these matters. It can establish its grades and standards, it can employ its own research laboratories. Little business can only hope to be equally informed and make equal efforts to promote its welfare through trade associations.

The law provides that the Secretary of Commerce shall promote trade, industry and transportation. In the reorganization of the Department of Commerce that it might become of far greater real service to our whole public we have sought to co-operate with industrial and commercial organizations, agriculture and labor in promotion of marketing abroad, in employment, in transportation, in elimination of wastes and improvement of our industrial technology, statistical services and information, and in many other directions.

These problems become practical problems of day-to-day contact with commerce and industry if we would learn the direction in which real service can be accomplished. Such contact can be obtained only through trade and industrial organizations, for without organization there can be no representation. We hold that legitimate trade-association work is vital and should be encouraged.

A FEW GROUPS HAVE CAST SUSPICION ON ALL

Certain doubts have been raised as to the right purpose of all trade associations during the past year by the exposure of a few groups that have taken advantage of the benevolent purposes of trade-association work as a cloak to create combinations through which they not only restrained trade but some of them also became the nuclei of corruption. I wish to state at once that a canvass of nearly two thousand trade associations showed that only a small minority were engaged in those functions which lay the foundations upon which restraint of trade is suspicioned.

Recently this department addressed to the Attorney General certain questions for its guidance in its relation to various functions of associations and received his views thereon, which have been communicated to the public. I cannot, nor would not, add nor subtract anything from what the Attorney General has stated. This conference was called at the request of many associations who wished to present their views upon the relations of their associations to this development. This department cannot interpret the law and has no intention of doing anything of the kind.

It is obvious that the Department of Commerce cannot establish co-operative relations with associations who maintain types of practices that have been condemned by the courts. Beyond this again there are some two or three functions carried on by a small minority of trade associations the legality of which has been questioned but not yet determined. These are in the main the so-called open price associations, which are collecting data on prices and sales of their individual members, and circulating such individual data again to their members together with certain other activities.

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[*] Address delivered by the Secretary of Commerce before the Trade Association Conference, Washington, D. C., April 12, 1922.

I wish to state frankly and at once that the officers of the government do not believe that these functions are in public interest, whether they are used in violation of the law or not. The department laid down the rule nearly a year ago that it could not co-operate with associations subject to such criticisms and sees no reason to change it.

The labor unions solved this matter in obtaining legislation giving them practical immunity from the restraint-of-trade laws. Lately the farmers have done the same. The commercial and manufacturing community has not asked for more than some interpretative help in questions along the twilight zone of trade restraint. The Federal Trade Commission was originally conceived in the sense of providing some measure of interpretation of the law, but these provisions were largely stricken from the original legislation.

Lately Senator Edge and Congressman MacArthur have introduced into Congress a proposal for a joint Congressional inquiry to be held for the purpose of considering this situation. I believe it would be in public interest if the experience of recent years were inquired into by such a committee. The problem is not one of purely legalistic interpretation, for in the final analysis much must depend upon the economic and social results to the community. The whole commercial community is vitally interested in the limitation of co-operative action in the necessary prevention of restraint of trade. It is the duty of this department to study the economic effect of the law and we are glad to have your views in the matter. The real problem is to avoid destroying the good in uprooting the evil. Men have been murdered with brickbats, but that is no reason for prohibiting brick houses.

Features Attacked Are of Minor Importance

But after all, these questions of the twilight zone are quite secondary. The functions that are challenged are so small a part of trade-association work and so unimportant in the larger matters of commerce and industry that the associations in vast majority concern themselves with.

In the matters of day-to-day co-operation that go on in connection with trade organizations I wish to emphasize that the efforts of the department are purely co-operative. They are not imposed upon anyone. We do not want any relations that are not based upon an expressed wish to establish such co-operation in the advancement of the different industries. I propose to have the details of the bureaus of this department, which need co-operation by the associations, more fully presented by our department heads later on.

I would give this review. Our foreign trade is one of intense and different technology in every different commodity. Moreover, the laws, customs, transportation, the demand and supply problems vary with every commodity in every country in the world. Congress over many years had given support to a large foreign staff seeking to serve the American farmer, manufacturer, exporter in these matters. These staffs were comprised of men of general trade knowledge but they were not specialists. No mortal could possess the special training required for all commodities for all countries. Congress, therefore, approved our recommendation that the Foreign Trade Division of the Department of Commerce should be divided into specialized branches. Even something more than specialists in a department were needed, for we must obtain intimate contact with the men in the different industries themselves. We, therefore, co-operated with several trade associations to appoint special committees who should give direction and strategy to our agencies abroad on behalf of the whole industry. The result has been to place these energies in the channels where the sale of actual goods has been promoted; to dictate the character of information needed for their special trades, to promote the economic handling and reduction of risks in foreign business.

This basis of co-operation so far as has been developed is beyond our highest anticipations. The growth of inquiries from the commercial public to this division from a few hundred daily to several thousand daily is only one evidence of the usefulness of this co-operative effort. I do not wish to lay too much emphasis on this service; it is worth noting that our foreign trade has decreased in less proportion to prewar than that of the other nations of the world and I believe the devoted work that we have received from American business men in this particular has saved us from much larger decreases and promises much for the future. We would be glad to extend it to other industries.

Another field where we have entered into joint work with various trade associations is in the advancement of their efforts at simplification of trade terms, in the simplification of general specifications, simplification of dimensions of many and varied products, all of which makes for cheaper production, cheaper distribution, emphasizes competition and ultimately benefits the consumer as well as the producer.

We have co-operated in carrying out investigations into the technical processes of manufacture with many different industries, thus having the advantage of men of practical experience from the trade associations in co-operation with our scientific staff. The whole of this field of elimination and utilization of waste is one of the most important before our commercial and industrial development and one that can be accomplished only by co-operative effort on scientific lines.

The third field in which we have had much co-operation has been in the development of the government service devoted to publication of statistics on production and distribution of commodities. These services had existed in the government for many years and the problem was to make the materials of greater value to the commerce of the country. In these matters we have had the co-operation of many trade associations. These services need further development in the interest of the whole community. Statistical information as to productivity and national stocks is needed not alone by the man in a particular industry but the same information is needed by men in other industries and it is needed by every agency of the government. A study of the trend of production and consumption does not imply restraint of trade. If it does then the whole statistical basis of commerce that fills one-third of our newspaper space would need to be abolished. If we abolished it we would be bankrupt in ten years. The matter that I am principally interested in is that this information should be available to the whole public. It is the old question as to whether a community will succeed if it acts in ignorance or if it acts in knowledge.

Appropriation Amendment Forbids Court Proceedings Against Striking Miners

On a second attempt, Representative Johnson, of Kentucky, was successful in obtaining the adoption in the House of an amendment to the Department of Justice appropriation bill forbidding the prosecution of labor unions or associations of producers of farm products under the anti-trust act. The measure is designed to prevent court proceedings against striking miners. In committee of the whole the House by a vote of 27 to 26 adopted the Johnson amendment. In the House an attempt to obtain a separate vote on this amendment failed, and it was incorporated in the bill, which now goes to the Senate for action.

The amendment forbids the expenditure by the department of any sum in the prosecution of any organization or individual for entering into a combination or agreement having in view the increasing of wages, shortening of hours or bettering the conditions of labor or for any act done in furtherance thereof not in itself illegal, and forbidding prosecution of producers of farm products and associations of farmers who co-operate to obtain and maintain reasonable prices for their products.

Representative Husted, of New York, said he was opposed to class legislation, of which the Johnson amendment was the "rankest kind," and he desired to emphasize it by offering an amendment covering mineral producers, including, of course, coal operators. Mr. Husted's amendment was defeated, whereupon the Johnson amendment was adopted.

The Second Week of the Coal Strike

EDITORIAL REVIEW

If there is any one thing outstanding in the second week of the strike it is that the interest of the public is waning. From front page headlines to obscure single column heads in the back of daily papers in one week marks the progress of its popular appeal.

There are two spots in the country where the strike is beginning to cause some apprehension. One is the steel industry in the East, the coal supply of which has been affected by the marked progress of the union in cutting off non-union production in the Connellsville regions. The other is in and around New York, where large consumers, particularly public utilities, whose source of supply of non-union coal from central Pennsylvania is now largely if not wholly cut off by strikes. In both cases the situation at the moment is in the uneasy stage. New York drawing on Hampton Roads for coal to replace that lost in central Pennsylvania and the steel interests drawing on eastern Kentucky and the high-volatile fields of southern West Virginia are the only features that lend any strength to the coal market, which everywhere else throughout the country is characterized by lack of demand and weak prices.

In West Virginia the operators are attempting through the use of the injunction to hold the union in check and to prevent the spread of the organization to the non-union fields. Four temporary injunctions were granted last week by the Federal Judge at Charleston, none of which has as yet been made permanent.

The shutdown in union fields continues as complete as in the beginning. Lack of market continues to limit output in southern West Virginia, Virginia and other non-union fields of the South. The New River field is not actually entirely shut down but practically so.

There are no indications anywhere of a break in the ranks either of the operators or of the union. The anthracite miners and operators in their negotiations in New York have made no progress and are generally supposed to be deadlocked, neither side so far indicating any inclination to bargain.

The federal intervention that John Lewis is understood to have promised the bituminous miners as the road to victory for them is no nearer now than a month ago. Attorney General Daugherty by his enigmatic statements before and after consulting Judge Anderson at Indianapolis has not helped to clear the air. If Mr. Daugherty has said anything it is that the miners and operators would be courting another indictment were they to make another joint agreement.

Brophy Explains Violation of Rule 25

John Brophy, president of the United Mine Workers of District No. 2, in a communication to Governor William C. Sproul, of Pennsylvania, on April 10 entered a protest against the manner in which it is alleged that the state police are being used against the miners now on a strike in the district. He also protested the eviction of union miners from non-union properties where they have gone on strike.

In his answer to the charges made by the Central Coal Association that the strike in central Pennsylvania is a violation of Rule 25, he makes it clear that the miners will stand firm, as shown in this excerpt from his statement:

"There are two facts in the present crisis—a big fact and a little fact. The big fact is the notice of wage reductions posted at the mines—a printed placard with reductions of from 32 to 54 per cent. This is the expression of the earnest efforts of the operators for the last twelve months. The little fact is a clause in the scale agreement, a clause which they use as a talking point to divert public attention from the drastic attack on the wage and living conditions of the miners. The clause is Rule 25 of the scale agreement.

"Rule 25 is contingent on the uniform and unbroken practices of collective bargaining in the the industry. Rule 25 was inserted in the district agreement in 1912, in order to give the district time to negotiate an agreement after the basic rate had been set in the Central Competitive Field. It assumes that contract negotiations are under way there to provide a basis for the outlying districts.

"If no negotiations are under way in the Central Competitive Field, there is no Rule 25. The Central field negotiations are the hook on which Rule 25 hangs.

"The use of the Central Competitive Field as a national basing point represents the industry's one great advance over the cut-throat competition and chaos of unrelated local and district agreements. We agree with certain operators that the system is imperfect, but the way to remedy these imperfections is not by going backward to discarded methods but forward to a national basic agreement."

Shows Central Pennsylvania Men Earn $1,319 Yearly; Union Alleged $760

G. Webb Shillingford, president of the Central Coal Association, has issued a statement in which he stated that his association has made a study of the annual earnings from 1914 to date for all employees in the mining industry, and it discloses the following results:

AVERAGE EARNINGS (FULL TIME) OF BITUMINOUS MINE WORKERS IN CENTRAL PENNSYLVANIA.

(Includes tonnage and day workers except superintendents, mine foremen and clerks.)

Year	Net Tons	Days Wkd.	Employees	Per Day When Mine Works	Monthly Earnings	Yearly Earnings	Total Earnings
1914	48,692,353	202	62,389	$3.32	$55.92	$671.09	$41,868,785
1915	52,202,406	207	59,276	3.66	63.10	757.16	44,881,193
1916	56,063,852	240	55,196	3.77	75.42	905.06	49,955,476
1917	58,658,817	239	59,166	4.81	95.75	1,148.99	67,980,850
1918	60,515,118	259	56,768	5.77	124.58	1,494.92	84,863,708
1919	46,546,381	194	56,413*	6.04	97.66	1,171.86	66,108,240
1920	58,172,416	226	56,413*	8.35	157.29	1,887.46	106,477,140
1921	39,165,074	138	56,413*	9.56	109.95	1,319.42	74,432,160

Absenteeism: Tonnage workers, 17.6 per cent; day men, 8.8 per cent.

Number of days worked and number of employees taken from Pennsylvania state report.

* Estimated.

This table shows that men working during the year 1921 earned $9.56 for eight hours, or about $1.20 per hour, while the rate for workmen in building state roads is only 30c. an hour.

Mr. Shillingford said that if the coal-consuming public were willing to pay $9.56 for eight hours work, the miners are right in this fight. If they believe that wages in the mining industry ought to be placed upon a parity with wages in other industries, the operators are right.

The statement made by the representative of District No. 2, United Mine Workers of America, before the Labor Committee of the House of Representatives, that $760 was the annual earnings of miners in this district last year is absolutely untrue, and the witness admitted on the stand that this figure did not include wages paid for day labor, which is 35 per cent of the total cost, cutting and scraping, pushing cars, yardage and deadwork or extra pay for deficiencies.

The principal reason given by the United Mine Workers of America for the maintenance of the war-wage scale, and their demand for a six-hour day and a five-day week is intermittency of employment suffered by the mine workers. A great deal of the loss of working time suffered by the union mines of central Pennsylvania during the year of 1921 was caused by business being taken away from the union mines and absorbed by the mines that had made the necessary wage readjustments. It is an admitted fact that the coal-mining industry is overdeveloped and overmanned. The question of overdevelopment is a matter of individual investment and the exercise of the American right to enter into any legitimate business which the operation of natural economic laws will adjust.

The excess number of men employed in the mining industry is due in a large measure to the very high wage rates paid in the coal mines of the country, as compared with the wages paid in any other industry employing such a large percentage of common labor, thereby attracting men to the industry.

Windber miners to the number of 2,200 met last week at Scalp Level and organized a local branch of the United Mine Workers of America. They elected James R. Murray, president; James Gibson, vice-president; Patrick Ryan, recording secretary; Stephen Foster, financial secretary; Martin Madigan, treasurer. The Windber local is made up of men from the Berwind-White mines.

More Injunctions

UNION activities in all the smokeless fields of West Virginia and in one high-volatile district were under the ban by the end of the second week of the strike, Judge George W. McClintic, of the District Court for the southern district of West Virginia, having granted two more injunctions on Friday, April 14, in addition to the two issued by him on April 8 and 10. The third and fourth injunctions restrain all union activities in the New River field, which toward the end of the second week of the strike had become the scene of several acts of violence having for their purpose the intimidation of non-union miners.

The fourth injunction was obtained by the Aetna Sewell Smokeless Coal Co. and 62 other companies in the New River field.

In addition to union officials the injunction named as a defendant the Very Top Seam Coal Co., which company has recently been collecting the check-off. The third injunction was obtained by six other coal companies, applying specifically at their plants.

The injunction prohibits any attempt to create a monopoly of labor which might have a tendency to unreasonably increase the price of labor and also prohibits the use of money, *persuasion*, menaces, force, intimidation, violence, counsel or any other means whatever to cause laborers to join the mine workers' union. Furthermore, mass meetings are prohibited, as are marches in the different fields. The assemblage of miners on property belonging to the coal companies is specifically prohibited.

Keeney Defiant Toward Injunction

AMONG those who will face trial at Charles Town, W. Va., on April 24, charged with various offences, are C. F. Keeney, president of District 17, Fred Mooney, secretary of that district, and William Blizzard, president of a subdistrict. Indictments against some of the two hundred or more defendants who will face trial charge treason, murder, insurrection and conspiracy and it is understood that the prosecution in some cases at least will ask that the extreme penalty be imposed.

Notwithstanding the serious charges which Keeney and his associates must answer, he appears to be in a mood to defy the injunction which Judge McClintic issued on April 10 in order that the Mingo tent colonies be dismantled and those living in such colonies be disbanded, and that all union organization work be suspended.

Northern West Virginia Operators, Restating Position, Deprecate Miners' Resolution

EXCEPTION has been taken by the Northern West Virginia Coal Operators Association to a set of resolutions adopted by miners at Kingwood, W. Va., and sent to President Harding asking that he compel the operators to negotiate with the miners, the protest of the operators being based on the fact that repeated efforts were made before the strike to negotiate a scale with the miners and two conferences held, all of which were without result because the miners of this field were not permitted to negotiate a separate agreement.

The gist of the protest made by northern West Virginia operators is that they have already sought conferences with the officials of District 17. Their position is set forth in the following statement by Secretary George S. Brackett:

"This strike, or cessation of operations, or whatever the miners may call their walkout, is something beyond us entirely. We have tried our level best to find out what the strikers want. They are not striking over wages, hours, working conditions or anything that we could adjust. They simply refuse to meet us, and are using West Virginia as a pawn in the game to chastise the operators of Ohio, Indiana, western Pennsylvania and Illinois. Our mines are closed and our men are idling merely because the miners' leaders cannot get an agreement from operators in states that have absolutely nothing to do with us. Less than 6 per cent of our coal competes with the coal from those states and our conditions are entirely different. We have twice sought meetings with our men's representatives to explain this, but they refused to discuss the matter. Now they, at the meeting in Kingwood, give the impression that they want the public to forget their refusal.

Anthracite Operators Withhold Announcement of Wage Cut They Will Demand

NOT much progress was accomplished by the joint subcommittee negotiating a wage scale for the anthracite mine workers at the three sessions of that body held in New York City last week. On April 13 an adjournment was taken until April 18 to enable both operators and miners to spend the Easter holidays at their homes.

During the three sessions of the committee the issues involving the establishment of wage rates where mechanical loading is done, the establishment of uniform wage rates for the same class of work and the demand of the miners asking payment for all sheet iron props, timber, forepoling, extra and abnormal shoveling and cribbing were discussed. Discussion also was had on the demand of the miners that where coal is paid for by the car it shall be changed and payment shall be made upon a legal ton basis or 2,240 lb. and that the dockage shall be eliminated.

During the week informal statements were issued by both sides in which the matter of increases in pay for the miners and freight rates were some of the matters discussed.

The operators began the presentation of their case on April 11, and it is believed that it will take several weeks before it is completed. It was expected by the public that the mine owners would make known at this time the reduction in pay they would demand that the mine workers take, but it was not forthcoming. Because of the plentiful supply of coal and the absence of excitement the public seems to have lost interest in the present negotiations.

Colorado Suffers Less and Less from Strike

COLORADO is suffering less and less by reason of the strike. The southern bituminous fields are producing more than they did before April 1, though the lignite fields in the north are producing less. The reopening during the past few days of one of the Victor-American Fuel Co.'s mines on an open-shop basis marks a weakening of the union's former grip. The Victor-American mine is the Delagua property. The company's other six mines, once operated on a union basis, also will be opened soon with non-union men, it is reported.

Following the Colorado Fuel & Iron Co. wage reduction last November, the Victor-American mines were idle for a few weeks until the miners requested that the operations be reopened at a reduced scale. The union agreed to a revision downward, so that the company could compete with the Colorado Fuel & Iron Co.

The latter company has set a new high record in the southern bituminous fields since the strike, with a daily production of more than 9,000 tons. Approximately 3,000 miners are at work in these mines, a gain of nearly 500 over the first day of the strike, and indicating close to 90 per cent of normal production. This company produces practically one-third of the coal mined in the state.

Frederick, Puritan and Columbine mines are operating in the Weld lignite district with about a 25 per cent force. Rangers have been drawn into the strike zone, but conditions are quiet. Laborers there apparently will accept the $5.45 a day offered instead of $7.90, the wage paid until recently, for there are more miners than jobs.

Administration Continues Hands-Off Policy, But Expects to Be Dragged Into Strike

BY PAUL WOOTON
Washington Correspondent of Coal Age

FLATNESS of the market and the number of non-union men who have joined the ranks of the strikers are the outstanding features of the second week of the strike. The strike had not progressed far into its second week when, in the judgment of newspaper editors, public interest did not justify the continued appearance of strike news on the first page of their papers.

That the action of so large a number of non-union men in joining the strike came as a complete surprise is demonstrated by the fact that the estimates of production made before the strike was called all counted on Pennsylvania's full non-union production. The action of the men in the southern portion of the Connellsville field is attributed to the infiltration of union workers. While they have been willing to work in the non-union mines, they have been otherwise loyal to labor organization principles. As a result they have been effective missionaries. Some are of the opinion that infiltration is a part of the strategy of the United Mine Workers.

While consumers responded wholeheartedly to the warning that stocks must be built up prior to the strike, there has been a tendency since April 1 to forget their responsibility. The union has not forced production down to 3,500,000 tons a week. It has been the buyers. Every rebuilding point is jammed with cars of unsold coal. There were 22,000 cars of unbilled coal awaiting consignment at the end of the week. Since there is every prospect of an extended strike, the advantages expected to come from the building up of stocks will be lost unless they are maintained. With production at its present level and with consumption exceeding production by 5,000,000 tons a week, the country's coal pile will disappear rapidly. Unless buying begins promptly, the mine workers' prediction that the country will be yelling for coal within a month is likely to be more nearly accurate than the forecasts of some of the other pencil prophets. The very fact that the strike story was crowded off the first page of the newspapers so promptly and the refusal of the public to get excited over the controversy is the more reason why it is likely to lose sight of the fact that its ability to withstand a siege is being lessened at a rapid rate with each passing day.

CONSIDER TRIBUNAL SIMILAR TO RAIL LABOR BOARD

The administration's policy continues to be an emphatic one of hands off. It is recognized that sooner or later, if the strike lasts, the Federal Government will be dragged into it. Thought already is being given to some sort of tribunal to which may be entrusted the task of handing down a decision by which both parties to the strike must abide. Since the experience of the railroad executives and the railroad brotherhoods there has been much less talk of the uselessness of the Railroad Labor Board. Resort may be had to a similarly constituted body to decide the coal issues. Some months ago when both the brotherhoods and the railroad executives were loud in their denunciation of the Railroad Labor Board, a conference between them was arranged after each had contended that the Labor Board is a fifth wheel on a wagon, and that they could settle all their differences between themselves. They met in direct negotiations under the most propitious circumstances. The situation was not acute and there was plenty of time to discuss the questions at issue, yet they failed absolutely to reach an agreement and have gone back to the Labor Board.

The public welfare is dependent upon coal to almost the same degree as it is on transportation. When the public begins to suffer material losses, some plan of settlement will be forced on operators and men alike. Before April 1 the operators were quite willing to submit the whole matter to arbitration, and the United Mine Workers consistently refused to consider such a course. There is nothing to indicate that either side has changed in this regard. The coal diggers argue that all arbitration is a compromise and that it is justice rather than a compromise that they are after. Incidentally, it may be stated, when they announced that view they were not willing to accept a suggestion that deliberate justice be meted out by a disinterested tribunal which would be set up for the purpose. Just at this time, however, both operators and miners are thinking seriously that this may be the best way to reach a settlement.

With the strike have come numerous suggestions for the cure of the ills in the coal industry—the industry, as one official puts it, that furnishes half-time employment and tries to pay double wages. One suggestion is for the consolidation of mines by districts so that the inefficient mines may be absorbed. The reaction to that in official circles is that such a plan would amount to nationalization. If district-wide consolidations were permitted, the public would demand government control. Just at this time the last thing the administration wants to do is to enter on any type of regulation or control of coal. The suggestion is put forward that perhaps a more workable plan would be the setting up of common selling agencies in each district. So far as seasonal freight rates on coal are concerned, it is safe to say that the administration is far from convinced that this plan would plane out many bumps. In fact the official opinion, in some quarters at least, seems to be that there is no seasonal element of great consequence in the coal industry. Officials are hopeful, however, that the industry itself can work out some plan of the sliding scale of wages based on a six-day week.

Since there is no sign of compromise between the anthracite operators and miners, the opinion is expressed in Washington that the anthracite strike is more likely to be long drawn out than is that in the bituminous industry. Anthracite stocks are the subject of considerable speculation because the producers have released no figures. There are rumors afloat placing anthracite stocks at almost unbelievably large figures.

No Outbreaks in Illinois

ILLINOIS went through the second week of the strike without notable disorder and without any move having been made by either operators or miners of that state that appeared to bring a settlement closer. The state was criss-crossed constantly by rumors, however. John L. Lewis, president of the United Mine Workers of America, during a visit at his home in Springfield late in the week took occasion to deny one. It was to the effect that the miners' policy committee had given him a certain length of time within which to procure government intervention. If he failed, the rumor had it, the committee would take complete charge of the situation for the miners.

Harry C. Adams, president of the Central Illinois Operators' Association, returned to Chicago from a trip through his field last week and reported that some of the engineers supposed to stay on duty at the pumps had quit and that company men had to be put on the jobs.

Members of Gillen Board Resign; Minister of Labor to Appoint New Body

THE Gillen board, reconvened by the Dominion Minister of Labor a few days ago, to conduct a further inquiry into the Nova Scotia coal mining troubles, has ceased to exist and in its place a new board of conciliation and investigation has been provided for by James Murdock, Minister of Labor, under the Industrial Disputes Investigation Act, to carry out the duties placed before the Gillen board when reconvened.

U. E. Gillen, of Toronto, chairman of the board, and James Ling, Mayor of Waterford, N. S., resigned from the reconvened board, and their resignations were accepted by Mr. Murdock, who then proceeded under the Industrial Disputes Investigation Act to provide another board to carry on the work.

The Minister of Labor stated that he would at once request both the employers and employees to recommend the name of a person competent to act as a member of the board of investigation.

House Bill Proposes Mine Operation Under Court Receivers as Strike Remedy

OPERATION of coal mines under court receivers during periods of suspension is proposed as a remedy for the existing strike situation by Representative Huddleston, of Alabama, in a bill introduced in the House April 12 and referred to the Interstate Commerce Committee.

The bill provides as follows:

> That whenever a mine used for the production of coal for interstate commerce shall suspend such production, the district court of the United States for the district in which said mine is situated, or the presiding judge thereof, if such court be not in session, shall, upon the petition of the Attorney General, appoint a receiver for the said mine and the equipment, appurtenances, plant and other property used in connection therewith.
>
> That subject to the direction of the court, the receiver so appointed shall operate the said mine and property for the production of coal until the release and restoration thereof to the possession of the person, firm or corporation entitled to such possession shall be directed by the Attorney General or until such person, firm or corporation so entitled to possession shall reasonably satisfy the court having jurisdiction of the proceeding that operation of said mine will be proceeded with if so released and restored.

The bill also prescribes new rules for car distribution to coal mines. It proposes that the Interstate Commerce Commission shall allocate and apportion to each mine or to each operator of a group of mines "a just proportion of cars suitable for transporting coal."

> Such allocation shall be made annually as nearly as may be and shall be based upon findings as to capacity of mines, quality of product, demand and market therefor, prices at which coal is sold, and such other factors as may relate to the public welfare. Upon such allocation being made it shall be the duty of the railroad to supply cars as provided by the allocation, and for failure to do so shall be liable to a fine of not less than $25 nor more than $100 for each car as to which it may be in default for each day of such default.

Hazard Field Merger Still in Embryo

THE proposed merger of every coal mining operation in the Hazard field of Kentucky did not progress far enough during the negotiations of the past week to justify any announcement by those interested. It was stated, however, that the consolidation plan has not fallen, and that the merger is "more than merely possible," but that it cannot be effected for several months at the earliest. If it is effected, it may consolidate merely the dozen independent operations of that field or it may envelop the entire field, including the Blue Diamond Coal Co. and the Southern Coal & Coke Co. If only the limited plan is worked out, a huge corporation will be the result, with a capitalization close to $25,000,000. In either case, it is said, great economies could be made in mine management and in selling.

Mr. Daugherty Uses Words

AFTER his conference, on April 10 and 11, with Judge Anderson, L. Ert Slack and others, at Indianapolis, Attorney General Daugherty, referring to a prospective wage conference, said the government had not opposed a conference, but had presumed one would have been held before April 1, "for the parties to agree upon a legitimate program." After asserting that the government could not force a conference, his statement added:

"Whether a meeting is held or not, the government will maintain successfully, by any proceeding that may be necessary, that agreements heretofore reached between the operators and miners, year after year for many years, which are a violation of the law and for which indictments have been found, shall not be repeated. Repetition of these things will be to the disadvantage of the government's policy because they are a violation of the law and work a hardship upon the consuming public. No 'horseplay' or pretended misconception on the part of anybody will change the government's position in this regard.

"As to the indictments pending in this court for violations of the law on the part of many of these parties heretofore, I have only this to say: That certain things charged in the indictments were violations of the law, and the government will not, by trade or compromise, consent to them being done again. If many of the things done at these meetings time and time again are not repeated, miners will get a fair return for their labor, operators will get a fair return on their investments and the consumer will get the product he is entitled to at a fair price.

"The country is tired of compromises, especially when the compromise is so expensive to the country and the consuming public. We are in favor of a settlement of these propositions on fair lines and in a positive way, in order that the government will not be compelled to interfere with business. For many years, as the time expired for these so-called meetings, the country was the innocent victim of these bi-annual meetings and pretended virtuous adjustments. The government recognizes that stability is necessary, and is willing to protect each of these parties in the performance of legitimate and lawful pursuits on the one hand, and to prevent their doing an unlawful and improper thing, to the detriment of the government and all of the country, on the other hand."

Bland Prepares New Bill for Fact Finding In Coal Production and Distribution

A BILL creating a federal fact-finding agency to gather all possible data on the production and distribution of coal is being prepared by Representative Bland, of Indiana, for presentation to the House Labor Committee, for consideration in lieu of his former bill proposing that the President appoint a commission to investigate wages and other conditions in the industry. Mr. Bland takes the position that before legislating on the coal situation Congress must have in its possession all possible facts on the subject, and that these should be obtained by a federal agency.

He expects to lay the bill before the committee this week and will urge its favorable report to the House with a view of obtaining early enactment. The bill will differ from other bills of a like character in that it will not provide for activity in fact finding by the Federal Trade Commission. Mr. Bland proposes that the fact finding body shall be made up of representatives of the Bureau of Mines, the Geological Survey, the Bureau of Labor Statistics and the Census Bureau.

Pennsylvania Supreme Court Hears Appeals On Anthracite Tax and Mine-Cave Law

BY a special order the Pennsylvania Supreme Court on Monday, April 17, heard arguments on the constitutionality of the anthracite tonnage tax act passed at the last session of the state Legislature and declared valid by a recent decision of the Dauphin County courts.

Attorney General George E. Alter handled the argument for the commonwealth with Attorney Henry S. Drinker, Jr., of Philadelphia, for the coal companies. Attorney Reese H. Harris, of Scranton, and former Judge F. W. Wheaton, of Wilkes-Barre, also argued for the coal companies.

The case came before the Dauphin County Court through a bill in equity filed by Roland C. Heisler against the Thomas Colliery Co., its officers, the Attorney General and the State Treasurer to restrain the defendants from imposing an ad valorem tax of 1½ per cent on the value of anthracite coal produced. Mr. Heisler is a stockholder in the Thomas Colliery Co. The Dauphin County Court dismissed the bill and held the act constitutional, whereupon Mr. Heisler appealed.

This will mark the second time for the Supreme Court to pass on the constitutionality of an anthracite tonnage act. In 1913 a similar bill, known as the Roney act, was passed. This was declared constitutional by the Dauphin County Court, which decision was later upset by the Supreme Court. This act levied an ad valorem tax of 2½ per cent on all anthracite coal produced.

Also scheduled for argument was the constitutionality of the Kohler mine-cave law, the same attorneys representing the Pennsylvania Coal Co. in this case.

Three More Mines Build Top Works

ACTIVITY in equipping and improving mine properties, a program now noticeable in several mining fields, is making itself felt in Indiana and Kentucky. Three construction jobs involving expenditures of almost $100,000 were reported recently. All of them are now under way and should be completed within sixty days.

The building of a new steel tipple at the Standard Coal Co.'s mine at Wheatland, Ind., on the Baltimore & Ohio R. R., together with the installation of an entire new preparation plant involves a novel and interesting scheme. It was necessary to put in better screening and loading apparatus. But the shaft is too close to the loading tracks to permit of the usual placing of the new plant. Therefore Allen & Garcia devised a system of back dumping into the weighpan. The coal goes from there over a special docking table and steel apron conveyor circling around to the front of the shaft, over picking tables and screens to a loading boom of the latest type. There is said to be no other plant in the country like this one. It will cost something over $60,000.

The Stearns Coal & Lumber Co. is installing machinery at both its White Oak and Fidelity mines at Stearns, Ky. The White Oak operation has been producing nothing but mine-run coal since it started over two years ago. It is now being equipped with shaker screens for making four sizes and with loading booms for properly placing the coal in cars. This installation will cost the neighborhood of $12,000.

At the Fidelity mine two slopes extend into hills on opposite sides of a hollow. The tipple for both stands beside the railroad midway between. The south mine has been producing for some time. A belt conveyor on a bridge carries the coal down to the tipple. The north side is just ready to begin production. A retarding conveyor for mine-run coal is now being installed and will soon be ready to deliver the mine's output to the screens at the tipple. The investment in this conveyor installation is approximately $14,000.

Navy Authorities Estimate Year's Coal Needs at 376,906 Tons

ESTIMATES of coal requirements for the navy for the coming year's operations are based on 440 vessels being in commission, cruising an average of 16,200 miles for the year. The fuel estimates were explained to the Senate Appropriations Committee by naval officers in charge of fuel purchases and operation of ships, and were subjected to close questioning, due to the recent conflict of the committee with the navy in its effort to reduce fuel expenses.

The navy authorities said they contemplate purchasing 376,906 tons of coal at $8.84 a ton, or a total of $3,335,241. It is contemplated to use 60,000 tons of coal in vessels on the Pacific coast from stock already on hand while 110,000 tons will be sent to Pacific coast points by commercial vessels. The navy has a two-year supply of coal on the Pacific and Atlantic coasts, of which 43,000 tons are at San Diego, 107,000 tons at Tiburon and 30,000 tons at Puget Sound. It is estimated that 140,000 tons of coal will be used on the Pacific next year, of which 45,000 tons will be taken from stock, which will be replaced by sending an additional 95,778 tons for current needs and to maintain storage reserves.

Freight Car Loadings Recede 19,024 Week Of April 1, Due to Drop in Coal Movement

FREIGHT-CAR loadings during the week ended April 1 totaled 827,011, compared with 846,035 during the previous week, or a decrease of 19,024 cars. This was, however, 163,840 cars in excess of the total for the corresponding week last year but 31,816 below that for the corresponding week in 1920. The reduction compared with the week before was due principally to a falling off in coal shipments resulting in part from the strike of coal miners which became effective on April 1. Coal loadings totaled 184,952 cars, 19,634 under the preceding week.

Secretary Hoover Restates His Position on Open Price Associations

WHERE the Secretary of Commerce stands on open price associations is forcibly set forth in a statement and letter from Mr. Hoover on April 13 in reply to certain published criticism by Samuel Untermyer, of New York. Mr. Untermyer, it will be remembered, has spent the last two years as counsel for the Lockwood Committee of the New York State Legislature, digging out combinations in restraint of trade in the building industry, and recently took exception to the support Secretary Hoover is giving to the trade-association movement.

Mr. Hoover's comment on Mr. Untermyer's criticism was as follows:

"Mr. Untermyer's statement apparently arises from his oversight of the word 'not' in various statements of this department on its economic views and relations to trade associations. Far from extolling so-called 'open price associations' the department has consistently stated that it cannot and does not approve of them on economic grounds. Whether legal or illegal they constitute less than 10 per cent of the trade associations of the country. It is the function of this department to deal with the 90 per cent of constructive elements in American commerce and industry, while it is Mr. Untermyer's business to deal with the minority of destructive elements. My reply to Mr. Untermyer's letter was as follows [under date of April 11]:

REVEALS CONTENTS OF REPLY TO UNTERMYER

"'I am in receipt of your letter of April 8, in which you suggest that I desist from co-operative work between this department and trade associations. I also notice you state:

"'"There are, of course, a great number of legitimate trade associations throughout the country, of which the Illinois Manufacturers' Association is an illustration, that are performing invaluable services to the business world. They should be assisted in every possible way in enlarging their usefulness, but the associations of that character require no instructions as to what they may or may not lawfully do. I am very familiar with the activities of the trade organizations of this class and know of none of them that have drifted into the twilight zone between legality and illegality."

"'If you will read my various public statements referring to this department's work you will find that they are in agreement with the above paragraph, and that this very type of associations co-operate with this department in many matters such as foreign trade, transportation, employment, simplification of methods, improvement of processes and a dozen other subjects of public welfare.

"'As this department is advised by the Department of Justice and its own eminent counsel, I believe it is in position to know the difference between legitimate trade associations and those associations which are cloaks for violation of the law.

"'Upon my return from the West my attention was called to various communications from yourself in the press in which you persistently reiterate that I have "in public speeches, newspaper interviews and articles, been championing and insisting upon the legality of so-called open price associations." All this sounds strange to me, for ever since I undertook this office, and in exactly the above manner, I have repeatedly stated that legal or illegal (and the legality has not been determined) I did not consider open price associations to be in public interest. Indeed, such a statement was made by me on the occasion of the statement to which you addressed your remarks and must have been overlooked by you. I trust you will correct the misimpression you thus convey.

"'I note your suggestion that at the forthcoming conference of trade associations here, consideration should be given to a bill which you have laid before the State Legislature at Albany. I therefore assume that you believe such a conference will be of purpose if it considers this legislation. I shall take great pleasure in bringing it to your attention, although the department could not properly advance opinions upon state legislation.'"

Production and the Market

Weekly Review

THE striking feature of the bituminous coal market at the beginning of the third week of the suspension is the lack of interest of buyers in all but very local markets. The only activity that might ordinarily be expected to attend the closing down of the majority of coal mines of this country is found on the Atlantic seaboard from Baltimore to New York and in the steel producing section from Buffalo to Cleveland.

The unexpected success of the union in cutting off non-union production in central Pennsylvania is the immediate cause of what little flurry there is in the market. Steel producers ordinarily dependent on Connellsville coal have been active the last week in buying high-volatile tonnage in eastern Kentucky and in bidding for what central Pennsylvania high-volatile coal is available.

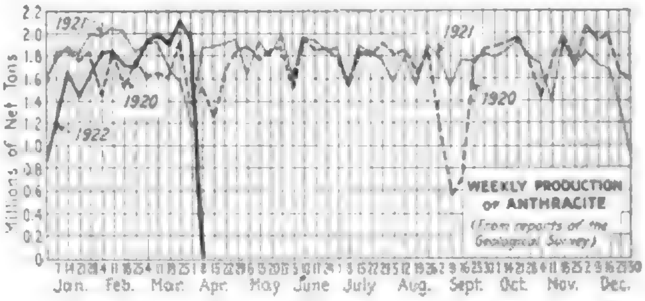
DEMAND LIMITED; LITTLE COAL CHANGES HANDS

A number of important interests in New York and Philadelphia markets that had expected to have ample non-union tonnage have bought up the available free coal on track east of Altoona and Cumberland and have begun to move southern West Virginia coal in increasing quantities by boat from Hampton Roads to both New York and Philadelphia. Despite the fact that prices have stiffened in New York and "coal is coal," the actual demand is limited and comparatively little tonnage is changing hands. The price on Pennsylvania coal is now around \$3 with off-grades quoted as low as \$2.75 and some of the better grades as high as \$3.75 as an exceptional figure.

Coal Age Index of spot prices of bituminous coal on April 17 was 184, a gain of three points in one week. Prices are now where they were in the third week of January, 1922, since when they receded to the low point immediately prior to the strike.

The reverse of the picture is found in the Chicago market and in the Northwest. "No-bills" are still heavy in southern Illinois and there is yet no scarcity of Eastern coals. This condition extends as far West as the Rocky Mountains.

Anthracite, except pea and buckwheat No. 1, is practically off the market. There is certainly no abundance of any other sizes save these, prices for which are steady at the company circular that has been maintained for several months.



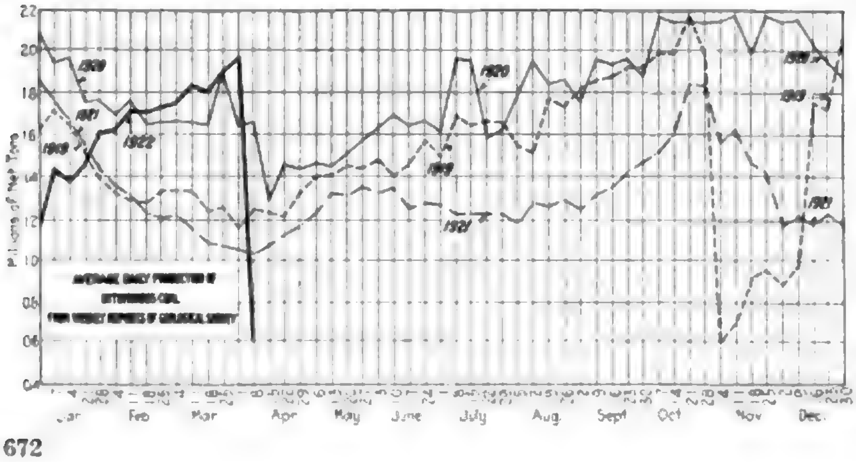
With the curtailment of beehive coke production in the Connellsville region there has been an increased demand for coal for byproduct coke plants. Beehive coke is practically off the market, and until production makes headway the iron industry will have to depend on byproduct coke for which there is ample capacity providing coal can be obtained.

BITUMINOUS

The Geological Survey raised its estimate of the production of bituminous coal from 3,500,000 to 3,784,000 net tons for the first week of the strike which was higher than that in the opening week of the 1919 strike. With reference to the second week of the strike the survey says:

"Preliminary telegraphic returns for last week (April 10-15) indicate no change in anthracite, but a slight decrease in the output of bituminous coal.

"The current production is less than the districts now at work are able to produce when the demand for coal is



Estimates of Production

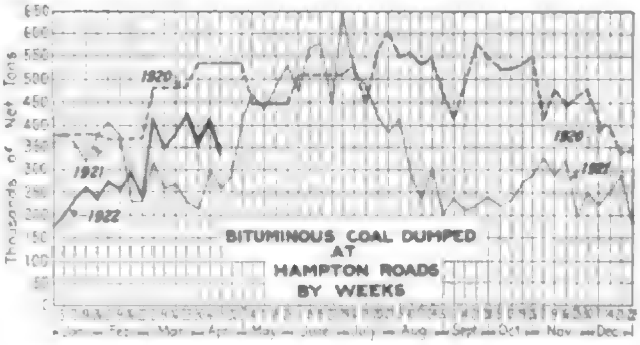
(Net Tons)

BITUMINOUS Week ended:	1922	1921
Mar. 25 (*b*)	11,448,000	6,457,000
Apr 1 (*b*)	10,463,000	5,822,000
Apr 8 (*a*)	3,784,000	6,120,000
Daily average	631,000	1,020,000
Calendar year	133,066,000	106,824,000
Daily av. cal. year	1,613,000	1,295,000
ANTHRACITE		
Apr 1	1,896,000	1,564,000
Apr. 8 (*a*)	9,000	1,865,000
Calendar year	21,786,000	24,382,000
COKE		
Apr. 1	191,000	81,000
Apr. 8 (*a*)	170,000	78,000
Calendar year	1,978,000	2,627,000

(*a*) Subject to revision. (*b*) Revised from last report active. It is true that a number of important non-union mines in the Connellsville coke region and in Central Pennsylvania have been closed by the strike but the existing demand is not sufficient to call out full production in those districts remaining at work. From mines in many non-union fields reports of "No market," "Dull demand," and "Unbilled coal," continue to be received. The number of loaded cars unconsigned at the mines was very large when the strike began, but the latest reports from the railroads show that it is increasing rather than decreasing."

Demand is spotted, being lively in the regions where non-union curtailment is heavier. The North Atlantic market centers show the effect of reduced receipts. The rising market here is due to the buying activity of shippers who must fill commitments predicated on non-union operations which are now shut off. The resultant scarcity of tonnage on the North Atlantic seaboard has caused a sharp price increase and has increased the flow of coal by water from Hampton Roads. Demand is coming from those who had not protected their requirements with ample stocks.

New England, Northwest and Midwest markets are still saturated with tonnage. Coal at Hampton Roads is quotably higher because of a scarcity but New England demand has diminished and delivered prices are still low because of the softened coastwise freights. Southern Illinois mines still have many "no-bills" on track, mostly domestic, and only for screenings is there any interest shown. The Midwest is so full of coal that there has been no flareback of the Eastern market stimulation as yet. In Cleveland there has been a strong price flurry, caused by heavy orders from steel makers who are in the unenviable position of being caught with inadequate fuel supplies just at the time their own business was on the mend. At the Head-of-the-Lakes buyers are complacently eying the 3,000,000-ton dock carry-over. The news of early receipts of 30 coal-laden vessels to augment dock supplies is deterring consumers from increasing their orders over current requirements.



Lake dumpings for the season are approximately 8,000

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Mar. 20, 1922	Apr. 3, 1922	Apr. 10, 1922	Apr. 17, 1922†
Pocahontas lump	Columbus	$3 05	$2 95	$2 85	$2 65@ $2 90
Pocahontas mine run	Columbus	1 85	1 85	2 15	*1 85@ 2 00*
Pocahontas screenings	Columbus	1 15	1 15	1 35	**1 30@ 1 50**
Pocahontas lump	Chicago	3 15	2 60	2 40	**2 25@ 2 75**
Pocahontas mine run	Chicago	1 85	1 35	1 75**	*1 60@ 1 75*
Pocahontas lump	Cincinnati	2 85	2 90	2 50	*2 25@ 2 50*
Pocahontas mine run	Cincinnati	1 70	1 75	1 90	*1 65@ 1 75*
Pocahontas screenings	Cincinnati	1 15	1 25	1 65	*1 60*
*Smokeless mine run	Boston	4 55	4 55	4 60	**4 70@ 4 80**
Clearfield mine run	Boston	1 95	1 95	2 05	**1 90@ 2 40**
Cambria mine run	Boston	2 45	2 45	2 30	**2 15@ 2 90**
Somerset mine run	Boston	1 90	1 90	2 10	**2 00@ 2 50**
Pool 1 (Navy Standard)	New York	2 85	2 85	2 80	**3 00@ 3 75**
Pool 1 (Navy Standard)	Philadelphia	3 00	2 80	2 80	**3 00@ 3 25**
Pool 1 (Navy Standard)	Baltimore	2 65	2 70	2 70	
Pool 9 (Super. Low Vol.)	New York	2 30	2 25	2 40	**3 00@ 3 50**
Pool 9 (Super. Low Vol.)	Philadelphia	2 35	2 15	2 30	**2 50@ 3 00**
Pool 9 (Super. Low Vol.)	Baltimore	2 15	2 30	2 50	
Pool 10 (H. Gr. Low Vol.)	New York	1 90	2 00	1 95	**2 50@ 3 00**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2 10	1 90	2 00	
Pool 10 (H. Gr. Low Vol.)	Baltimore	2 10	2 20	2 25	
Pool 11 (Low Vol.)	New York	1 70	1 80	1 75	**2 50@ 3 00**
Pool 11 (Low Vol.)	Philadelphia	1 75	1 75	1 75	**2 00@ 2 50**
Pool 11 (Low Vol)	Baltimore	2 05	2 10	2 15	**2 50@ 3 00**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1 50	1 60	1 70	**2 75@ 3 00**
Pool 54-64 (Gas and St.)	Philadelphia	1 50	1 50	1 55	**2 00@ 2 25**
Pool 54-64 (Gas and St.)	Baltimore	1 55	1 60	1 70	**2 75@ 3 00**
Pittsburgh sc'd. Gas	Pittsburgh	2 65	2 65		
Pittsburgh mine run (St.)	Pittsburgh	2 00	1 85		
Pittsburgh slack (Gas)	Pittsburgh	1 55	1 55		
Kanawha lump	Columbus	2 30	2 35	2 35	*2 25@ 2 40*
Kanawha mine run	Columbus	1 50	1 45	1 55	**1 45@ 2 70**
Kanawha screenings	Columbus	1 45	1 35	1 45	**1 40@ 1 60**
W. Va. Splint lump	Cincinnati	2 15	2 15	2 00	1 75@ 2 25
W. Va. Gas lump	Cincinnati	1 85	2 10	1 75	1 75
W. Va. mine run	Cincinnati	1 40	1 45	1 55	**1 75@ 2 00**
W. Va. screenings	Cincinnati	1 30	1 30	1 40	**1 60@ 1 75**
Hocking lump	Columbus	2 60	2 55		**2 50@ 2 75**
Hocking mine run	Columbus	1 75	1.75		1 65@ 1 90
Hocking screenings	Columbus	$1.55	$1 55		$1 40@ $1 65
Pitts. No. 8 lump	Cleveland	2.90	2 75	$2.60	**3 00@ 3 75**
Pitts. No. 8 mine run	Cleveland	1.90	1 80	1.80	**2 25@ 2 45**
Pitts. No. 8 screenings	Cleveland	1.70	1.65	1.85	**2 00@ 2 40**
Midwest					
Franklin, Ill. lump	Chicago	3 40	3.35	3.45	*3 00@ 3.65*
Franklin, Ill. mine run	Chicago	2 50	2.40	2 75	2.50@ 3 00
Franklin, Ill., screenings	Chicago	1 95	2 05	2 65	**2.50@ 3 00**
Central, Ill., lump	Chicago	2.80	2 60	2 60	
Central, Ill. mine run	Chicago	2 35	2 25	2 60	
Central, Ill., screenings	Chicago	1 75	1.85	1 85	
Ind. 4th Vein lump	Chicago	3 15	3.15	3 15	3 00@ 3.25
Ind. 4th Vein mine run	Chicago	2.45	2.35	2.45	**2 25@ 2 75**
Ind. 4th Vein screenings	Chicago	2 00	2.15	2 00	**2 00@ 2 50**
Ind. 5th Vein lump	Chicago	2.80	2 60	2 60	2.50@ 2 75
Ind. 5th Vein mine run	Chicago	2.20	2 20	2 60	2 50@ 2 75
Ind. 5th Vein screenings	Chicago	1.60	1 75	2 20	**2 25@ 2 50**
Standard lump	St. Louis	2.55	2 65	2 65	
Standard mine run	St. Louis	1 80	1 80	1 90	
Standard screenings	St. Louis	1 10	1 45	1.70	
West. Ky. lump	Louisville	2.35	2 35	2 45	*2.25@ 2.60*
West. Ky. mine run	Louisville	1.75	1 85	1.90	**1 75@ 2 25**
West. Ky. screenings	Louisville	1.45	1 70	1.90	1 75@ 2.10
South and Southwest					
Big Seam lump	Birmingham	2.60	2 00	2 00	2 00
Big Seam mine run	Birmingham	1.85	1.70	1 70	1 50@ 1.90
Big Seam (washed)	Birmingham	1.85	1.85	1 85	1 75@ 2.00
S. E. Ky. lump	Louisville	2 10	2 25	2 25	**2 25**
S. E. Ky. mine run	Louisville	1 60	1 55	1 70	**1 75**
S. E. Ky. screenings	Louisville	1 30	1.40	1 50	**1 50@ 1 60**
S. E. Ky. lump	Cincinnati	2 10	2.10	1 90	**2 00@ 2 25**
S. E. Ky. mine run	Cincinnati	1 45	1.40	1 60	**1 75@ 2 00**
S. E. Ky. screenings	Cincinnati	1 25	1.30	1 45	**1 50@ 1 75**
Kansas lump	Kansas City	5.00	4 50	4.25	4.00@ 4 50
Kansas mine run	Kansas City	4.00	4 00	4 00	4 00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

**Note correction from last week.

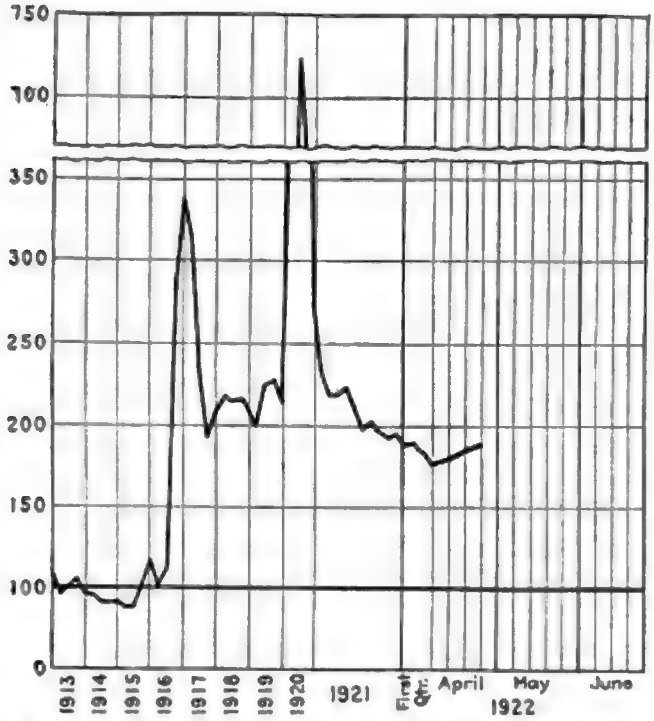
*Gross tons, f.o.b. vessel, Hampton Roads.

†Advances over previous week shown in heavy type, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

	Market Quoted	Freight Rates	April 3, 1922		April 10, 1922		April 17, 1922†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	$2.61		$7.60@ $7.75		$7.60@ $7.75		$7.60@ $7.75
Broken	Philadelphia	2.66	$7.00@ $7.50	7.75@ 7.85		7.75@ 7.85		7.75@ 7.85
Egg	New York	2.61	7.60@ 7.75	7.60@ 7.75	$7.75@ $8.00	7.60@ 7.75	$7.75@ $8.00	7.60@ 7.75
Egg	Philadelphia	2.66	7.25@ 7.75	7.75		7.75		7.75
Egg	Chicago	5.63	*7.50	*6.95@ 7.40		*6.95@ 7.40		
Stove	New York	2.61	7.90@ 8.20	7.90@ 8.10	8.10@ 8.50	7.90@ 8.10	*8.10@ 8.25*	7.90@ 8.10
Stove	Philadelphia	2.66	7.85@ 8.15	8.05@ 8.25		8.05@ 8.25		8.05@ 8.25
Stove	Chicago	5.63	*7.75	*7.20@ 7.60		*7.20@ 7.60		
Chestnut	New York	2.61	7.90@ 8.20	7.90@ 8.10	8.10@ 8.50	7.90@ 8.10	*8.10@ 8.25*	7.90@ 8.10
Chestnut	Philadelphia	2.66	7.85@ 8.15	8.05@ 8.25		8.05@ 8.25		8.05@ 8.25
Chestnut	Chicago	5.63	*7.75	*7.20@ 7.60		*7.20@ 7.60		
Pea	New York	2.47	5.00@ 5.75	5.75@ 6.45	5.25@ 6.00	6.00@ 6.45	*5.25@ 5.75*	6.00@ 6.45
Pea	Philadelphia	2.38	5.50@ 6.00	6.15@ 6.25		6.15@ 6.25		6.15@ 6.25
Pea	Chicago	5.63	*6.10	*5.60@ 6.10		*5.60@ 6.10		
Buckwheat No. 1	New York	2.47	2.75@ 3.50	3.50	3.00@ 3.50	3.50	3.00@ 3.50	3.50
Buckwheat No. 1	Philadelphia	2.38	2.75@ 3.25	3.50		3.50		3.50
Rice	New York	2.47	2.00@ 2.50	2.50	2.00@ 2.50	2.50	2.00@ 2.50	2.50
Rice	Philadelphia	2.38	2.00@ 2.50	2.50		2.50		2.50
Barley	New York	2.47	1.50@ 1.85	1.50	1.50@ 1.85	1.50	1.50@ 1.85	1.50
Barley	Philadelphia	2.38	1.50@ 1.75	1.50		1.50		1.50
Birdseye	New York	2.47		2.00@ 2.50		2.00@ 2.50		2.00@ 2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index 184, Week of April 17, 1922. Average spot price for same period, $2.23. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh, Central Illinois, Mt. Olive and Standard prices not included in figures for last week.)

cars, as compared with 9,700 last year. The season had lagged farther behind the 1921 program until recently when the poor line demand diverted more coal to the lower ports. Vessels have been lined up to take 100,000 tons from Lake Erie ports to Buffalo, if the coal scarcity in that section grows more serious.

Hampton Roads dumpings for all accounts slumped to 342,788 net tons in the week ended April 13 as compared with 411,252 tons in the previous week. Pier tonnage is growing, however, showing that an important factor in the decreased dumpings is the lack of a ready market.

ANTHRACITE

Production of hard coal came to an abrupt stop on April 1. The strike closed every mining operation and only 9,000 net tons were loaded—172 cars, of which 27 were hold-overs and 145 filled by river dredges. Retail distribution has been very moderate so far this month and yard stocks are said to be ample for all demands that will be made during the balance of the present coal-burning season.

Producers have shipped practically all their domestic mine storage, with the exception of pea, which is moving out better. The situation is affording an opportunity for the companies to sell their heavy tonnage of pea coal which has been long all season. In the steam sizes at the mines, buckwheat is moving well but the other coals are becoming scarce.

COKE

Production of beehive coke was affected by the non-union walk-outs in the Connellsville region. The output during the week ended April 8 was 170,000 net tons, a decline of 11 per cent from the preceding week. Production in the Lower Connellsville region is greatly curtailed but an increase in the upper basin tends to offset the decline. There is no regular market, as coke buyers refuse to pay the high asking prices which have prevailed since tonnage became scarce. Where coke is needed in an emergency, furnace is going at $5.50.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to April 1, 1922 Inclusive	Week Ended Apr. 1
U. S. total	45.6	55.7	58.0
Non-union			
Alabama	63.5	64.6	73.8
Somerset County	55.5	74.9	70.1
Panhandle, W. Va.	55.3	51.3	58.7
Westmoreland	54.9	58.8	73.3
Virginia	54.8	59.9	70.5
Harlan	53.3	54.8	56.5
Hazard	51.7	58.4	45.4
Pocahontas	49.8	60.0	61.5
Tug River	48.1	63.7	68.8
Logan	47.6	61.1	63.5
Cumberland-Piedmont	46.6	50.6	52.2
Winding Gulf	45.7	64.3	67.2
Kenova-Thacker	38.2	54.3	57.6
N. E. Kentucky	32.9	47.7	59.1
New River‡	24.3	37.9	30.3
Union			
Oklahoma	63.9	59.6	54.6
Iowa	57.4	78.4	75.4
Ohio, north and central	52.6	46.6	48.5
Missouri	50.7	66.8	63.3
Illinois	44.8	54.5	56.1
Kansas	42.0	54.9	49.4
Indiana	41.4	53.8	57.0
Pittsburgh†	41.2	39.8	46.1
Central Pennsylvania	39.1	50.2	52.1
Fairmont	35.3	44.0	10.4
Western Kentucky	32.5	37.7	43.2
Pittsburgh*	30.4	31.9	34.6
Kanawha	26.0	13.0	9.5
Ohio, southern	22.9	24.3	22.0

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES (a)

(Net Tons)

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,638,000	3,733,000
1920 Monthly average	2,565,000	1,748,000	4,313,000
1921 Monthly average	1,660,000	463,000	2,123,000
January, 1922	1,879,000b	496,000	2,375,000
February, 1922	1,795,000	549,000	2,344,000
March, 1922	2,137,000	732,000	2,869,000

(a) Excludes screenings and breeze. (b) Revised from last report.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE

(Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly average	2,625,000	4,354,000	6,979,000
1918 Monthly average	3,072,000	4,014,000	7,086,000
1919 Monthly average	2,988,000	2,478,000	5,466,000
1920 Monthly average	3,684,000	2,665,000	6,349,000
1921 Monthly average	2,385,000 a	731,000 a	3,116,000
January, 1922	2,699,000 a b	782,000 a	3,481,000
February, 1922	2,579,000 a	866,000 a	3,445,000
March, 1922	3,071,000 a	1,155,000 a	4,226,000

(a) Assuming a yield in merchantable coke 69.6 per cent of the coal charged in byproduct ovens, and 63.4 per cent in beehive ovens. (b) Revised from last report.

Winding Gulf Mine Workers Earn Adequate Living Under Reduced Wage Scale

EVEN under a lower wage scale, such as that which prevails in the Winding Gulf region of West Virginia, miners appear to be making a comfortable living, as shown in the earnings of miners at the Glen White plant of the E. E. White Coal Co. during the first two weeks of March. In that period earnings for the various classes of mine workers averaged as follows:

AVERAGE EARNINGS OF ALL LABOR AT GLEN WHITE MINE, FIRST HALF OF MARCH, 1922

INSIDE LABOR		OUTSIDE LABOR	
Machine cutting—contract	$158.00	Hoisting engineer	$80.00
Motormen	78.39	Tipplemen	53.90
Brakemen	58.42	Slate pickers	45.50
Bratticemen	69.30	Car loaders	60.63
Trackmen	70.20	Blacksmith	75.00
Timbermen	58.50	Car repairmen	71.30
Slatemen	55.44	Carpenters	64.40
Pumpmen	78.19	Ashmen	64.00
Wiremen	80.73	Firemen	74.80
Cagers	64.40	Plant repairmen	75.00

Working 192 days in 1921, 242 miners at Glen White had an average yearly income of $1,997.95 and 247 Stotesbury miners working 200 days had an average yearly income of $1,871.84.

Foreign Market And Export News

Lack of Adequate Dock Facilities Hampers British Export Trade

While demands for Admiralty and Monmouthshire classes of large remain strong, other descriptions of Welsh coals have lately shown irregularity. This is partly due to the engineering and other troubles having limited the Inland call, especially for manufacturing descriptions, which has thrown this on the export market in heavier quantities. The lack of adequate shipment facilities at the docks, because of the limited working hours, is a bar to the expansion of exports, and for this reason pits are being closed in districts producing an excess of the classes not directly in demand. For this reason there is a wide difference in the conditions prevailing in various areas.

Inquiries continue to circulate for supplies of coal for shipment to Canada and elsewhere, in view of the strike in the United States and Nova Scotia. Most of these, however, are of a tentative character. Ability to export much increased quantities, through congested docks, is lacking, and must remain an important factor. Some bunker orders have been placed, but reliable information is difficult to obtain. While big shipments are being made to India, South America, the Italian and French markets appear to have relaxed again.

Coal Paragraphs from Foreign Lands

INDIA—The bunker coal market at Bombay is firm and the fuel oil market steady.

GERMANY—Production of coal in the Ruhr region during the week ended April 1 was 1,930,000 metric tons, according to a cable to *Coal Age*. The previous week's output was 1,975,000 tons.

ITALY—The price of Cardiff steam first is quoted at 40s. 9d., according to a cable to *Coal Age*, unchanged from the previous week. No American coal is quoted on the Genoa market.

HOLLAND—The latest quotation on the Rotterdam coal market for British coal per gross ton is 13.50 gulden and 23s., c.i.f.

BELGIUM—The coal industry is becoming nervous. The demand remains apathetic owing to the increasing scarcity of orders and the uncertainty as to reductions in wages. The workers consider that owners should bear a part of the burden by reducing their profits. Meanwhile the weakness of industrial coals persists, while domestic descriptions, owing to the bad weather, are rather more active.

SPAIN—There is very little business in Asturian coals at Barcelona owing to the prices being almost on a par with those for British coal. The quotations are: Large, 82 pesetas and small, 60@65 pesetas.

The payment of the bounty of five pesetas per ton on Spanish coal leaving Spanish ports for coastal trading is to be prolonged for another three months.

VENEZUELA—The bunkering trade in the West Indies is beginning to feel the effect of the coal mine development at Guanta. These mines were opened in 1907 and apparently are being successfully developed. While the coal is highly volatile, it has been used successfully on the Royal Dutch Mail boats and is regarded as a fairly good coal.

Export Clearances, Week Ended April 13, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Dan. S.S. Niels R. Finsen, for Fort de France	2,758
For Brazil:	
Nor. S.S. Talabat, for Rio de Janeiro	9,993
For Chile:	
Nor. S.S. Johanne Sybwad for Punta Arenas	2,182
For Cuba:	
Nor. S.S. Marshall, for Havana	2,972
Am. S.S. Montoso, for San Juan	2,612
For Mexico:	
Br. S.S. Avon Queen, for Vera Cruz	1,029

FROM PHILADELPHIA

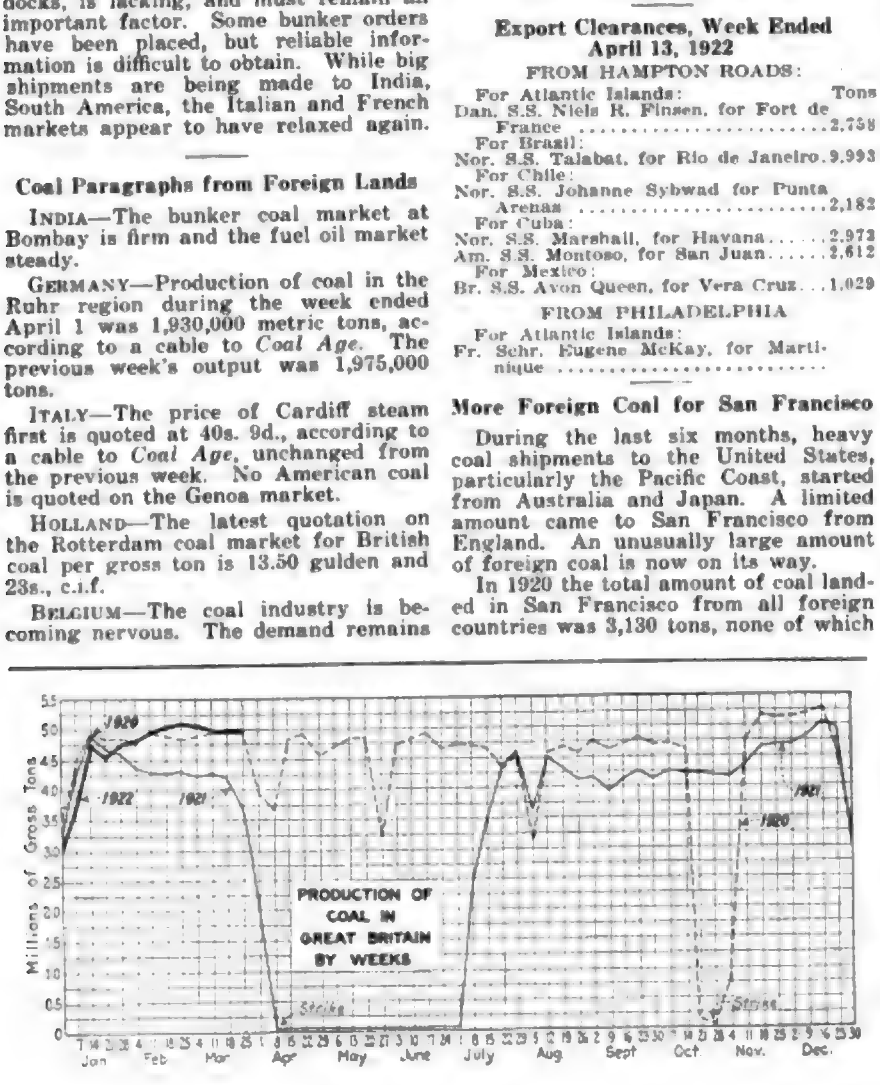
For Atlantic Islands:	
Fr. Schr. Eugene McKay, for Martinique	

More Foreign Coal for San Francisco

During the last six months, heavy coal shipments to the United States, particularly the Pacific Coast, started from Australia and Japan. A limited amount came to San Francisco from England. An unusually large amount of foreign coal is now on its way.

In 1920 the total amount of coal landed in San Francisco from all foreign countries was 3,130 tons, none of which was from Japan. In the last three months of 1921 there were 26,750 tons of Japanese coal, 20,405 tons of English coal and 27,420 tons of Australian coal landed in San Francisco.

At present there are four coal-laden steamers, three from Australia and one from England, due in San Francisco.



Better Demand at Hampton Roads

Cessation of mining at certain non-union operations greatly affected the dumpings at the piers during the week ended April 13. Then too, non-union tonnage is in better call throughout the country which also tended to reduce business here. Dumpings were 342,788 net tons as compared with 411,252 in the week preceding.

Prices show a little more stimulation, the largest increase being on pools, 5, 6 and 7 which are now quoted $4.65@$4.80, f.o.b. piers. Pool 1 is quoted up to $4.80. Coastwise movement is diminishing but this lack of demand is more than offset by a decrease in the supply, while softening marine freights to New England are keeping delivered prices on an even keel.

Hampton Roads Pier Situation

	Week Ended	
	April 6	April 13
N. & W. Piers, Lamberts Point:		
Cars on hand	1,849	2,156
Tons on hand	99,448	113,665
Tons dumped	152,501	171,267
Tonnage waiting	25,000	24,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,397	1,370
Tons on hand	69,850	77,850
Tons dumped	120,571	86,367
Tonnage waiting	12,000	14,000
C. & O. Piers, Newport News.		
Cars on hand	1,291	1,217
Tons on hand	64,550	60,850
Tons dumped	94,118	47,927
Tonnage waiting	1,970	2,200

Pier and Bunker Prices, Gross Tons

PIERS	April 8	April 15†
Pool 9, New York	$5.40@$5.80	**$6.25@$6.50**
Pool 10, New York	5.20@ 5.40	**5.80@ 6.10**
Pool 9, Philadelphia	5.40@ 5.70	**5.60@ 6.00**
Pool 10, Philadelphia	5.00@ 5.40	**5.50@ 5.80**
Pool 71, Philadelphia	5.65@ 5.90	**6.00@ 6.25**
Pool 1, Hamp. Rds.	4.50@ 4.70	**4.70@ 4.80**
Pools 5-6-7 Hamp. Rds	4.25	**4.65@ 4.80**
Pool 2, Hamp. Rds.	4.45@ 4.50	**4.50@ [illegible]**
BUNKERS		
Pool 9, New York	$5.75@$6.25	**$6.40@$6.65**
Pool 10, New York	5.55@ 5.80	**5.90@ 6.10**
Pool 9, Philadelphia	5.60@ 5.90	**5.85@ 6.10**
Pool 10, Philadelphia	5.30@ 5.60	**[illegible]@ 6.20**
Pool 1, Hamp. Rds.	4.75	**4.90**
Pool 2, Hamp. Rds.	4.55	**4.75**
Welsh, Gibraltar	40s. 6d. f.o.b.	40s. 6d. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	40s f.o.b.	40s. f.o.b.
Welsh, La Plata	50s f.o.b.	50s. f.o.b.
Welsh, Genoa	42s. t.i.b.	42s. t.i.b.
Welsh, Messina	38s. f.o.b.	38s f.o.b.
Welsh, Algiers	38s. 6d. f.o.b.	38s. 6d. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	38s. f.a.s.	38s. f.a.s.
Welsh, Teneriffe	38s. f.a.s.	38s. f.a.s.
Welsh, Malta	42s. f.o.b.	42s. f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Alexandria	45s.	45s.
Bombay	38 rupees	38 rupees
Capetown	39s.	39s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	April 8	April 15†
Admiralty, Large	27s. 9d.@28s. 3d.	**28s.@28s. 6d.**
Steam, Smalls	19s.@19s. 6d.	**19s. 6d@20s.**
Newcastle:		
Best Steams	23s. 9d.@24s. 3d.	24s.
Best Gas	24s @25s.	*24s.@24s. 6d.*
Best Bunkers	23s. 6d.	**23s. 9d.**

†Advances over previous week shown in **heavy type**; declines in *italics*.

North Atlantic

Quotations Up; Due More to Scarcity Than Increased Call

Non-Union Mine Developments Strengthening Factor — Consumers Who Built Up Reserves Not in Market — Those Relying on Non-Union Tonnage Must Pay High.

DEVELOPMENTS in the non-union mine fields have strengthened prices. Quotations are much higher than on April 1, but more because of the scarcity than increased demand. A large tonnage has been bought by big shippers to cover contract orders which were based on non-union operations since closed down.

Consumers who safeguarded their reserve supplies are out of the market, but those who planned to buy non-union spot coal during the strike are paying high for this tonnage. The supply of coal is uncertain, as mine resumptions cause a heavy volume of shipments one day and an insufficient amount the next. The export movement from Baltimore increased during the first ten days of April.

PHILADELPHIA

The situation is growing uncertain, as no shipper can tell twelve hours in advance whether he will have coal or not. Prices also move in an uneven manner, as some non-union producer who has probably lost a few days, quickly effects a resumption and then has more coal than he can immediately handle. In other cases the demand is so strong, that the same shipper is enabled to get a greatly increased price.

Despite whatever inroads have been made in non-union sections the producers are satisfied to fight the issue out along the present plan of trying to produce as much coal as possible with non-union labor.

Considerable stir was made in the market recently by good buying by the steel interests, and the shippers are mostly quoting on spot coal subject to prior sale. For the most part the consumer is still uninterested, and it is altogether possible for the market to drift along six weeks yet with little or no change in present conditions.

There is some little activity at Tide. As much of this business is done on a contract basis the shippers are no doubt making extra efforts to meet their obligations, as a number closed business predicated on their ability to operate non-union mines.

NEW YORK

Developments in the non-union mines have tended to strengthen the situation considerably. Some of the larger producers who operate both union and non-union mines and who have large contracts to fill, have bought heavily, creating a demand which resulted in a stiffening of quotations. The steel companies also were reported as heavy buyers.

The full effect of the closing down of many non-union mines cannot be determined until after the Easter holidays. Under normal conditions the miners would have remained at home from Thursday before Good Friday until the following Tuesday.

There is a heavy demand by the line trade and quotations are slightly stronger than on the Tidewater basis. At the various Tidewater piers there were reported on April 13 between 1,800 and 1,900 cars, the majority of which was coal from along the Baltimore & Ohio and New York Central lines. Demand was not strong and while there were many inquiries not every inquiry resulted in an order.

Southern coals are still being brought here. As indicated in another column the gas and electric companies in Greater New York were in good condition to withstand the strike for several weeks to come.

BALTIMORE

From the mining regions that supply Baltimore, come reports of further closing in the non-union fields. The Easter holidays undoubtedly have contributed to the decline in movement. For the past two or three days it has been almost impossible to pick up soft coal. Practically no Pool 9 is to be had at this writing, and this also applies to Pool 10. Some little Pool 11 has been on the market at prices ranging $2.50@$3. An inferior grade of gas mine run is also offered from West Virginia, but the price asked, $2.50@$2.75, has not been attractive to buyers.

It is rather remarkable that the demand has not been accelerated, and consumers seem to be traveling on existing stocks without particular worry as to the near future.

The export situation for the first ten days of April showed improvement over the same period of March and more than the total of the entire month of February. Three vessels cleared, two for Egypt and one for Cuba, for a total of over 14,000 tons cargo and 1,500 tons in bunkers.

CENTRAL PENNSYLVANIA

The U.M.W. have made considerable gains in the number of non-union miners taken from the mines. At Windber, 2,500 miners are reported out, a few men remaining at the mines, but there is no production.

Many of the foreign miners are making preparations to go to their homes in Europe and should the strike continue for another month, it is expected there will be a general exodus.

In the Foustwell field of Somerset County, notices of shutdown were posted last week and the miners were ordered to remove their tools and mine foremen are removing the machinery. The men have been advised to seek employment elsewhere as the mines will not be reopened until non-union miners ask for the opening.

FAIRMONT

Although no coal was being produced during the first week of the strike at any union mine, production was continued at approximately 65 non-union mines and the utmost effort to force a shutdown at that class of mines failed. Spot demand is beginning to show signs of revival and Eastern buyers were offering as much as $2.50 a ton for mine run. Some railroads are reported to be in the market for more coal. Railroad fuel requirements are necessarily low, however, in view of the light movement of tonnage.

UPPER POTOMAC

In the Georges Creek region the suspension is almost complete. In the Upper Potomac, mines were operating to some extent during the first week of the strike, there being from 16 to 20 in operation, although running time was restricted owing to a poor market. Where miners show a disposition to work, they are being given an opportunity to do so although production is not profitable.

South

BIRMINGHAM

Increasing activity among the iron-makers is giving aid to the production and movement at a time when the shortage in demand from commercial and domestic sources would prove very prejudicial to the employment situation in the district. The output is now on a basis of about 325,000 net tons per week, which is close to normal, due principally to the requirements of the furnace companies and to the stocking which has been done by the railroads, the latter source of disposition being the only direct benefit so far accruing from the strike.

Commercial demand is only slightly improved. Some contracts are being made to replace those expiring, but there is not any great amount of business in the way of new agreements. The spot trade is still restricted, although the tone of the market as a whole is better.

Some domestic contracts are being made, but there is an inclination on the part of dealers to have deliveries deferred beyond April. No changes of note have been made in prices of steam and domestic.

The leading coal-carrying lines have such a large percentage of their equipment under load with company fuel that operations served by them have been short of cars to some extent and the roads have not been able to take their usual weekly quota. The supply of mine workers is much in excess of the demand.

VIRGINIA

Production has reached the highest figure since December, 1920, being in excess of 70 per cent or at the rate of over 150,000 tons a week, with mines on the C. C. & O. producing the best. Virginia mines are not being handicapped in any manner by the strike. Although spot buying is limited, nevertheless there are signs of a revival of interest as reflected in a larger number of inquiries.

Anthracite

Retail Sales Moderate, but Yards Show Effect of Strike

With Larger Sizes Nearly Cleaned Up, Companies Find Market Better for Storage Pea Coal—Buckwheat Only Steam Size Moving Well, Others Becoming Scarce.

THERE is only moderate buying at retail, but yard stocks are beginning to show the effect of the mine suspension. The company producers are finding a better market for their storage pea coal, as the larger sizes are nearly cleaned up. This condition affords them an opportunity to work off the heavy volume of pea which had accumulated prior to the strike. In the steam market only the buckwheat movement from mine storage is good, as the other sizes are becoming scarce.

Many dealers are attempting to place orders now for delivery after the strike, with the idea of obtaining preference in shipments. Producers, however, are not inclined to take on firm business at present.

NEW YORK

So far there has not been any heavy demand for coal and even if there had been some of the companies have nothing to sell larger than pea coal. There is said to be some independent domestic coals at Tidewater but even these are not in demand. Line demand is much stronger but most producers have little to offer as most of their product was shipped to Tidewater.

Retail stocks, particularly in the smaller towns in the Metropolitan district, are being depleted and it is expected the dealers will soon come forward for more coal only to find that the only domestic size available will be pea coal. In this way the producers with heavy stocks of pea on hand expect to clean up their storage piles.

While quotations as high as $8.50 were heard for independent stove and chestnut coals it was admitted that the average selling price for these was hardly above $8.25, with considerable going at company circular. Some washery chestnut was offered at $7.

PHILADELPHIA

Remarkably warm weather took all snap out of the retail market during the past week. However, even what little coal has been taken since the first of April has made a considerable impression upon the visible yard stocks, and those dealers who had thought the suspension might not last over a month are questioning whether they adopted the right policy in going into April with moderate supplies.

Producing companies have practically cleaned up all storage of family sizes, except pea, and are unable to accommodate the retailers. This has created considerable business for the companies on pea coal.

Numerous retailers are already endeavoring to have their shippers take orders from them for delivery when the strike is ended. Without absolutely declining the orders some companies are acknowledging the receipt, promising to give definite advice as to when they will be ready for shipments. Some independents have also sounded their customers as to the probable tonnage they might need on the old allotment basis, and have received many responses from their customers.

BALTIMORE

The hard coal situation is naturally at a standstill. The local demand is very light and is being supplied from stocks on hand and everyone is in a waiting frame of mind as to possible storage against next winter.

ANTHRACITE FIELDS

So far there has been no trouble of any kind in the anthracite fields. The pay the miners have just received is the largest in some time. It is really larger than the amount mined in the last two weeks of March would indicate as a good deal of coal was left in the mine pockets to supply local trade.

In the vicinity of Wilkes-Barre the men are expecting a long-drawn strike, but in Scranton the reverse seems to be the case and the men believe that the suspension will only last a few weeks.

In case the strike is prolonged it is possible that it will be very much more serious than it was in 1902. There are many more foreigners in the field now than there were then and the radical element is greater. Since the strike commenced a large amount of I. W. W. circulars have been distributed.

BOSTON

Shipments of odd lots are still being made from New York piers, but the volume is by no means large. It is a striking fact that notwithstanding the suspension which is now in its third week there is only scattering inquiry for domestic sizes. Retail dealers have reserves varying from six weeks to three months.

Retail demand has fallen off sharply since mild weather set in. One large distributor has lately been making less than 30 per cent of the retail sales that were current early in the month.

Prices are unchanged, except that one of the originating companies has been bold enough to pass on to the buyer a 50c. charge for picking coal up from storage.

BUFFALO

Some companies are selling coal out of storage supplies, but as a rule the trade is flat. Colder weather has stimulated the buying but little, as the majority of dealers have plenty on hand to last them for weeks. Many Canadian dealers' stocks will last through May.

The first anthracite cargo left here during last week, but only two have been loaded so far in advance of the navigable season. From present appearances April will see a smaller Lake trade than for many years. Leading shippers say they may have no coal for the Lake trade until the strike is settled.

Coke

CONNELLSVILLE

In the first week the striking in the general coke region quite exceeded any expectations of the operators. In the second week there was a further decrease in operations in the lower Connellsville, with some striking in the upper Connellsville or Greensburg basin.

No particular efforts were made by operators last week to resist the strike tendency, the Easter holidays furnishing an unpropitious time since the disposition to work is always light then. Independent operators are disposed to let the Frick company take the lead in attempting to get works in operation again, and active efforts are now expected.

There has been nothing like a regular market for furnace coke. There have been some small offerings, but at fancy prices, which the furnaces would not pay except in an occasional emergency.

The *Courier* reports production in the Connellsville and lower Connellsville region during the week ended April 8 at 101,530 tons by the furnace ovens, and 32,890 tons by the merchant ovens, a total of 134,420 tons, a decrease of 15,540 tons. Production by merchant and furnace ovens combined is reported at 102,530 tons in Connellsville, an increase of 14,580 tons, and 31,890 tons in the lower Connellsville, a decrease of 30,120 tons.

UNIONTOWN

Opposing factions in the effort to unionize the Connellsville coke region virtually admit that upon the outcome of the work by organizers during the Easter holidays will depend the success or failure of the movement.

There were very little gains made during last week by union organizers, with the exception of the walkout Monday at the miners centering Uniontown. Some gains have been made in the Star Junction district. The Frick mines centering at Connellsville have consistently resisted efforts at unionization despite the fact that all organizers have concentrated a drive on workmen there.

Were there any loose tonnage either of coal or coke the market might ascend to new price levels. But there is very little to be had of either and prices therefore are secondary. Nominal quotations for furnace coke may be placed at $5.50, foundry a dollar higher and coal, all grades, at $2.50. No effort now is being made to distinguish grades where price is concerned. When a new market figure is struck all grades command the same figure.

BUFFALO

Producers are about out of the market, owing to the difficulty experienced in getting coal. There will be little coke offering in this market before May 1, perhaps later. Quotations made in the past few days have been more or less nominal.

Chicago and Midwest

West Enviously Watches Trade Flurry in East

Region Is Full of Coal and Buyers Let It Severely Alone—Screenings Show Only Signs of Life—Prices Stiffen—Sales Few and Small.

THE coal trade of the Middle West is spending most of its time gazing eastward and wishing that some of the demand that appears to have sprung up there would develop here. Certainly there is as little business west of Ohio for coal men nowadays as there could be without a complete collapse of Western industry. After most of the selling agencies in Chicago had withdrawn their field men hopelessly, a number of western Kentucky producers scoured the country in a mopping-up campaign for business. It netted them next to nothing. The region has a good deal of Eastern coal in it and there remain on track in Illinois a few thousand cars of sized fuel but the demand simply isn't here. Prices are uncertain on prepared coal and remain firm on screenings because there is hardly any to be had.

Naturally the principal interest in the Midwest centers on non-union coal from the East. It was freely offered at the end of the week without finding much of a market even though reports had it that the East would soon absorb so much that the West might be caught short some fine morning. Most of this coal is mine run. Such prepared sizes as are actually sold and delivered sometimes look strangely degraded when they arrive. Spot prices on mine run range from $1.60 up to about $1.75 though an effort is made here and there to boost the level to $1.90. Contracts can be written on this coal at $1.75. Not many have been signed.

The whole region is full of coal. Storage piles are only just beginning to show the effects of invasion and except for a slight awakening of interest in screenings and steam coals a week ago, there has been no market to speak of. Screenings have strengthened in price since last week and mine run has followed it upward. Southern Illinois screenings are up to $2.50@$3. Indiana Fourth Vein quotations are $2@$2.50 and Fifth Vein $2.25@$2.50. The supply is short indeed. Other quotations are shown in the Weekly Review.

The strike progresses without causing any labor disturbance in the Midwest. Feeling grows tenser week by week but there have been no outbreaks in the fields. Nothing has occurred here that might be called a definite step toward a settlement between operators and miners.

CHICAGO

Those coal concerns in Chicago which do not operate any Kentucky or Eastern mines are doing no business worthy of the name, for the Chicago market is flat. Screenings sell fairly well when there are any to be had, which is seldom and in small quantity, and they bring a heightening price because only a few cars are left in either Indiana or Illinois.

Northern and central Illinois is practically cleared of all carry-over, but the Southern counties still have about 6,000 cars on track and three or four good-sized storage piles at mines. Practically all of this is prepared sizes which are used to patch out customers' supplies thus keeping up a semblance of trade connection. Kentucky and smokeless coals are offered in great quantity here but there are few buyers.

INDIANAPOLIS

Prices of every variety of coal sold by retailers in Indianapolis with the exception of Linton, No. 4 Indiana lump, anthracite and coke, have declined 25c. to 75c. a ton. These are the usual spring reductions. It is doubtful how long they will remain in effect, however.

The new prices are as follows: Linton No. 4 egg, $5.75; Linton No. 4 mine run, $5.25; southern Illinois egg, $7.50; southern Illinois 6-in. lump, $7.50; Kanawha lump, $7.50; eastern Kentucky lump, $7.50; Hocking Valley, $7.50; Pocahontas mine run, $7.25; Pocahontas lump, $8.50; Pocahontas shoveled lump, $8.

According to Indianapolis operators, it will be a question of only a short time before steam coal supplies on sidings and at mines will be exhausted. Thus far there have been no increases in prices. No urgent demand is expected for another month. Indiana operators believe the situation will then become graver each week. Indiana went into the strike with a sixty-day coal supply.

SOUTHERN ILLINOIS

Quietness prevails over the entire southern Illinois field. At one or two places in the Williamson-Franklin field the mine foremen and bosses have quit and clerks and salesmen from the general offices have been put on to man the pumps and keep steam up and do general police duty. No disaster of any kind has been reported so far in any of the southern Illinois fields.

Some destitution still prevails in Williamson and Franklin among the miners' families. The miners seem to be confident everywhere that the Government is going to sooner or later step in.

Railroad tonnage remains on track at many mines and at others there is a fairly good supply of screened sizes, but no screenings.

LOUISVILLE

Reports received from jobbers and brokers show that demand here is quiet for all grades of coal, and that many mines are idle for lack of business. Heavy tonnages on board cars are being reduced slowly, and operators have no inclination toward increasing unsold stocks. Jobbers and operators are hunting for new markets, but with no more success than they had last week.

The strike in Kentucky is a negligible factor, as with the exception of a very few mines in Southeastern Kentucky, none of the fields are shut down.

One report states that about 20 per cent of the mines in the Harlan district are down, and about 75 per cent in Bell, Whitley and Knox fields where the union is strongest. However estimators of these percentages are not giving proper consideration to lack of demand, which has more mines down than labor troubles, according to well-posted coal men.

Local coal men think that industrial consumers will start buying coal the last of the month and prices may advance then.

ST. LOUIS

The dealers' yards still have plenty of domestic coal and there is practically no demand in city or country. Steam in dealers' hands will be good for at least 60 days.

Locally carload steam finds no buyers excepting for screenings if there are any on the market. Most plants have pretty fair storage supplies but steam coal other than screenings is at a standstill. Here and there some operator tries to get a little bit better price and from now on this will likely continue for the feeling prevails that coal now on track will bring better prices later.

WESTERN KENTUCKY

Demand for western Kentucky coal continues slow, operators, jobbers and brokers reporting that the tonnage is available at approximately the same prices as were in effect on April 1 or late March but that buyers are filled up, anticipating lower prices if the strike is broken, and are not showing any interest.

On April 8, it was reported that there were over 800 cars of coal on track ready to move from western Kentucky. Very few mines have been operating, and these but part time, as a result of the very slow demand, report after report stating "down—no business."

Producers are endeavoring to secure a mine-run basis of around $2.10, as with the peak prices of labor still in effect, production is costing something over $2 a ton, including selling expense.

Canada

TORONTO

The strike has so far had practically no effect here. Neither domestic nor industrial consumers appear at all anxious to place orders. Dealers note some increase in inquiries for bituminous but actual business continues light. April receipts have been confined to a little bituminous. Quotations are as follows:

Retail	
Anthracite, egg, stove and nut	$15.50
Pea	14.00
Bituminous steam	9.25@9.75
Domestic lump	11.25
Cannel	16.00
Wholesale, f.o.b. cars at destination	
¾-in. lump	7.00@7.75
Slack	6.00@6.75

Northwest

Trade Remains Dormant But Hopes Are Rising

Anticipated Drop in Freight Rates May Awaken Some Inland Demand as April Ends—Dock Stocks Still Heavy and Big Cargoes Will Arrive Soon.

COAL business generally is dull throughout the Northwest region. Buyers still show no inclination to worry over the strike. Some effort on the part of dock men with large storage piles to unload has had a slight softening effect on certain coals but not enough business has been done to sink this effect in deeply.

The carryover of April 1 has not been reduced much. Something less than a half million tons of coal from the Eastern fields is now definitely on the way toward the Head-of-the-Lakes. It is expected to appear within a week or so, now that the ice is about out. Prices on larger sizes are in a slump while screenings have been holding firm. Although there is little demand anywhere, some shipments Inland are expected to start about the end of the month when a freight rate reduction takes effect.

MINNEAPOLIS

At this time there is hardly any business being placed, except for such coal as is likely to be required before long. No one is at all alarmed over the situation, least of all the consumer, who seems to be well pleased with his prospects as to coal prices.

Buyers hold confidently to the faith that there is to be a drop in freights and another in production costs. And the coal men as a rule are inclined to agree, though the first is contingent upon matters outside the coal trade's control and the second is contingent upon the readjustment of wage scales to a lower basis.

Coal men are sitting very tight and decline to urge anything. If buyers play their own judgment, the coal trade will gladly book and fill the order. But where advice on the subject is sought, the coal men are inclined to suggest that they expect lower prices for coal as a result of the negotiations which will follow the strike.

The docks have an ample supply, and the retail yards are reasonably filled. There is ample coal on hand in the Northwest to run at least 25 per cent of a season. This applies to both soft coal and hard. So far as the demand for consumption is concerned, the supply of hard coal would last for six months. But of course refilling of the docks should be under way before that length of time is up, or there will be a shortage next winter. There is more commercial and industrial demand through the spring and summer, but with better than 3,000,000 tons of soft coal for commercial purposes on the docks, there is easily enough for 90 days or more.

In addition to the stores on the docks, it appears that the mines have not exhausted their stocks above ground, at a number of all-rail mine sources. Some of this store is still moving to the Northwest from time to time.

DULUTH

Shipments for March from the Head-of-the-Lakes docks showed a decided increase over those of the month before and were far in excess of shipments of March a year ago. Official figures just released show that 22,249 cars of coal went out from the docks here last month, and only 7,850 were shipped during March, 1921. Shipments for February of this year amounted to 18,260 cars.

This run of shipments was due to dealers and public utilities stocking up before the coal strike. However shipments have been off ever since April 1 and there is little sign of a pick-up. Confidence that the strike will be of short duration or that there is sufficient coal on docks is steadily increasing.

A survey completed this week shows 3,000,000 tons of bituminous and 500,000 tons of anthracite on docks. Additional reports from lower ports have it that between 30 and 40 cargoes are loaded there and waiting for the opening of navigation here. The opening of navigation will not be long delayed now. This week for the first time the end of the sheet of ice which covers Lake Superior has been visible from the heights of Duluth. The harbor is nearly clear of ice.

A downward revision in prices is noticeable. Bituminous has dropped 50c. to $6.50 for lump and $6 for run of pile. Screenings are firm and stiffening at $4.50@$4.75. This is caused by the fear that a possible settling of the strike would find many docks with large stocks on hand and no contracts.

A reduction in freight of possibly $1 a ton from mines to dock, anticipated for next month, is holding the attention of buyers generally.

MILWAUKEE

Coal business is extremely quiet in Milwaukee. Rail receipts from Illinois and Indiana and of Pocahontas from West Virginia, are fairly liberal. This plus the fact that ten large cargoes at Lake Erie ports, destined for Milwaukee, await the opening of Mackinaw, makes consumers confident of plenteous supply.

Prices remain unchanged. Contrary to April custom big buyers are waiting for lower prices instead of contracting now. The State Department of Markets predicts a reduction in prices will be made at interior points because of the reduced freight rates from Wisconsin lake ports, which will go into effect on April 28.

New England

Trade Continues Very Dull Despite Supply Conditions

Smokeless Firmer at Hampton Roads—Softness of Marine Freights Offsets Rise in Pier Prices—Central Pennsylvania Grades Scarce—Buyers Still Indifferent.

A TIGHTENING at the sources of supply has not yet affected New England markets, and business continues very dull. Smokeless coals have firmed up at Hampton Roads but demand has not increased and the marine freight softness about offsets the higher pier prices. Central Pennsylvania grades are scarce but buyers are unmoved in the face of higher prices, which are largely nominal.

The textile strike continues to keep down current industrial fuel needs. Reserves are good in most instances and the old feeling of indifference still prevails among coal buyers.

At Hampton Roads the market for the past week has grown steadily firmer. Coal that was offering freely ten days ago at $4.60 has been quoted as high as $4.80 and it is quite likely there will be a further lift in quotations. Movement coastwise has somewhat diminished, but this is more than offset by a noticeable decrease in supply.

The New River district seems much more affected by the suspension than the trade supposed would be the case. The fact that non-union districts in central Pennsylvania have been obliged to suspend so generally is likely before long to have an effect upon the general market.

For Inland distribution at points like Boston, Providence, and Portland prices are as yet unchanged. There is every reason to expect, however, that quotations will harden during the next few days. Marine freights have their bearing on these prices, however, and there is now so little inquiry for spot barges and vessels that a somewhat reduced rate may offset advances f.o.b. Hampton Roads.

There seems an utter dearth of Pennsylvania grades offering in this territory. Movement through the Hudson River gateways has dropped off, due to the suspension, but most of the small tonnage now coming through is on fuel contracts with the railroads. The few quotations that are heard on Pennsylvania grades are only nominal, for only relatively few operators are in position to make spot shipments.

Eastern Inland

Inquiries Increase, Prices Rise, Buyers' Market Wanes

Steel Plant Buying Causes Flurry—Many Mills Relied on Non-Union Supply, Some of Which Is Unavailable—Those Lacking Reserves Face Mounting Prices.

THE buyers' market seems to be passing, temporarily at least. Inquiries are increasing and prices are rising as a result of the non-union uneasiness. Buying by steel plants has mounted to a flurry, as the mills had not stored much tonnage, relying on non-union supply, some of which is not available. Most industrial consumers are out of the market, using their reserves, but those who are not so fortunate are faced with mounting quotations.

Lake business is progressing and much non-union tonnage is being loaded. About 400,000 tons have been dumped so far this season, as compared with 9,700 tons at this time last year.

CLEVELAND

The spread of the strike into the non-union fields has been met with sharp reaction upon prices and demand in this district. The heaviest demand is coming form the steel mills.

Outside of the steel mills the fuel situation seems to be less of immediate concern. Stocks are fairly large and there is still considerable coal on hand among dealers for sale. No acute shortage is likely to develop for a few weeks. If the non-union miners do not resume production soon, the situation will take a serious turn. Many steel mills will not only be compelled to shut down, but their customers will begin to cancel shipping orders, because coal will be scarce for general manufacturing purposes.

In the meantime prices are pointing upward. Loading of vessels at the lower docks is proceeding. For the season to date nearly 8,000 cars have been dumped against about 9,700 cars in the same period one year ago. Tonnage to take 100,000 tons of coal from lower ports to Buffalo has been lined up.

Receipts of bituminous coal at Cleveland during the week ended April 8 do not reveal any rush for coal, total arrivals being 200 cars under the preceding week. Industries received 902 cars and retail yards 216 cars. Of course, much of this coal was loaded at the mines before April 1.

COLUMBUS

A considerable amount of non-union coal is being received. There is also considerable Ohio-mined coal available for sale as the tracks at certain junction points are still loaded. Despite the suspension there is no increase in demand of consequence. Inquiries are more numerous, but these are for small lots mostly as the larger consumers have been pretty well supplied.

There is a definite reduction in certain grades on track awaiting sale. Retailers have not advanced prices and are now selling Hocking lump at $6; West Virginia splint lump at $6.75 and Pocahontas lump around $7.50@$7.75. These prices are considerably lower than those prevailing for several weeks previous to the suspension.

Operators in Columbus who are interested in the non-union fields are looking around for Lake contracts and a few have been secured. Prevailing prices are $1.75@$2 for 1½-in. and 2-in. lump.

PITTSBURGH

By the end of the second week there were reports of some non-union strikers going back to work while fewer new strikes were being reported. The strikes have been thickest in the lower Connellsville or Masontown field. The Frick company has started a number of plants in the old basin, to relieve the situation, but only for making coke, no coal being shipped.

The strikes in the non-union districts are quite important to the iron and steel industry, on account of the industry's large dependence not only on Connellsville coke but on Connellsville coal, not much striking in this respect having been anticipated.

The market for Pittsburgh district coal practically disappeared April 1. For a few days there was more or less of a market in Connellsville as well as in Westmoreland coal. These practically disappeared later, and there was some trading in Somerset coal, but this in turn has been dwindling. Offerings have not disappeared entirely, but prices asked so mounted that prospective buyers lost interest.

Some of the coal buying has been by consumers who stocked, but who wished to add to their stocks. Other buying has been by small consumers who did not stock.

In some quarters a turn in the tide of non-union strikes within a week or two is expected. It is the common view that they cannot last long enough to connect with the time, certainly quite a distance in the future, when the strike at the union mines will really come to a head.

BUFFALO

Inquiry has increased although no active demand is prevailing. Few consumers have as yet run out of coal, but the likelihood of getting any large supplies in the near future is remote.

The districts that were counted on to supply plenty of non-union coal are producing only small quantities, and a great many mines are down entirely. Some expect this to last for two months or so, while others say the non-union men will soon be working again.

Any coal that arrives here at present has to be sold at a good deal less money than the prices reported to be prevailing in the Pittsburgh market. Operators who quote high prices in the local trade are advised that consumers will not pay the big advances asked, some of the latter saying that they will close down their plants before doing so.

Coal prices are more or less a matter of bargaining. Some three-quarter steam coal sold here last week at $2.50, while similar coal at the mines is quoted about $1 higher by operators. Steam slack is worth almost as much. High-grade gas lump at the mines is quoted at $3.75.

DETROIT

Neither steam nor domestic sizes are in active demand. So far, the seeming indifference of buyers to the strike is a unique feature. Shipments from the non-union districts are apparently meeting the requirements of those dependent on renewal of supply at short intervals. While the amount of coal coming to Detroit is not large, jobbers say it is usually possible to find a little free coal on tracks when inquiry appears for it. Retail dealers have considerable coal on hand and they are not adding to their stocks.

West Virginia or Kentucky 4-in. lump is quoted at $2.25, 2-in. lump and egg, $2, mine run, $1.40, nut, pea and slack, $1.35. Smokeless lump and egg is $2.75@$3, mine run, $1.85, nut, pea and slack, $1.50.

EASTERN OHIO

The strike resulted in a complete closing of mines in eastern Ohio except that a negligible quantity of fuel is being produced by stripping mines whose employees are not affiliated with the United Mine Workers but subject to separate and distinct local organizations. It is estimated that these operations loaded about 20,000 tons during the week ended April 8.

The aggregate number of mine workers affected by the suspension is about 16,000. The entire body is idle except those designated to remain at the mines to protect the property, operate pumps, etc. No disturbances have been reported in the field since the inception of the strike and the attitude of the miners seems to be more toward taking a vacation than participating in a strike.

While many mines entered the strike period with moderate quantities of "no-bill" coal on track, total being estimated at somewhere between 500 and 1,000 cars, this fuel has been moved to destination notwithstanding that demand was woefully lacking during the first week of the strike.

Most all steam users continue to be well-stocked and operators and jobbers state that there is little demand. However, because of the very limited supply of spot coal available from Ohio mines, there has developed a shortage of slack accompanied by decided stiffening in prices. Dealers in non-union coal state that purchasers are few although this coal is available in almost any quantity desired.

NORTHERN PANHANDLE

Production has been cut in half by the strike and the United Mine Workers are waging a desperate campaign, especially those in the vicinity of Moundsville, and have succeeded in closing two of the Marshall County mines. Expiration of contracts on April 1 of course is responsible also for a part of the loss in production.

Cincinnati Gateway

Steel-Trade Demand Boosts Gas Mine Run and Screenings

Mines Sell Lump and Block on Mine-Run Basis to Make Screenings—Non-Union Output Contingent on Demand—Kentucky Production Maintained on 50 Per Cent Basis.

DEMAND from steel makers has upset this market. Gas mine run and screenings have jumped 50c. and are out of line with other coals. Mines are selling lump and block on a mine-run basis and are screening out this tonnage to get the top of the market. Shipment of smokeless coals to the seaboard has improved the situation on these fuels, but prices have not been increased much, if any.

Non-union production is still limited by the demand rather than by any labor trouble.

LOW-VOLATILE FIELDS

New River and the Gulf

Judging from the well-organized effort launched during the first week of the strike to induce non-union miners to join the ranks of the strikers, New River and Mining Gulf are considered the strategic points at which to attack the non-union fields. In the New River field the United Mine Workers' organization has succeeded in bringing many former members back into the fold. Idleness growing out of a poor market has made it easier than would have otherwise been the case.

Organization effort has been confined to the edge of the Winding Gulf field nearest the New River district and this work has been stopped for the time being by an injunction. There has been a large movement over the Virginian to Tidewater. Lack of market is restricting the output more than the strike. Inquiries are beginning to multiply but spot buying has not reached any larger proportions.

Pocahontas and Tug River

As showing how little effect the strike is having on the mines in the Pocahontas field, production in that district is now at the rate of about 350,000 tons a week. There does not appear to be any sign of dissatisfaction among the miners, all of whom are working. When a better demand develops it will be possible to ship even a larger volume of coal.

The only mines in the Tug River region not in operation are those which have been shut down for many months because of lack of orders. No inroads have been made in any manner by the strike. Shipments are mostly to Western markets and largely on contract, though there are some signs of increased spot buying.

SOUTHEASTERN KENTUCKY

It has been reported that a steel plant has just placed an order for 2,500 cars in southeastern Kentucky and this with other fairly large-sized orders from the North and Northwest, has improved the situation. Production has been about 50 per cent of capacity since April 1, but indications are that next week will show an increase.

HIGH-VOLATILE FIELDS

Kanawha

All but about 20 mines have ceased to produce as a result of the strike. No mines on the Kanawha & Michigan are being operated but about 200 tons a day are being produced on the Kanawha & West Virginia. Market conditions have something to do with the idleness, as prices still remain on a low level owing to the poor spot demand, although inquiries are beginning to become a little more numerous.

Logan and Thacker

There has been no interruption to mining operations in the Logan field. Production has continued at about 50,000 tons a day. So far there is no activity in spot buying, much of the coal moving on a contract basis. The spot demand, however, shows signs of becoming somewhat heavier, if inquiries are to be taken as a criterion.

Although the U. M. W. claimed that the Stone Mountain Coal Co. miners had gone on strike, there has been no cessation of operations at any plant in the Williamson field. There is only minimum production under existing market conditions and whenever a better demand develops it will be possible to speed up to some extent. Were it not for contract shipments, it would be difficult to find an outlet for all the coal produced.

Northeastern Kentucky

Mines on the Big Sandy and its tributaries are producing at the rate of 150,000 tons a week or more. A few mines have suspended but only to to the extent of about 3 per cent of actual tonnage. Whatever loss there is in production is due largely to "no market."

CINCINNATI

There had been a little flurry here following the demands from seaboard, but this had settled itself within two or three days, but when the Mahoning Valley district pounced upon the available coal here and called for more, the market perked up and in three days scored an advance of 50c. on the better grades. This resulted in some strange values being recorded in that the gas coals were brought on a plane with the smokeless sizes and in some instances were held higher.

Smokeless has been in a little better position though this is not reflected in prices. A larger tonnage is moving to seaboard where the demand is quickening to the place that the West will not be the only spot in which such coal can be placed. The call for screenings by steel plants and Inland industries was the cause of an advance in price and this has held. The lump and egg drags as a result of the passing of the domestic season.

Southeastern Kentucky reports that a large number of non-union miners are taking to the hills for farming for the summer and their passing is slowing down production. This has resulted in a cutting down in the accumulation of loaded cars that were being carried in the district and a demand for higher prices.

Only one change has been noted in the retail prices. Those firms that had been offering nut and slack at \$4@\$4.25 for several weeks past have dropped out of the market and the range now is \$4.50@\$5.

West

OKLAHOMA

Oklahoma will not be seriously affected by the strike. Railroad officials claim they have large stores of coal in their yards, and the dealers have stored heavily. Many large industries have recently converted their plants to oil burners, and still others made hasty conversions when it became apparent that the coal strike would materialize.

Approximately 7,000 coal miners in Oklahoma laid down their tools, and nearly 100 mines were affected. All coal mines in the McAlester section, with the exception of the Pittsburgh County Coal Mining Co., shut down on April 1. The Pittsburgh mines are operated with non-union labor and will not be affected.

KANSAS CITY

Notwithstanding the strike the market is practically dead. This condition is likely to continue for some time as there is ample coal in storage both for steam and domestic use. No change in prices is noted and unbilled coal at the mines is moving very slowly.

DENVER

Lack of business is about the only complaint the operators are raising. The strike's throttling effect on production is growing less and less and if business justified it they say they could open up most of the operations that are now closed.

Stocks are big enough throughout the region normally fed by Colorado mines and weather has been warm enough to combine to hold down demand, but in spite of that the bituminous operations in the southern part of the state are producing about 90 per cent of capacity today. This is probably a bigger output than the region raised before the strike. Prices show no material change.

SALT LAKE CITY

Retail business has been quite good during the past few days as the result of a sudden drop in the temperature, followed by a heavy snowfall. The strike situation appears to be about the same. According to figures just received from the office of the chief mining inspector, production for March showed an increase, the figures being 434,022 tons. In February the tonnage was 402,492.

News From the Coal Fields

ALABAMA

J. B. Foster has been elected secretary-treasurer of the Mount Carmel Coal Co., with headquarters in Birmingham. He will also have supervision over the sale and distribution of the output of the company, which operates a mine at Mount Carmel, Walker County.

Labor conditions are tranquil in the Birmingham district, only a few instances being reported where mine labor has failed to report for work as usual. At several small operations in Walker and Bibb counties men are reported out, but these disturbances are purely local and will have no material bearing on production. Viewing the situation as a whole production is undisturbed and output is closely approximating normal. Ample coal can be produced on short notice to care for all outside requirements.

CONNECTICUT

The City of Bridgeport recently awarded contracts for approximately 500 tons of anthracite and bituminous coal, for use at the Municipal Garbage Plant. Only one of the bidders submitted figures on a yearly basis. Due to this fact the contracts awarded cover but a three-months' period. **Vincent Bros. Co.** got the anthracite order; **The City Ice & Coal Co.**, the bituminous needs; and the **Karm Terminal Co.**, the order for the buckwheat coal.

The American Coal Co., Hartford, recently let the contract for a new building on Edwards St. It will be two-stories high, of brick construction.

The A. H. Powell Co., Inc., coal dealers, New Haven, recently filed a certificate increasing the capital stock of the company from $200,000 to $300,000.

ILLINOIS

Peabody-Houghteling & Co., Chicago, is offering $1,250,000 first mortgage 7½ per cent serial gold bonds, issued by the **Southern Gem Co.**, a subsidiary to the Southern Gem Coal Corporation, Chicago.

The strike is having its direct effect upon the "white-collar" jobs in the coal industry too. Many of the big jobbers in Chicago and the operators who have selling organizations, are reducing their organizations to skeletons. "We can't afford to do otherwise" is the general explanation. So expenses are trimmed to the quick and in a few cases small jobbers are closing up their affairs and quitting the field. If the tie-up lasts until June 1, some of the strongest companies who are doing their best to hold their staffs together say they will have to make another cut. This situation gives rise to all sorts of stories about the instability of this company and that. When the **Fort Dearborn Coal Co.**, a twenty-five years old concern, discontinued its New York office permanently and closed up its agency in Cincinnati probably temporarily, let its Cincinnati representative, R. H. Boykin, go, and when William Fitzgerald, vice-president in charge of sales, resigned and returned to the Chesepeake & Ohio R.R., it was noised about that the company was quitting business. George Stahmer, president, declares the company is merely exercising good business judgment in a time of stress and that it is solvent and has no intention of closing up its affairs. He said the executives of the company are all remaining with it. During the last week, he says, it has closed some important contracts and that its business is on the upgrade.

An order from the Illinois Mine Workers has been received at Mt. Olive, by the miners of the **Hoosier Mine**, to have the mine and the airshaft retimbered throughout.

W. L. Robinson, of Baltimore, superintendent of fuel and locomotive operation for the B & O., was in Chicago a short time ago furthering plans for the International Railway Fuel Association convention to be held in that city May 22 to 25.

E. R. Keeler, sales-manager of The Taylor Coal Co. at Chicago is in Louisiana for a two-weeks' stay.

The Electrical Material Co., Inc., of Chicago, has moved to 158 West Lake St. Heretofore offices were located at 618 West Jackson Blvd., with materials stored at two different warehouses.

Several coal operating companies that keep sales crews in the field have called in their men recently for conferences. The coal trade generally is drawing a deep breath preliminary to a campaign of stiff competition as soon as the strike is over.

The Bell and Zoller Coal Co. is opening up a section of Zeigler No. 1 Mine at Zeigler, which was sealed off four years ago to stop a fire.

INDIANA

A report just compiled shows that more coal mine accidents occurred in Indiana in March than in any three months previously. In the one month more than 1,000 injury reports were filed, but a majority were of a minor nature.

John W. McCardle, chairman of the Indiana Public Service Commission, said recently that it is certain that all of the **Indiana coal road of the Chicago & Eastern Illinois R. R.** will not be abandoned as has been proposed by the company. The railroad has a petition before the Interstate Commerce Commission asking for permission to abandon service on the road. Mr. McCardle said that it has been demonstrated that certain sections of the road can be operated at a profit.

The Raymond Coal Co., Valparaiso, has been sold to **R. C. West**, of Gilman, Ill. Mr. West took immediate possession and will enlarge the coalyards and erect a number of new buildings.

The Howe-Coulter Coal Co., a Delaware corporation, recently filed papers with the secretary of state at Indianapolis, qualifying to do business in Indiana. The company was organized for the purpose of developing lands containing coal, clay mineral, gas or oil and $120,180 of the capital is represented in Indiana. Norman H. McClevey, of Petersburg, has been named Indiana agent.

KANSAS

Kansas production in 1921 was 31 per cent less than that of 1920, according to the annual report of the state mine inspector. The slump was due primarily to the general strike beginning when Alexander Howat, then president of District 14, United Mine Workers of America, began serving a 6-months' sentence for violation of the industrial court law by calling a strike on a small mine in that county several months earlier. The district was suspended by the international union Oct. 13, and it was well toward the close of the year before a large part of the miners resumed work. The total tonnage was 4,028,520, compared with 6,130,341 in 1920. The year's output was 935,009 tons of lump, 1,095,145 of sack and 1,998,366 mine run. These figures are viewed with interest as operators in this field have frequently asserted that methods used by miners in shooting in this field cause an unduly large percentage of the lower grades. Fatal accidents for the year, fourteen, made the smallest percentage in the last 25 years, the life loss being 3.72 for each million tons. The non-fatal accidents numbered 740, which is 183.68 for each million tons. The cause of the lateness with which the report was completed was that while the big operators, members of the Southwestern Interstate Coal Operators' Association, made their quarterly returns promptly, small operators did not do so until inspector Sherwood placed their names in the hands of the county attorney and they were notified they would be prosecuted if they did not comply with the state law requiring such reports.

In a case tried recently George Chaussard, of Franklin, a miner formerly employed by the **Western Coal & Mining Co.**, admitted that during the seven years he worked for the company he had filed twelve claims for personal injuries, part of them alleged to be permanent. The jury brought in a verdict in favor of the company.

KENTUCKY

The Supreme Elkhorn Collieries, Ashland, has been incorporated with capital of $175,000. E. E. Seaton, J. B. Thomas and L. G. Byrne, incorporators.

The Federal Trade Commission has issued an order to cease and desist against the Chemical Fuel Co. of America, Inc., of Louisville. The order prohibits the respondent from publishing and circulating, or causing to be published and circulated, advertisements, circulars, folders, letters or any other printed or written matter wherein it is stated that respondent's product **"Tri-Oxyalene"** has been tested and has been approved or recommended by the Government Bureau of Mines in Washington, D. C., or words to that effect.

The Louisville & Nashville R.R., is working steadily in the Irvine-Ravenna yard district, in double tracking and increasing facilities for handling more cars, to render better service to the Hazard field, which has long been above the capacity of the railroad to handle when mines are busy.

The Kentucky King Coal Co., owned by Eastern capital, one of the large mines operating in the Wallins seam on Wallins Creek, adjacent to Henry Ford's Banner Fork Mine, closed down late in March for extensive repairs, which will include a new incline approximately 2,500 ft. long and a new headhouse at the top of the incline.

K. U. Meguire, of the Harlan Coal Co., Louisville, was in Bell and Harlan counties recently looking after his company's interests in that section.

J. H. Martin, of the Kanawha-Knox Coal Co., headquarters in Cincinnati, was visiting Pineville and Middlesboro recently. The company has a large mine on the Cumberland Valley Division of the L. & N. at Ely.

Harlan-Kellioka Coal Co. has increased its capital from $200,000 to $250,000.

The Castro Mining Co., Cary, capital $15,000, has been incorporated by C. L. Gooch, and Frank C. Martin, Pineville, and J. Y. Page, Wallsend.

D. M. Williams Coal Co., Krypton, Capital $25,000, has been formed by D. M. Williams, Pryse, W. B. Napier, Krypton, Wm. Ledyard, Richmond.

MINNESOTA

George A. Tomlinson, Cleveland, large operator of freighters on the Lakes, has wired his Duluth office to take no chances on the strike and to protect his ships thoroughly in the matter of coal supply. The Duluth office will contract for sufficient coal to take care of the ships at the Head-of-the-Lakes.

W. W. Broughton, president of the Pittsburgh Coal Co., was in Duluth recently on a tour of inspection of the company's docks.

Following a battle in Duluth's city council, the **Duluth Central Heating Co.**, has been granted a franchise to operate. The company will take care of the entire central business of the city, and it is expected will render more efficient service than private plants. The project had the approval of coal men and business men generally.

Taking advantage of the lull in operations **The Inland Coal & Dock Co.** has let contracts to build a 500-ft. extension to its dock at Duluth. This will make the total length of the dock 1,970 ft. Storage capacity will be increased by about one-third. R. C. Buck, Inc., of Superior, Wis., has been awarded the contract at a figure which is reported in the neighborhood of $150,000. The extension will be finished about July 1.

MISSOURI

An estimate of the deposits in the Deepwater field shows about 5,000 tons to the acre, or a million tons to the entire field. **The Progress Coal Co.** has obtained title to practically all of these rights.

The Allburn Coal Co. will take over the property of the **Plattsburg-Vibbard Coal Mining Co.**, which was inventoried at $65,000. This property was recently destroyed by fire. The mine is at Vibbard and was sold at public auction for a price understood to be $10,000. Plans are under way to build new top works and reconstruct the mine.

A new drift mine on a 90-acre strip is being opened up near Boonville and the balance of the 231-acre coal bearing area will likely be stripped.

NEW YORK

The First Lake coal to leave Buffalo this year was on the Steamer John P. Rice, which left on April 12, bound for Chicago. The first bituminous coal cargo to arrive at Buffalo was that of the Steamer L. R. Davidson, arriving the same day from Sandusky. The latter coal was for the Donner Steel Co.

The Erie Railroad Co. has many thousand of tons of bituminous coal in its yards at Buffalo, which will be distributed along the lines and to locomotives as needed.

C. E. Tuttle of the Tuttle Coal Corporation, New York City has returned from a brief sojourn at White Sulphur Springs, W. Va.

Fred H. Lohr, a Buffalo retailer, is putting in a 1,000-ton storage plant. **John F. Graham**, a Burt, Niagara County dealer, is installing a 1,200-ton plant. Both will be constructed by the Kon-Wald Engineering Co., Buffalo.

Daniel Anthony who for some time has been general agent for the Lehigh & Wilkes-Barre Coal Co., at 143 Liberty St., New York City, has been elected vice-president and general agent, succeeding to the full title of the late P. B. Heilner, who died about a year ago.

Lewis E. Serenbetz who was for some time district sales manager for Majestic Coal Co., Inc., at 120 Broadway, New York City, has been appointed sales manager for Titan Fuel, Inc., of 32 Broadway. Michael Tuch, president of the Brooklyn Union Coal Co., is the president of the Titan Fuel corporation.

Two new coal companies have taken offices in the newly-completed Lafayette Bldg., Buffalo, **the Theodore Krug Coal & Coke Co.**, with Fred Eckelman as manager, and **the Dowlon Coal & Coke Co.**, James F. Hanlon, treasurer and manager.

A report of the **New York Public Service Commission** as of March 31, shows that the heating and lighting companies of Greater New York, did not neglect to add to their fuel reserves during the last two weeks of that month. Anthracite stocks were 252,104 tons and bituminous coal 126,126, as compared with 228,822 tons of the former and 104,301 tons of soft coal on March 17.

OHIO

Eaton Rhodes & Co., Cincinnati, has published an attractive booklet "Crusader," a story of the Elkhorn, dedicated to John C. C. Mayo, whose activities made possible much of the development of eastern Kentucky.

V. C. Heilner, of the New York office, **Arnold Gerstelle**, of the Philadelphia office, and **W. H. Harmann**, the Michigan representative of Percy Heilner & Son, met recently in the Cincinnati office, where the western situation was gone over. Mr. Heilner and Mr. Gerstelle paid a visit to the Puritan mines at Burch, W. Va., in which Mr. Gerstelle is interested. While in Cincinnati Mr. Heilner looked over the first copies of his book on angling which is being published by Stewart and Kidd. He has taken a lease on Paul Rainey's farm in Africa and expects to go there this summer for fishing and hunting.

West Virginia operators who were in Cincinnati recently were **Will Pritchard**, vice-president of the Long Flame Coal Co. of Stowe, **J. W. Moore**, of the Ivy Branch Coal Co., **C. C. Moore**, of the Laurel Branch Coal Co., and **Mike Roach** of the Logan-Pocahontas Coal Co., all of Charleston, and **H. S. Gay** of the Gay Coal & Coke Co., of Logan.

The Pocahontas-Kanawha Coal Co. has been formed in Dayton, with Bert Shumate as president and L. R. Paul as secretary-treasurer. Mr. Shumate was long with the S. J. Patterson Co., of the Gem City and was for some time its sales manager.

Some important coal mining companies in the No. 8 district with headquarters in Cleveland are taking advantage of the lull in operations caused by the strike to launch needed repairs, improvements and extensions. This work is being done by clerks, mine superintendents, and various office employees and is meeting with no opposition on the part of the strikers. Much of the work is being done with the thought that the strike will be followed by an era of activity in the industry and far-seeing companies are making provision for a larger output. Others are expected to follow the example of those who have started repairs. **The Maher Collieries Co.** has a force of about 50 men at work on its mining properties making improvements and extensions. Sidetracks are being lengthened, tipples repaired and ballasting work done. This company is one of those which is preparing for a large demand for coal. **The Pursglove Coal Mining Co.** also has started to make improvements at its properties. It will increase and improve its screens for preparing the various sizes.

PENNSYLVANIA

Recently, the store and building housing the moving picture show and bowling alleys of the **Hillman Coal & Coke Co.**, at the Jerome Mines, Jerome, Somerset County, were destroyed by fire.

The Bessemer No. 1 mine of the **Republic Iron & Steel Co.**, at Russellton, reached its high mark of production in the month of March. A total of 69,300 tons was hoisted. The mine was opened up 20 years ago.

Officers and directors of a number of the subsidiary companies of **Cosgrove & Co.** held their quarterly meetings in Johnstown recently and all subsidiary officers reported record breaking business for the month of March. The companies represented at the meeting included the **Sanford Coal Co.**, **Ernest Coal Co.**, and the **North Shore Coal Co.** The North Shore company owns and operates large retail yards in Evanston and Chicago.

Four plants in the Indian Creek Valley were rendered idle by a breakdown in the electric generator at the works of the **Sagamore Coal Co.**, near Indian Head. The other plants affected are those of the **Howard Coal Co.**, **the Romney Coal Co.** and the **Oneida Coal Co.** The three get current from the Sagamore company.

March was a record-breaking month for the **Locust Mountain Coal Co.** at the Weston colliery. The total tonnage shipped reached 95,000 and the total tonnage actually mined, 90,032. There were 23,288 mine cars dumped, a daily average of 562. To move this tonnage 2,127 railroad cars were required, which would make a train of fifteen miles long.

A summer course in coal mining will be offered this year by the Co-operative Department of Mining Engineering at **Carnegie Institute of Technology**, Pittsburgh. The course will be from June 26 to July 21, and will be given in co-operation with the United States Bureau of Mines. The primary object will be to prepare miners for the examinations of the Pennsylvania State Department of Mines for positions as fire-bosses and mine foremen. The department offers **two fellowships in mining research, and two in teaching and research**, in co-operation with the Pittsburgh Experiment Station of the United States Bureau of Mines. Fellowships are open to the graduates of universities and technical schools who are properly qualified to undertake research investigations.

The State Employment Bureau, Department of Labor and Industry, in its semi-monthly report on the employment situation in Pennsylvania, gives as the number of miners out of work for the last half of March, 8,500. The bureau's report is made as of April 1.

The Workmen's Compensation Board has dismissed the appeals of the **Hudson Coal Co.**, Scranton, in two cases. In both the findings of fact and the conclusions of law of the referee were affirmed. The cases were those in which Pasquale Trumba, Carbondale, was the claimant, the company appealing from an order of Referee Beemer, District No. 3, modifying a compensation agreement, and Veroniko Machaty, Wilkes-Barre, the company in this case appealing from an award of Referee Lewis, District No. 9.

Removal of 148 bodies from the Polish National cemetary, at Plymouth, has been started. The disinterment of the bodies has been made necessary by mine caves that have spread to such an extent that all of the bodies in the cemetery might at any moment drop down into the underground workings. The work is being done by the **Lehigh & Wilkes-Barre Coal Co.**, over whose mines the cemetery has been located for many years.

A. G. Weary, inspector of mines for the Pennsylvania, has moved his headquarters from Cresson to Greensburg.

UTAH

The Rocky Mountain Coal Co. has been granted permission to sell $500,000 of first mortgage 7 per cent bonds at a discount not to exceed 10 per cent of the par value, provided the company gives one share of common stock for each $4 of the par value of the bonds, but it shall have the privilege of issuing its first mortgage bonds for the total of $1,000,000. A commission of 15 per cent is allowed for the selling

Application to develop power for operation of coal mines in Utah has been made to the Federal Power Commission by James H. Mays and Harry L. Gandy. They ask a preliminary permit to develop power on Huntington Creek in the Manti National Forest, Emery County. The project will consist of a small diversion dam, a short conduit, a power house and a transmission line leading to proposed coal mines nearby. The power will be used in mining coal on a large tract of land leased from the Government.

VIRGINIA

Officials of the Chesapeake & Ohio were here recently to confer with coal shippers relative to the controversy over alleged irregularities in the conduct of the **C. & O. Coal Exchange at Newport News.** Shippers through that exchange have asserted that demurrage charges have been improperly placed, somewhat similar to the claims made by the Lambert's Point Shippers.

WASHINGTON

Andrew A. Corothers, of Ellensburg made final proof on his 40-acre coal entry at the United States land office recently. Mr. Corothers made his entry years ago under the provision of an old law and is allowed to prove up by paying $20 an acre. Under the present law all he could do would be to lease the land from the Government and pay a royalty on all coal mined.

Mines of the **Pacific Coast Coal Co.** produced 61,687 tons of coal last month. The company so far is unaffected by labor troubles of other mining regions.

WEST VIRGINIA

Pending an adjustment of the strike and at a time when mining operations are generally suspended, **Robert Talbott & Co.**, of Fairmont, are installing a new tipple, conveyor and equipment at the Agnes Mine near Lowesville in Monongalia County, at a cost of about $15,000. Although the new conveyor has a wooden frame, it is really of steel construction extending 226 ft. down a hillside to the tipple. The plant will have a capacity of 250 tons an hour when the new equipment is put in use. Bar screens will make it possible to prepare and load 1¼-in., ¾-in., mine run and slack into cars. Under the new arrangement slack and ¾-in. can be loaded simultaneously.

Permission has been given to the **Clayton Young Coal Co.**, at Norwood, near Clarksburg, to operate its small mine in order to furnish fuel for the Pittsburgh Plate Glass Co. This permission was granted because the Plate Glass company is under contract to furnish electric light to Norway.

Taking advantage of the lull in business and operations the **Fort Grand Coal Co.**, which has a large mine on the Indian Creek & Northern R.R. in Northern West Virginia is installing electrical equipment at a cost of approximately $15,000.

Complete electrical equipment is being installed by the Fairmont Electric Service Co. for the plant of the **Rock Island Coal & Coke Co.**, at Meriden. A substation is being erected and this will be equipped with three 150 kw. 22,000 to 2,200 volt transformers, a complete steel tower, switches, lightning arresters and protective apparatus. The company will also install a 300 kw. generator set.

J. C. Sullivan, one of the largest shippers on the Virginian Ry. and who controls certain holdings on the N. & W., left late in March for Texas to inspect his oil acreage which is incorporated under the name of the West Virginia Mexia Corporation. Mr. Sullivan expected to be away during the first half of April.

Brooks Hutchinson, of the Rich Creek Coal Co., of Fairmont, returned to his headquarters about April 1 from a business trip to New York.

It has been necessary to take legal action in the circuit court of Summers County in order to terminate the affairs of the **Hump Mountain Coal Co.**, whose career was beset with difficulties from the very outset. The company expended $150,000 in making its first opening only to strike rock. Then $50,000 was spent in order to penetrate the barrier. That experiment having been unsuccessful the company expended another $75,000 after bonding itself for that amount in driving another opening. Creditors, however, became impatient and pressed for settlement.

ONTARIO

F. A. Fish, head of the F. A. Fish Coal Co., who is looking after the Pittsburgh office of the company, spent the Easter holidays at his home in Toronto.

Coal is still coming in over the international bridge and the pinch as yet is not being seriously felt by the railroads. The railroads at Bridgeburg have made reductions in their staffs, owing to the falling off of traffic.

It is stated that the Grand Trunk has 117,000 tons of soft coal in the Bridgeburg yards, prepared for emergency purposes, and some of this is being loaded for use at other points.

WASHINGTON, D. C.

The bill of Senator Frelinghuysen to establish the coal industry comes up every time the Senate takes up unobjected bills on the calendar, but is always passed over. The bill came up recently when on the suggestion of Senator King, Utah, that it "will take considerable time" it was passed over.

The Dorchester, Mass., Board of Trade has petitioned Congress for the passage of the Luce bill prescribing the quality of anthracite.

J. D. A. Morrow, vice-president of the National Coal Association, on April 13 addressed the Economic Club of Worcester, Mass., on the general economic situation surrounding the coal industry.

The United States Civil Service Commission announces open competitive examinations for junior technologist on May 24, July 5, and August 23. Vacancies in the Bureau of Standards, Department of Commerce, for duty in Washington, D. C., or elsewhere, at $1,200 to $1,500 a year, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from these examinations, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. Appointees whose services are satisfactory may be allowed the increase granted by Congress of $20 a month.

The House Committee on Naval Affairs in reporting to the House the Naval appropriation bill for the year beginning July 1 limits to $16,000,000 the funds which the Navy may use in the purchase of fuel. Last year Congress appropriated $17,500,000 for Naval fuel, and recently appropriated an additional $6,282,685 to meet a deficiency in the fuel requirements of the Navy. The fuel appropriation recommended is $9,000,000 less than the estimates. For fuel for the Marine Corps the committee recommends $850,000, which is $260,000 more than the current year but $34,600 less than the estimates.

In testimony before the Senate Committee on Interstate Commerce, **Daniel Willard**, president of the Baltimore & Ohio, denied charges previously made by Frank J. Warne, statistician for railroad labor unions. He said the B. & O. was not interested through stock ownership or otherwise in any company making commercial shipments of coal from mines tributary to its lines, or for that matter, from anywhere else. He said the B. & O had disposed of such interests 14 years ago.

Traffic News

The I. C. C. has denied the petition of the **Chicago & Alton, the Illinois Central, and the Chicago, Peoria & St. Louis railroads** to increase rates on coal, interstate and intrastate, from mines on these lines, to Peoria and intermediate points.

In the complaint of the **C. N. Dietz Lumber Co.**, an examiner recommends that rates on coal from points in Pennsylvania, West Virginia, and Oklahoma to Iowa, Nebraska, and Wyoming points are not unreasonable, but that the rates from points in Wyoming, Colorado and Illinois to points in Iowa and Nebraska and to Elk Point, S. D., are unreasonable.

An examiner of the I. C. C. has made a tentative report in the case of **Henry W. Somers** vs. the New York, Ontario & Western Ry. Co., et al. Docket No. 13,024, of which the following is the syllabus: "Rates on steam sizes of anthracite, in carloads, from points in the Wyoming field of Pennsylvania to Mechanicville, N. Y., and points taking the same rates, found unreasonable and unduly prejudicial. Reparation awarded."

In the complaint of the **Sligo Iron Store Co.**, in which it had previously held that a shipment of coal from Coketon, W. Va., to Lamar, Col., was overcharged, the commission, on application of the Director General of Railroads, has ordered the case reopened for further argument.

The commission has declined to reopen the complaint of the **Peerless Coal Co.**, of Illinois, in which it decided that the rates on coal from points on the Springfield Terminal Railway to various destinations were not unreasonable.

The I. C. C. has canceled the hearing scheduled for April 22 at St. Louis in the matter of reduced rates on coal from Illinois mines on the Illinois Central to Arkansas points on the St. Louis Southwestern Ry.

The commission has denied the petition of the **Fifth and Ninth Districts Coal Bureau of Illinois** and the **Spring Valley Coal Co.**, for a general investigation into all rates on coal from mines in western Kentucky, Indiana, Illinois, Iowa, Kansas, Missouri, Arkansas, Colorado and Wyoming and from the docks to all destinations in Illinois, Wisconsin, Michigan, Iowa, Minnesota, the Dakotas, Missouri, Kansas, Nebraska and Colorado. The commission says its decision in the Illinois coal cases recently announced will stand.

On petition of the B. & O. the commission has reopened for further argument the case involving routing of coal from Western Maryland R. R. mines to Eastern destinations. The commission had decided that the application of through rates on coal from mines on the Western Maryland to Eastern destinations in connection with the B. & O., restricted to the route via Cumberland, Md., was not justified.

The C. & O. Ry. has put in a new rate to St. Louis from the West Virginia smokeless fields of $3.62, which is a reduction of 66c. per ton on smokeless coals. The new rate on Kanawha is $3.47, also a reduction of 66c.

Association Activities

Canadian Retail Coal Association

The eighteenth annual convention of the association was held at Toronto, April 6 and 7, President J. M. Daly, of London, Ont., occupying the chair. G. W. F. Woodside, of Albany, N. Y., secretary of the New York State Coal Merchants' Association, delivered an address on "The Ideal Association." President Daly spoke strongly in denunciation of public ownership, which he regarded as a curse to any country. Major W. R. Coyle, of Bethlehem, Pa., spoke on "The New Co-operation, or the Partnership between Producer and Distributor." He thought it unjust that Canadians should have to prepay freight from the mines, but the good feeling between the United States and Canada was sufficient to insure the amelioration of any commercial or financial difficulties arising between the two nations. "What we are doing" was the topic of an address by Charles B. F. Staats, of Albany, N. Y., urging co-operation between retailers and operators in solving the problems which confronted the trade. Theirs was not a business in which profits could be increased by an increased turnover as consumption was more or less fixed in volume. Decrease in the cost of operation and in overhead were the only avenues open to the retail merchant by which profits were available. Charles A. Ellwood, vice-president of the New York Coal Merchants' Association, expressed similar views as to the necessity of cost reduction.

The following officers were elected: President, G. F. Rogers, St. Catharines; vice-president, W. H. Smith, Owen Sound; directors, M. F. Gray, Guelph, F. A. Dunlop, Hamilton, and J. F. Lindsay, North Bay.

Obituary

Henry Alexander Laughlin, a director of the Jones & Laughlin Steel Co., died on March 21, at his home, Greylock, in Chestnut Hill, Philadelphia. He was the son of James Laughlin, founder of the steel company. Mr. Laughlin was one of the first to recognize the value of the coal deposits on the Monogahela River and foresaw the advantages to be derived from them by Pittsburgh.

Clarence Seymour, of Warren, R. I., died at his home in that town, April 5. Mr. Seymour formerly conducted a coal and grain business at the Collins-Driscoll wharf in Warren, under the name of Seymour Bros., for a number of years.

James J. Bucklin, well-known coal operator of Brazil, Ind., died at the home of his son, H. E. Bucklin, of Indianapolis, Ind. He was treasurer of the Crawford Coal Co.

Willis Glover Townes, vice-president of Archibald McNeil & Sons Coal Co., Inc., of New York, died recently at Palm Beach, where he had been spending the past few weeks. Mr. Townes was well known in the coal trade and at one time was chairman of the financial committee of the National Democratic Executive Committee. He was a member of several clubs.

Louis F. Fogg, sixty years old, a retired coal and coke operator, died in Uniontown, Pa., recently, following a short illness. He was born in Boston and came to Somerset in 1880.

Robert L. Dixon, member of the firm of Dixon & Bilbrey, Murphysboro, Ill., died recently at his home. He had been connected with the coal business in Illinois for over 36 years and is well-known throughout the district.

Coming Meetings

National Retail Coal Merchants' Association. Fifth annual convention at the Drake Hotel, Chicago, Ill., May 18-20. Executive secretary, Joseph E. O'Toole, South Penn Square, Philadelphia, Pa.

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

Missouri Retail Coal Merchants Association will hold its annual meeting May 16 and 17 at the Planters Hotel, St. Louis, Mo. Secretary, F. A. Parker, Arcade Bldg., St. Louis, Mo.

National Coal Association will hold its annual meeting at Congress Hall, Chicago, May 24 to 25. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham.

The American Wholesale Coal Association will hold its annual convention at Detroit, June 6. Secretary, G. H. Merryweather, Union Fuel Bldg., Chicago, Ill.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 26 and 27 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Fidelity Trust Bldg., Indianapolis, Ind.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at the Stacy-Trent Hotel, Trenton, N. J., June 7 and 8.

Retail Coal Dealers' Association of Texas. Seventeenth annual convention at Greenville, Tex., May 15 and 16. Banquets on both nights will be tendered the association, that on Wednesday night being given by the Greenville Chamber of Commerce and on Thursday by the Wholesale Coal Men. Secretary, C. R. Goldman, Dallas.

COAL AGE

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C. E. LESHER, *Editor*

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If a Commission, What For?

OF COMMISSIONS to be we hear much these days. The stage has been reached where nearly everyone, either publicly or privately, if he is competent to judge, considers that the final settlement of the present strike in the coal industry will come through a "commission." Proposals are being made on every side as to the character of such a commission; its personnel in terms of representatives of the public versus those from the ranks of the contenders is being discussed. Some, such as Mr. Watkins, president of the Pennsylvania Coal & Coke Corporation, advise a strictly public group. On the other extreme is the suggestion of Dr. Garfield, former Fuel Administrator, for a group with but one representative of the government—that is, for the public. The Mine Workers have urged a mixture of these two.

What is more important to consider is what a commission will be called on to do. So far as we know Mr. Watkins is the only coal operator who has publicly expressed his ideas on the subject. Doubtless he has in mind the form and activities of the Roosevelt Anthracite Coal Strike Commission, of which he was a member. He is, therefore, thinking of a commission to settle the immediate controversy. If there must be a commission for this purpose, then a strictly non-partisan one is the proper kind.

In his address at the dinner of the Survey Associates in New York last week Dr. Garfield revived his proposal for a permanent board on which there would be a member of the President's Cabinet and an equal number of coal miners and coal operators. Such a board, he made plain, is to function not for the settlement of this strike but, after it is settled, to prevent recurrences.

If some basis of getting together is not found by the miners and operators before the stocks of coal get so low as to constitute a national emergency, then doubtless there will be a forced assemblage before a tribunal that can have but one purpose: the arbitration of the differences between the two sides. And if a solution is found through recourse to a third party, it is not likely that there will be sufficient popular demand or support for a post-strike continuing board of the advisory type embodied in the Garfield plan.

Popular interest centers in cheaper coal, not in the solution of the intricate problems that affect coal producer and miner. We, therefore, anticipate that of the various suggestions the chances favor a form of emergency board or commission designed solely to bring together the opposite views held by operators and miners. If there is to be any basic change in any of the economic aspects of the coal industry, these reforms must come from within. The Robinson commission—save us from another of that type, and this remark has nothing to do with the personnel—outlined a series of important controversial matters for future consideration and negotiation—the check-off, modification of differentials, etc.—none of which it pretended to adjudicate and all of which the operators and miners subsequently carefully left untouched. There is much of possible advantage in giving thought now to the question of what task this "commission" to be is to face. If it is to reform a basic industry, eliminate intermittency, give every mine worker a guaranteed annual income of $2,000 or more, cheapen coal for the consumer and eliminate the non-union fields, that is one thing. If it is to get the miners back to work in time to refill coal bins for next winter, that is another matter.

Jacking Up the Market

NO ONE is surprised that the price of coal has strengthened since April 1. It is perhaps more a matter of surprise that the market has not been more active. The plain fact of the matter is that the market is today inherently weak. The only purchaser in the market has been the iron and steel industry, which because unguarded by large reserves and dependent on a failing output from non-union mines in the Connellsville region has been required to visit other non-union fields producing high-volatile coal.

Coal is hard to sell—to a consumer. But trading in coal is fairly active, nevertheless. The professional trader—the jobber—is busily buying and selling, and, lacking consumers as purchasers, the trade is trading within itself. The jobber says the price of Pennsylvania bituminous coal is $3 or more per ton, but there can be found producers who still think $2.25@$2.50 is the market. It has been interesting during the past fortnight to watch the effect of this trading on the attitude of mind of the trader and in turn the effect of both on the market itself along the Atlantic seaboard.

Buying and selling for prospective gain is perfectly legitimate and without cause for censure. We offer this comment now because of the interest there may later be in how and why the price of coal ascended. Just now the interest of the public is academic, because the public is not buying coal.

If buying from jobbers and selling to jobbers—if passing coal around—will raise the price only the moderate amount that it has, with no real coal consumer interested, what, one may well ask, will happen if and when consumers do come into the market?

Producers—the substantial, far-sighted ones—are already preparing for such a contingency. Some are ceasing production rather than sell to jobbers, thus seeking to curtail the amount of speculative tonnage available. Others are prepared to adopt heroic measures to break the market should it show signs of getting out of hand; immediately offering, for instance, in such a market a considerable tonnage of free coal.

We have no quarrel with the speculative trader in coal whose sole interest is in commissions. We simply point out that the real interest of the coal industry lies is preventing a runaway market, in curbing speculation and in giving the consumer no cause for such complaints as in 1920 fed the flames of the Calder inquiry.

The Public's Warped Vision

ONE of the charges against bituminous coal mining is that it is overdeveloped. That may be said also of copper and gold mining, farming and sugar growing, and of other industries, but when said of them it is always with pity and never with censure. The public says, however, that coal is a staple, and a staple should not be overdeveloped. Why not? Is it not well to have our staples in abundance, for when so plentifully supplied there is competition and there also is more assurance of supply, barring, of course, strikes of the labor trust. After all, it is better to have the industry overdeveloped, like the flour-mill industry, than underdeveloped like the railroad and housing industries. It is alleged that the public pays for overdevelopment. Was ever a more untruthful statement penned? Surely where there is overdevelopment there is competition, and so long as there is competition prices are low.

Another charge against the industry is that there are too many mine workers. But operators have no way in which to make miners come to the mines except by good treatment and big wages. There is no conscription. No ancient Byzantine or more recent, but long-repealed, Scottish restrictions prevent mine workers or their posterity from leaving their industrial occupation. Nothing keeps them but their pay—figure it daily, weekly or yearly, as you please. Why, then, should the public recompense them for their idle time when their pay, as it is, keeps too many men on the job. If wages were lower, there would be fewer miners.

But it is said: "Why not discharge some of the excess men and give the rest a better chance? Other industries discharge their men when there is no work. Only in mining are they given part time." The public bitterly condemns such "unemployment in employment," but we may ask: Is it better to discharge a man altogether, as is customary in most industries, than to divide the work up among the men whenever it offers, as is customary in coal mining?

The public complains that it has to pay for the miners' idle days. Why does the public do it when it is done in no other industry? Just because some arbitrators happened to hear this argument during a recent controversy and took it into consideration, is that any reason for the public agreeing to pay forever for those idle days? It is not done in any other of our many industries. The public that undertakes to pay is itself to blame and not the operators on whom payment has been imposed.

A further inquiry into this is worth while. In the coal regions where the men are striking against a reduction in their wage many men are going to work on odd jobs, available today and discontinued tomorrow, and are accepting 30 and 35c. per hour. Yet the rate paid by the mines they are leaving was in no case less than 94c. per hour. If industry should compensate a man for his idle time the road builders should be paying not 30c. but $1.30 for every hour worked.

The public is like the costermonger with a hardly driven horse which by some misfortune stumbles and falls by the way, and in doing so is injured. The coster's language is terrifying. He swings the whip unmercifully. He drags on the bit with anger, but after all the horse is more to be pitied than censured. Our industry, like the horse, is truly unfortunate. Its overdevelopment is an affliction, not a fault; so also are its payments based on idle time. The public's representatives in arbitration have conceded a wage which takes into consideration irregular operation, and this the public has to pay. Surely the operator should not be blamed for the fact that the public has judged the mine workers' case differently from all others. The peculiarity of the coal industry is found in the warped psychology of the public.

Policy the Principal Issue

JUST how far apart the bituminous coal operators and miners are was evidenced by the speakers for the respective sides at the dinner of the Survey Associates, Inc., in New York City last Friday night. When Philip Murray, vice-president of the United Mine Workers, said: "It is to the interest of the public, of the union operator and of all mine workers that the coal industry should be completely unionized," he announced the fundamental desire and purpose of his union. Perhaps there are many union operators who, having suffered as keenly as the miners from non-union competition in 1921, will agree with this.

When Mr. Murray outlined the terms on which the union would recall the strikers he stated extremes certainly, but terms that indicate the extent of labor's desire. His proposal is nothing less than a law to be passed by Congress "extending the award of the President's Bituminous Coal Commission of 1920 to *all* operators in the country, both union and non-union." On such terms, he indicated, the miners will return to work until such time as a "national conference could be held and a new agreement as to wages and working conditions negotiated and accepted."

In contrast to this, Mr. Watkins made the suggestion in the debate that followed that the union miners return to work at the Washington wage scale of 1917 and that negotiations proceed from that point.

It is just as obvious that the miners will not willingly recede thus far from their position as that the proposal of Mr. Murray is preposterous—preposterous because (1) the award of the 1920 commission had no application to non-union fields; the operators from those districts, having taken no part in its proceedings, were not bound by its findings, and (2) the Congress of this country can pass no such law.

It is possible now to broadly classify the demands, counter demands and issues before the coal industry. Those on which there is no middle ground—that are not negotiable—involve the check-off and national wage agreements. Compromise here might let the miners retain the check-off, but lose the national wage scale, or the reverse. These issues cannot be settled otherwise, until one side or the other is ready to capitulate.

The negotiable demands—those that might conceivably be argued before a tribunal—principally concern wage rates. A spread of 27 per cent between extremes is not impossible of adjustment. Scale committees are accustomed to ironing out such matters. It is the questions of policy that will hinder the return of peace in the coal fields.

Splicing and Care of Leather, Rubber and Canvas Belts

Oak-Tanned Leather Preferable for Power Transmission—Why Short-Lap Belt Is Recommended—Rosin Glazes and Becomes Useless—Tallow and Cod-Liver Oil Make Good Dressing—Cement, Wire and Rawhide Fastenings

By G. H. Radebaugh
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BELTS are made of various materials, among which the most common are leather, rubber and cotton. Maximum power may be transmitted at minimum expense by paying careful attention to the four following considerations: Quality of material, size of belt, speed in operation, and methods of fastening, splicing or joining of the belt ends.

Oak-tanned leather usually is considered the best material for belting, although many canvas, fabric and rubber belts are used on mine machinery. In order to attain maximum usefulness leather belts must be made from a good grade of material. Uniformity is of first importance—that is, the different sections of which the belt is made should all be of the same grade. Leather belts also should be thoroughly stretched, so that they will not have to be tightened every few days.

The leather for the best grade of belting is taken from the rump portion of the hide along the back of the animal. That part of the hide extending along the spine and for some distance upon either side is firm and close in texture and is strongest and best adapted for use in belts. If the strips are cut too long, the ends will be taken from the neck of the animal, which is inferior stock. A "short-lap" belt is one made entirely from that part of the hide which comes from the back of the animal and the strips are not long enough to include any portion of the neck leather.

Questions To Be Answered When Ordering

In ordering belts, complete specifications should be given, thus enabling the supply house to furnish a belt well adapted to the work that it should perform. Seven essential items listed below should be observed: (1) Give exact length desired—that is, the distance around pulleys. Do not add extra length for lap, as the manufacturer will allow for this. (2) State whether the belt is to be "endless," have square ends or to be lapped. (3) Give the exact width of belt in inches, not width of pulley. (4) State manufacture and trade name of belting desired, if any. (5) Specify either single, double or three-ply. (6) State whether the belt is to be cemented or to be secured with other fastenings. (7) Give kind of service for which the belting is intended.

Whenever practicable, belts should be installed so that the slack side is above and the driving side below the pulleys. If this condition is reversed and the slack side is below, the arc of contact is materially lessened. Belts also should be placed on the pulleys with the hair or grain side next to the pulley face.

Getting the most out of a machine consists largely in providing it with sufficient power. On belt-driven machines the belt often—in fact, almost always—is the limiting factor. If this is not kept in proper condition, especially as regards tension, slipping will result, power to obtain maximum results will be lacking, and in addition the belt will wear out quickly. A belt of any size and length is a costly item, and is worth systematic care.

Rosin or resinous mixtures should never be used to prevent belts from slipping. They will cause temporary adhesion, but the belt soon becomes glazed and slips more than before rosin was applied. Lubricating oils should not be permitted to drop on belts. If a belt has become saturated with oil it should be scraped off, after which the belt may be packed in dry sawdust or some other absorbent material for three or four days. When the belt becomes dry, all surface dirt should first be removed before applying a dressing. This usually can be done by cleaning the belt with a cloth dampened with gasoline. If necessary a metal or wooden scraper may be used.

A good dressing for leather belts is made by mixing two parts by weight of beef tallow with one part of cod-liver oil. Melt the tallow and allow it to cool until the finger can be inserted without discomfort, then add the cod-liver oil and stir until cooled. Apply this mixture to the driving side of the belt.

Rubber Belts Resist Moisture and Stretching

Rubber belts are used in places exposed to the weather or the action of steam, as they do not absorb moisture or stretch as easily as leather when subjected to like conditions. The quality of rubber belting depends on the mixture or compounding of the rubber employed. There are, in general, two kinds of rubber mixtures; one composed entirely of new rubber and the other containing some, if not all, reworked rubber or material reclaimed from discarded articles, such as rubber shoes.

The weight of the cotton duck entering belt construction is an important consideration. High-grade belts contain what is known as a 32-oz. duck. If the proper weight of duck is used, a three- or four-ply rubber belt is equal in strength to a single leather belt, a five- or six-ply rubber belt is equal to a double leather belt, and

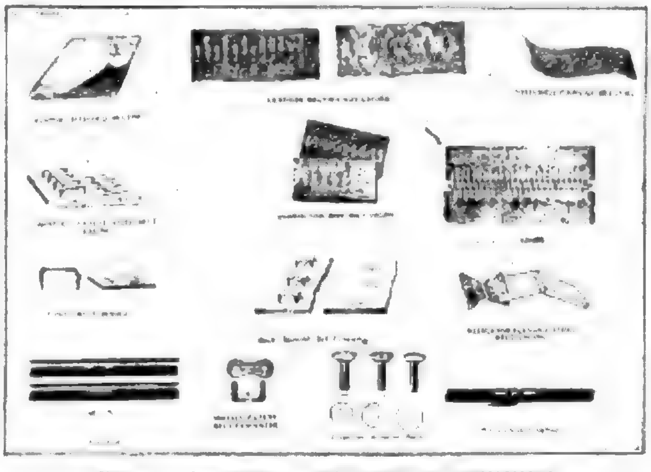


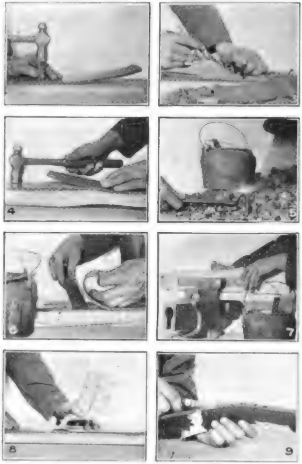
FIG. 1. LACINGS AND BELT FASTENERS

Belt may fastened either by lacings of leather or by various metal devices. The latter may be wire hooks, copper rivets and steel couplings, and one form interposes a hinge between the ends of the belt thus joined.

a seven- or eight-ply rubber belt is equal to a triple leather belt.

Caution should be used in arranging pulleys and shafting in belt installations in order to obtain full power and full service. The diameter of pulleys should be large, for a belt stretches on the outer or convex side while on the inner or concave side it is compressed, and these actions are more marked where a pulley of small diameter is used.

Rubber belts, before being adjusted to the pulleys, should be cut shorter than the distance around the pulleys by ⅛ to ¼ in. for every foot of length when measured with tape or string. With narrow belts the two ends should be butted together, two rows of holes made in each, and the belt laced through them. In addition a wide belt should have a thin piece of rubber or leather sewed onto it to strengthen the joint.



FIGS. 2-9. METHODS OF MAKING A CEMENT JOINT

Fig. 2 shows belt being fastened to board; Fig. 3, belt being planed to a feather edge with wood plane; Fig. 4, paper being placed between belt and board; Fig. 5, glue being heated on forge; Fig. 6, glue being applied to belt; Fig. 7, joint being clamped by a vise; Fig. 8, paper being torn free from belt; Fig. 9, edges of belt being cleaned with a knife.

The seam of a belt should always be placed on the outside and not next to the pulleys. In case a belt of this kind slips, which seldom happens, it is well to coat the side next to the pulleys lightly with boiled linseed oil. Grease and all animal oils are injurious to rubber; hence special care should be taken to protect the edges from such substances, as they cause decomposition.

A dressing for rubber belts may be made from equal parts of red lead, black lead, French yellow and litharge, mixed with boiled linseed oil, with enough Japan added to cause quick drying.

Canvas stitched belting is made of several laps or plies of cotton duck sewed lengthwise and treated thereafter with a compound made principally of linseed oil. This oil saturates the cotton duck, which is thus protected from dampness. Such a belt is not easily injured by heat, cold, gas, steam or acid fumes. Canvas stitched belting often is used where the material coming in contact with it or the surrounding atmosphere would ruin an ordinary leather, cotton or rubber belt. It is particularly applicable to conveying service when the material to be handled will not cut the cotton fiber. Rubber-belt dressing may be used on a canvas belt.

One of the common methods followed in determining the length of a belt is to measure the distance around pulleys with a steel tape, and then when measuring the belt, shorten this distance somewhat to allow for tightness. Another simple rule which can be used with fair accuracy when the pulley diameters are nearly equal and where the above method is not readily applicable is as follows: Add the diameters of the two pulleys, divide the sum by 2 and multiply the quotient by 3, then add to the product twice the distance between the centers of the shafts. Expressing this rule as a formula in which D = diameter of large pulley, d = diameter of the small pulley, C = the distance from center to center of shafts and L = the desired belt length, we have:

$$L = \left(\frac{D+d}{2}\right)\frac{22}{7} + 2C$$

Systematic inspection of belts will prevent much loss of time. As a rule all belts should be overhauled every six months.

CEMENT SPLICE BETTER THAN LACE OR RIVET

The best fastening for a belt is the cement splice. This is far superior to any form of lacing, belt hooks, riveting or any other method of joining together the belt ends. Such a joint is easily applied to leather and rubber belts, but to make a good cement splice in a canvas belt requires more time and demands more apparatus than usually is at hand.

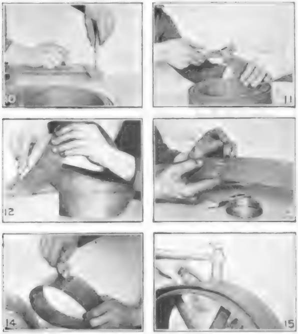
The different kinds of lacings and belt fasteners shown in Fig. 1 give an idea of the many varieties now on the market. Good judgment should be exercised when using fasteners, for a large fastener employed on a small belt cuts it to such a degree as to make it useless.

The following preparation may be used for cementing leather belts: Place equal parts of glue and isinglass (gelatine) in a glue pot, add enough water to cover the two ingredients and let them soak for ten hours. Then bring the mixture to the boiling point and add pure tannin until the mixture appears like the white of an egg. Apply the cement while warm. For rubber belts use sixteen parts of India rubber, two parts calkers' pitch and one part linseed oil. These ingredients should be melted together and used while hot. This cement also can be applied to leather.

The lengths of laps that may be used advantageously in cementing belts are as follows:

Width of belt....	1 in.	2 in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.
Length of lap....	5 in.	5 in.	6 in.	7 in.	7 in.	8 in.	8 in.	9 in.

It must be understood that with cemented belts (if no adjustment is provided for increasing the distance



FIGS. 10-15. LACING A BELT WITH WIRE

Fig. 10, using a square for cutting off ends of belt. Fig. 11. punching belt with hand punch; small holes suffice. Fig. 12. making grooves in which to sink wire from hole to edge of belt. Fig. 13, lacing belt with wire starting on pulley side. Fig. 14. using pliers to pull the lacings tight after each lace. Fig. 15. fastening the end of the wire; this end must never project.

between centers) the problem of belt tension becomes difficult. It then becomes necessary to reglue the belt every time the tension is adjusted. This puts the driven machine out of production during the time the belt is being rejointed.

In gluing a belt the first operation is to fasten it to a board. This can be done with two small nails, as shown in Fig. 2. The next step is making the lap. This is accomplished by using the wood plane. The lap should be brought to a feather edge, as shown in Fig. 3. The two ends should next be fitted together, the amount of leather removed being checked up. The lapped joint, after cementing, should be no thicker than the remainder of the belt.

MEANS TAKEN TO OBTAIN WELL-CEMENTED JOINT

When clamping the joint to place a piece of paper should be placed between the board and belt as shown in Fig. 4, the two laps matched together, and placed in positive position with small nails. The belt should be lined up with the edge of the board. This is done in order that it may be kept straight.

The glue pot or double boiling pan should be heated on the forge fire or elsewhere, as shown in Fig. 5. It is best never to bring the glue to a high heat, and to this end water should always be kept around the glue pot proper. Rapid heating should be avoided, as there is danger of scorching.

The glue is next applied to the belt laps, as shown in Fig. 6, by means of a paddle or brush. This operation should be performed rapidly, so that the laps may be brought together before the glue sets. After the glue is applied the laps may be brought together, a piece of paper being put on top of the belt before the upper clamping board is applied. When the top board is put in place, the belt ends should be forced together by using the vise, as shown in Fig. 7, or by means of woodworkers' clamps.

The belt should be left in the clamps over night if possible; if that cannot be arranged, the clamps should be kept in place for from four to eight hours. After removing the clamps and the upper board the paper may be torn off as in Fig. 8. The nails may then be withdrawn and the belt removed from the bottom board. It may then be cleaned up, and all paper and particles of glue removed. The edges should be cleaned with care, as shown in Fig. 9, after which the belt is ready to be placed on the pulleys.

In lacing a belt with wire the first operation is to square the ends, as shown in Fig. 10. This should not be done by eye; the steel square should be used as shown in this view. Working on a block of wood makes it easy to hold the belt and the square with one hand, leaving the other free to wield the knife.

Holes for the lacing should not be punched farther from the end of the belt than the belt thickness. They should be punched directly opposite each other and in the proportion of nine holes to every 4 in. of belt width. The hand punch, as shown in Fig. 11, should be used and only small holes punched, because the wire lace does not require large ones.

MAKE A GROOVE ON BELT AND EMBED THE LACES

On the side of the belt next to the pulley it is good practice to cut a small shallow groove from the hole to the end of the belt. This may be done by using a grooving tool as shown in Fig. 12. Sinking the lacing in this manner permits the joint to run more smoothly over the pulley and gives a much neater job.

After the holes have been punched in each end of the belt, the ends are brought together. A piece of lacing wire (soft copper wire or regular metallic belt lacing) seven times the width of the belt for single and nine times the width for double belts is cut off. Lacing is started on the pulley side and in the center holes, as shown in Fig. 13, and is conducted in both directions.

In finishing a laced joint the ends of the wire should be securely fastened. The first step is to lace back along the belt as shown in this view. The wire should

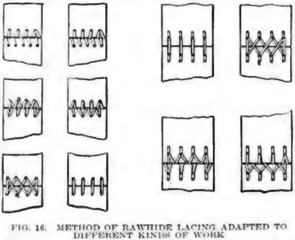
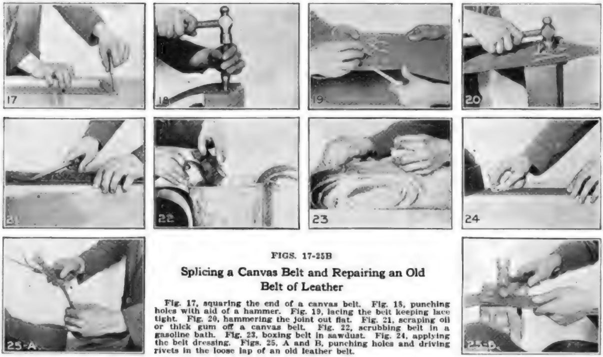


FIG. 16. METHOD OF RAWHIDE LACING ADAPTED TO DIFFERENT KINDS OF WORK

Left Pairs: (1) Single-hole, single-hinge lace for small high-speed pulleys transmitting light power. (2) Single-hole double-hinge lace for medium and heavy single belts; high speed and heavy power. (3) Single-hole double straight lace for light or medium-weight double belts; pulleys over 16-in. diameter, light power. Right Pairs: (1) Double-hole, double-straight lace for light, medium or heavy-grade double belts, for pulleys over 10 in. diameter; heavy power. (2) Double-hole double-hinge lace for medium, heavy-weight double belts running on pulleys 10 in. and under, with high speed, heavy power.



FIGS. 17-25B

Splicing a Canvas Belt and Repairing an Old Belt of Leather

Fig. 17, squaring the end of a canvas belt. Fig. 18, punching holes with aid of a hammer. Fig. 19, lacing the belt keeping lace tight. Fig. 20, hammering the joint out flat. Fig. 21, scraping oil or thick gum off a canvas belt. Fig. 22, scrubbing belt in a gasoline bath. Fig. 23, boxing belt in sawdust. Fig. 24, applying the belt dressing. Figs. 25, A and B, punching holes and driving rivets in the loose lap of an old leather belt.

always be pulled up tight with the pliers after each lace, as shown in Fig. 14.

The end of the wire may be fastened as shown in Fig. 15. The wire ends should never be allowed to project from the belt, as by this means it may be injured. The wire may be so formed that its end can be driven into the belt. This is shown clearly in the figure to which reference has just been made.

When making a rawhide-laced joint in a canvas or rubber belt the ends should be cut perfectly square and two rows of staggered holes punched exactly opposite each other in the two ends. Lacing should begin in the center of the belt and the rawhide thongs should not be crossed on the side of the belt that runs next the pulley.

The single-hole, single-hinge lace of Fig. 16 No. 1 is intended for light single belts running at high speed over small pulleys 6 in. in diameter or under and transmitting light power. The single-hole, double-hinge lace shown in No. 2 of the same figure is for medium and heavy single belts running at high speed and transmitting heavy power. No. 3, or the single-hole, double straight lace, is for light and medium-weight double belts running over large pulleys 16 in. in diameter or more, transmitting light power. The No. 4, or double-hole, double straight lacing, is for light, medium and heavy-grade double belts running over large pulleys 10 in. in diameter or more, transmitting heavy power. The No. 5, or double-hole, double-hinge lace, is intended for medium- and heavy-grade single and light-weight double belts running on small pulleys, 10 in. in diameter and under, at high speed, transmitting heavy power.

In squaring the end of a canvas belt, a straight board should be employed along one edge and the steel square used upon it, as shown in Fig. 17. This affords a much better surface to work to and assures that the belt can be cut square.

In punching the lace holes the type of lacing to be used is first decided upon—that is, whether single or double—after which the belt is placed on the end of a block and the holes punched as shown in Fig. 18. In making a laced joint on a large belt it is advantageous to have someone hold the belt. With this help a more even job can be performed. Each time it is passed through a hole the lace should be pulled tight as shown in Fig. 19. When the joint is finished, hammering it as shown in Fig. 20 will smooth out the lacing and make it run more evenly over the pulley.

When a belt becomes saturated with oil or a thick gum appears, the dirt, oil and gum should be removed, by scraping, as shown in Fig. 21. After the belt has been cleaned in this manner it should be placed in a gasoline bath and scrubbed well with a good stiff brush, as illustrated in Fig. 22. That it be cleansed as thoroughly as possible in this operation is highly important for its successful permanent cleaning.

The belt may now be placed in a box that is filled with sawdust, as shown in Fig. 23, and allowed to remain for three or four days. When it becomes dry it can be removed and wiped off with cloth or a brush.

A good belt dressing may now be applied as shown in Fig. 24. This should be well rubbed in. The belt is now ready to be returned to service.

Figs. 25 *A* and *B* give an idea of the necessary operations performed when punching holes for and driving rivets in a loose lap. This sometimes becomes necessary with old leather belts.

THE PITTSBURGH (PA.) EXPERIMENT STATION of the U. S. Bureau of Mines is continuing laboratory experiments on coal ash fusibility, oxidizing and reducing atmospheres by the micropyrometer method, and comparing the results with those of the gas furnace. By using a reducing atmosphere in the micropyrometer furnace fairly good checks were obtained on ash, the average in the micropyrometer method being about 150 deg. F. lower. While the micropyrometer method cannot be used as an alternate method if close checks are required, it can no doubt be used as a rapid method for determining the fusibility of coal ash. The results of this investigation are now being tabulated.

How to Keep Mine Locomotives in Operating Condition

Waste Should Be Turned Daily—Beware of Glazing of Waste—Watch Split Gears to See They Are Not Loose—Care of Wheels and Locomotive Frames—Best to Remove All Brake Shoes at One Time

AMPLE strength to withstand the most severe service is a primary requisite in an electric locomotive for mine use. This applies especially to such structural parts as frames and bumpers. It is also applicable, however, to much of the other equipment, such as the brake rig, which is subject to rough handling and severe stresses. This, accordingly, must be simple in design, with the various members, pins and bolts of ample size.

Though a mine locomotive is necessarily subjected to a certain amount of rough usage, reasonable care and attention will greatly prolong the life of various parts subject to wear. Nothing is more important, for example, than that proper attention be given to lubrication. A high grade of wool waste should be used in the journal boxes and care should be taken to see that it is in contact with the journal. Each morning before starting out, the waste should be turned over with a hook, all lids and covers kept closed and the journal box free from dirt and dust.

To illustrate the result of neglect in these details a case may be cited where a locomotive broke an axle which on examination was found to have a diameter nearest the wheel, where failure occurred, of only about 1½ in. An excess of sand had accumulated in the journal box, and the waste was extremely gritty and dirty, resulting in severe cutting. Such neglect is indeed poor economy.

CLEAN OFF OUTSIDE BEFORE EXPOSING MACHINERY

Before inspecting a locomotive it should be thoroughly cleaned, and all mud, coal dust, etc., that may have been accumulated on any of the parts removed. This applies particularly to motor covers, oil cups, journal-box lids and the like.

Brake equipment should be inspected daily All brake shoes should be in good shape for the day's run, and slack at the dead lever should be taken up so that when the brakes are "on," the brake-shaft thread will project at least one inch beyond the nut in the brake beam. The threads of the shaft and the nut should be examined to see whether they are worn and in danger of stripping. All levers and pins should be kept free from mine dirt, as this will frequently clog the mechanism sufficiently to cause uneven wear of the brake shoes.

Drive-wheel boxes should be inspected daily. Only good wool waste, thoroughly saturated with oil, should be used for packing, and this should be replaced as soon as it becomes glazed or dirty and therefore incapable of absorbing oil. Journal brasses should be replaced before they are worn thin enough to split, and journal springs should be examined, and if broken should be at once replaced. It is well to oil daily between the wheel hub and journal box, as well as between the pedestal wearing plate and its box.

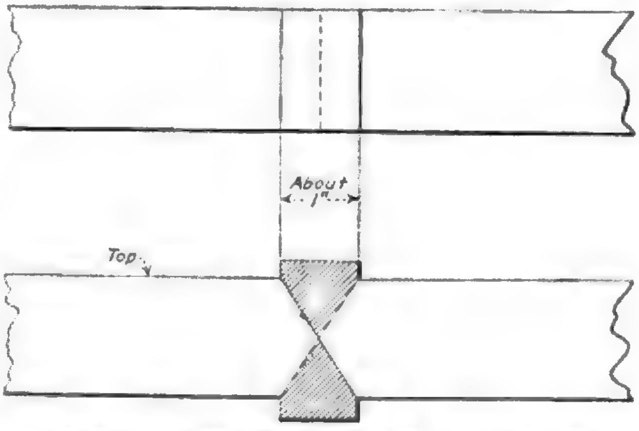
When it becomes necessary to remove a journal box, the method of procedure will depend upon whether the frames are inside or outside the wheels and also upon the design of the various parts. In outside-frame locomotives of the latest type it is only necessary, when removing a box, to jack up the frame enough to relieve the spring pressure, take down the guides that hold the box in place, and draw the box outward from the axle.

When it is necessary to remove a journal brass from such a locomotive, the frame is first jacked up until a clearance of ¼ in. is obtained between the spring and its seat on the frame. The box is then raised against the spring by placing a wedge between it and the pedestal cap. This releases the brass, which can then be withdrawn.

On locomotives having inside frames it is necessary, in order to remove a box, to take down the pedestal caps and then jack up the locomotive until the lower edge of the frame clears the top of the journal box. The oil cellar is next removed by driving out the cotter pins that secure it to the box, whereupon the box may be turned upside down on the axle, thus permitting it to drop off. It is generally necessary to follow this procedure when removing a brass, as the motor frame or gear case is too close to the box to permit drawing the brass out when the spring pressure is released. Ordinarily brasses or boxes will not require renewal except when the wheels are replaced, so that both jobs can be performed simultaneously.

The pinions on both the motor and countershaft should be inspected weekly and replaced whenever the teeth become badly worn across the top. Care should be taken to draw the new pinions tight upon both these shafts. If they are straight-bored they should be pressed on; if taper-bored they should be boiled for about one-half hour in water to clean off the grit and oil, then applied to the axle and drawn up to place with the shaft nut.

The upper halves of the gear cases should be removed at regular intervals. When split gears are used an inspection should be made of the point where the two halves of the gear join, to see that all bolts are drawn tight. A loose gear will ruin the axle or counter-



METHOD OF WELDING CRACK IN A BAR FRAME

A V-shaped cut is made on the upper side of the bar to meet one in the lower side. The two meet in the center. The V-shaped pieces of wrought iron or steel can then be inserted and welded under the hammer or the cut can be filled with metal with the aid of either an electric welder or an oxyacetylene torch.

shaft and probably will cause damage to the related parts of the equipment if allowed to run. Such a gear may also be the cause of a stripped pinion or a broken motor suspension.

If the pinions are not wearing evenly across the face, one or the other of the following conditions is the cause: (1) Loose axle caps (bolts need tightening), (2) uneven or excessive wear on the countershaft bearings, (3) motor is out of alignment, or (4) axle bearings need replacement, because of excessive wear. The countershaft and axle bearings should be renewed when they have worn down the equivalent of $\frac{1}{16}$ in. on a side.

A liberal quantity of lubricant, either a good gear grease or a heavy oil, should be kept in the gear case. It should be borne in mind, however, that an excess of lubricant means waste. It is good practice always to run with gear cases in place, because if they are removed, something may get into the mesh and damage the gears. It is inevitable that sand and grit will get between the gears and pinions, causing increased wear and shorter life if the gear cases are not in place and the proper lubricant cannot be applied. If, however, the cases are loose or broken, it is better to remove them entirely until time can be found for their replacement. This should be done as soon as possible.

The wheels used on electric mining locomotives are of three kinds—cast iron with chilled tread, rolled steel, or steel tired with a cast-iron center. A cast-iron wheel should be replaced when the chilled tread is worn through. When this has occurred the locomotive usually begins to damage the track at switches, frogs and curves. Steel-tired and rolled-steel wheels can be turned down in a lathe when the tread becomes worn or grooved. This should be done before the wheels begin to damage the track.

When a steel tire becomes worn to the limit of safety, it must be removed and replaced by a new one. This is preferably done by heating the tire with a gas or oil burner placed around the tread, until it expands sufficiently to drop off the center. If no facilities are available for doing this, the following method sometimes can be used: Remove the axle, with the wheels mounted upon it, from the locomotive, and place it on end on the ground. Pack clay, mixed with a sufficient quantity of water to keep it damp, between the spokes of the wheel, and build a wood fire around the tire. When the tire has become sufficiently heated, it will drop off.

MAY BE REMOVED BY DRILLING AND CHIPPING

Another method, which sometimes can be used, is to drill the tire across the tread and flange for its full depth, and chip out the drillholes. The tire will then spring open and drop from the center.*

When applying new tires the face of the wheel hub which bears against the driving box should be carefully examined. If it is badly worn, either a new center should be substituted or the old one turned up in a lathe, and a steel-plate shim thick enough to give a lateral motion not exceeding $\frac{1}{16}$ in. between the hub and the box applied. If the box is badly worn, it also should be replaced at this time.

The frames of electric mine locomotives, if of plate or cast steel, often can be repaired, even though they have been seriously bent or damaged in a wreck. If bent out of shape, they can be heated to a cherry red in a wood fire, and then straightened on a flat surface or forced back to true with clamps or jacks. If a section breaks out it can be welded into place either in the blacksmith shop or by using the electric or oxyacetylene welding process.

In welding a crack in a bar frame, a V-shaped section should be cut out the full width of the bar on the upper side as well as a similar section on the under side, so shaped that the two meet at the center as shown in the accompanying sketch. Two V-shaped pieces of wrought iron or steel can then be inserted and smith-welded into place. If an electric welder or an oxyacetylene torch are available the frame should be cut out in the same manner, but the V-shaped cut should then be filled with welding metal.

After making repairs to frames, special care should be taken when applying such parts as bumpers and foot plates. These members must be accurately fitted to the frames and held in place by turned bolts having a driving fit in reamed holes. The frames should be trammed both crosswise and diagonally for squareness in order to insure even wear on journal brasses and proper lateral clearance as well as to avoid uneven stresses.

The Master Car Builders' type of brake shoe is the preferable form for use on mine locomotives. This shoe is secured to its head by means of a tapered spring key. The head is preferably attached to the brake lever by a pin and cotter.

In removing a brake shoe it is first necessary to disconnect the spreader bar between the lower extremities of the brake levers at one end, thus allowing the levers to hang free from the wheels. Next the pin fastening the brake shoe head to the lever can be withdrawn, allowing the shoe and head to be taken down together. The shoe then can be removed by driving out the spring key, and a new shoe fitted to the head, care being taken that contact is made between the lugs provided for this purpose. If the brake lever can be swung far enough from the wheel, the shoe can be removed by simply driving out the spring key, without detaching the head from the lever.

REPLACE ALL FOUR BRAKE SHOES AT ONE TIME

Usually it is preferable to replace all four brake shoes at one time. If however, only one or two require renewal, the new shoes should be applied to one pair of wheels, leaving the old ones on the other pair. This distributes the slack equally on each side and gives a more even braking effect. If the shoes are uniform in quality they as a rule will require replacement in pairs. Attention should be given to taking up the slack in the brake rigging as the shoes become thinner, for this keeps the wear even at the top and bottom.

It is important that the sanding equipment of electric mining locomotives be given special attention. These machines frequently have to work on wet and slippery rails and, while sand should be used only when necessary, it is essential that a supply be available at all times. Only a good grade of sharp, dry sand, preferably screened, should be employed. Sand-box valves should be kept in such condition that they will close tight; if they fail to do so bent arms or rods in the sand-box rigging probably are the cause. If in service the delivery spouts are knocked out of alignment, they should be replaced or readjusted so as to deliver sand to the rails immediately in front of the wheels.

When gathering locomotives equipped with either conductor-cable or traction-rope reels are used, the reel and all parts pertaining thereto should be inspected daily.

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*A tire sometimes may be sawed in two or stretched with a cold chisel the edge of which is placed across the tread.—EDITOR.

Conductor-cable reels can be divided into two classes: Those mechanically driven from the locomotive running gear and those that are motor driven. The guide tongue of the former should be inspected to see that it is set so that the position of the guide insulator corresponds with that of the cable on the drum. When repairs to the cable are necessary, care should be taken to make a good compact splice which with careful taping will not increase the size of the cable at the splice, thus preventing any tendency toward dragging on the guide insulator. All worn places in the cable insulation should be promptly taped.

The set screws that hold the cable in the collector and the collector fingers must be kept tight. These latter should be regularly inspected and the contact surface kept smooth and clean.

Careful attention should be given to the lubrication of the friction clutch, if such a clutch be used; also to the bearing of the guide shaft, to the guide tongue and guide bars. A light grease should occasionally be applied to the threads of the guide shaft.

The above directions apply with equal force to motor-driven conductor-cable reels also, except that, as the spooling device is gear-driven instead of chain-driven, no clutch is required. A moderate amount of grease should be placed on the gears operating both the reel and the spooling device. To prevent injury to the cable the block through which the cable passes should be changed before it becomes grooved. Attention to this detail will lengthen the life of the insulation on the cable and prevent injury to the reel drum caused by grounds and short-circuits.

All bearings should be inspected daily and oiled when necessary. The quantity of oil required will depend upon the service performed and must be determined by experience. When oiling the armature bearings, care should be taken that no oil be permitted to enter the interior of the motor, as this will cause dust and dirt to collect, which may cause a ground or short-circuit. All bolts should be examined carefully at regular intervals, to see that they are tight.

Equal attention should be bestowed upon traction-rope reels. The drumshaft bearings should be oiled daily, and grease should be applied to the bevel gear and pinion. It is wise to clean the wire rope once a week, especially when the reel is operated in wet or muddy places. After cleaning, the cable should be drawn through a piece of canvas well saturated with oil. This will preserve it from rust and also make it easier to handle. Every precaution should be taken to keep the cable out of the sulphur water frequently found in mines, for this has a particularly destructive effect upon iron and steel.

It is well to keep the following parts in stock for maintenance purposes, the quantity of each depending upon the number of locomotives in use: Brake shoes, brake shaft with brake-beam jaw or nut, journal bearings, wheels and axles assembled, ready for application, driving boxes complete with gibs.

Oil and grease always are cheaper than castings, forgings and brasses, yet no locomotive is indestructible nor can it be made to last indefinitely. However, reasonable care, forethought and intelligence bestowed upon these machines will pay big dividends as a result of better, longer, more reliable and more efficient service.

Anthracite Carefully Inspected for Slate, Bone or Faulty Sizing Before Shipping

By Dever C. Ashmead*
Kingston, Pa.

Each railroad car before it is filled with coal at an anthracite colliery is inspected and, if necessary, carefully cleaned out. This is done to make sure that it shall contain no foreign material, such as brickbats, rock, scrap iron and the like. All openings not closable by other means are made tight either by boarding up or, if they are small, by filling or calking with straw, hay or excelsior. This insures against leakage of coal while en route to the purchaser.

The description that follows relates specifically to the practice followed by the Hudson Coal Co. While the procedure of other anthracite producers doubtless varies in detail from that about to be described it is in the main quite similar.

When fully prepared for loading the car is dropped or run down from the empty storage tracks to the "empty" scales above the breaker or washery. The empty and loaded scales, or those installed above and below the loading point, are of identical construction. They are long enough to accommodate a 50-ft. car and have a capacity of 300,000 lb. The platform or operative track portion of these scales consists of the rails themselves. These are mounted upon inverted channel irons that serve to protect the mechanism below from rain, snow, spilled coal or other material. Elimination of the ordinary platform renders it impossible for accumulations of such material to throw the scales out of balance.

WEIGHMASTER PUNCHING TICKET ON SELF-REGISTERING SCALE BEAM

Every car is weighed before being loaded and is weighed again after loading. Cars may be as much as 2,000 lb. off the weight stenciled on the side. The weighing of the empty car checks such errors.

Tare weights of all cars to be loaded are taken on the empty scale. It is seldom that these weights agree with those stenciled on the cars. Sometimes these stenciled markings are above and sometimes below the actual weights. In a few cases these variations amount to as much as 2,000 lb.

After the empty car has been weighed it is run under the coal chute and filled. As soon as this is accomplished it is allowed to gravitate to the inspection house, where the quality of its contents is tested. From each car a 50-lb. sample is taken, the points from which it is collected being shown in one of the accompanying illustrations by means of stakes set in the top of the

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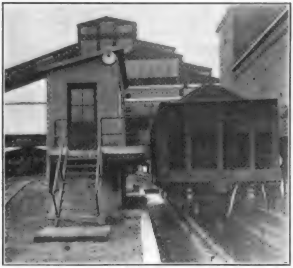
*Anthracite Editor, *Coal Age*.

coal. In collecting the sample the surface of the load is shoveled away, after which a small amount of the contents of the car is taken for testing, this being deposited in a large steel bucket or pail, as shown.

The bucket is then placed on a balance and its contents adjusted either up or down until it amounts to exactly 50 lb. This is done for convenience and uniformity only. A jet of live steam is next passed through the contents of the bucket. When the coal is spread out after this treatment it dries quickly and slate or other impurity becomes readily distinguishable.

After steaming, the contents of the bucket is dumped onto a small table, where it is picked over piece by piece. The above statement applies to the pea size and larger. Those sizes smaller than pea are tested by flotation, the impurities being thus separated according to their specific gravities. In picking, the rock is placed in one container, the bone in another and the good coal returned to the sample bucket. These constituents are then weighed and the percentage of impurity calculated.



CAR OF BUCKWHEAT ON WEIGH SCALE

The platform is constructed so that it cannot be loaded down with coal bumped from the cars. When the platform is thus loaded, the coal resting on it is weighed again and again till the weighman bethinks himself to sweep it off or adjust the balance. By eliminating the platform, this error and that from the wetting and drying of the plank are avoided.

NINE STAKES SHOW WHERE SAMPLES ARE TO BE TAKEN

This gives a good cross-section of the load as the car is gradually filled from one end to the other. For this reason the top is a good index of what may be found beneath it.

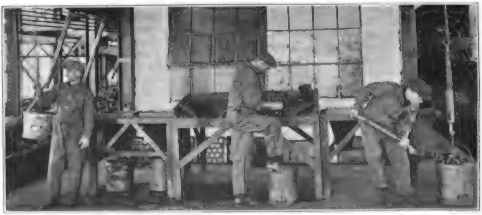
In addition to the above test chestnut coal is screened in order to determine the amount of oversize and undersize that this grade contains. If the slate contained exceeds 6 per cent, the particular carload from which the sample was taken is condemned and sent back through the preparator for re-treatment. The critical quantities of impurity for the other domestic sizes are: Pea, 10 per cent slate; stove, 4 per cent slate and 4 per cent bone, and egg, 2 per cent slate and 4 per cent bone. Fifteen pieces of slate and bone coal on the top of a car of grate coal will result in its condemnation.

ONE CAR IN TEN IS RETURNED TO BREAKER

Of all the cars loaded by the Hudson company during the month of March last 9.45 per cent were condemned on inspection and had to be re-treated. After passing the inspectors the car goes to the loaded scale, where its gross weight is taken. The scale mechanism is such that reading the weight on the beam and recording it manually is unnecessary, the correct weights being stamped directly on a piece of paper. This minimizes the liability to error.

This gross weighing is the last operation through which the coal passes before being turned over to the railroad company for transportation to the customer. Administration of the treatment above described assures the purchaser that the fuel he buys will be standard in quality, that the weight is correct and that no coal will be lost in transit through holes or leaks in the car body. Of course losses may occur, but they will be the result of pilfering, accident or other causes beyond the producer's control.

A STUDY OF COAL-MINE atmospheres in Illinois and Indiana is being conducted by engineers of the U. S. Bureau of Mines station at Vincennes, Ind.



Weighing and Picking Samples

Egg, pea and chestnut being sampled prior to shipment to market. Note sample screens in the rear. This is not a mere "beau geste." Almost 10 per cent of the cars are sent back to the breaker for re-treatment. The condemned - coal conveyor is a very active member of every anthracite preparator.

Providing Maneuvering Facilities and Longwall Face Needed for Mechanical Coal Loading

Mine Layouts Adapted to Hand-Loading Methods Are Not Suited to Machine Loading—Plan Embodies Straightway Cuts Along Which Loading Machines Travel, Delivering Coal to Cars in Full Trips Wherever Possible

BY CHARLES GOTTSCHALK
Boonville, Ind.

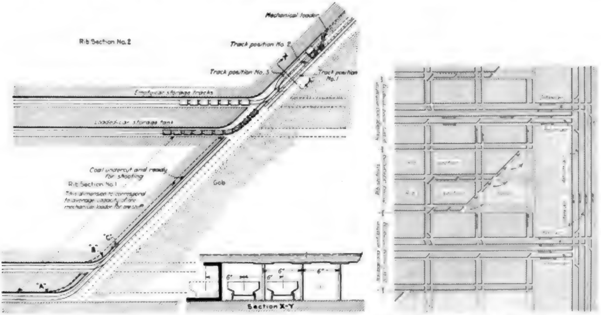
DURING recent months mining periodicals have published many suggestions and partial layouts for the expeditious loading of coal by machinery. The plan and suggestions offered herewith are not recommended as being suitable to every condition, but it is thought that they may apply to many of those mines where pillar drawing has already been in progress and where, with machine mining and hand loading, the pillar coal thus far mined has been completely recovered; also in those properties that may have been using the systems mentioned, but because of existing labor conditions, or for other reasons, real and imaginary, have failed to keep pace with operations more favorably situated.

By the plan shown in the accompanying illustration complete extraction by slicing would begin near the point *A*, Fig. 1, as soon as enough development work had been done to establish the system of ventilation and haulage indicated in this drawing and in Fig. 2. Two rib sections only are shown in the illustration. Batteries of three loaders each might prove more desirable, however. In either case rib sections may be chosen, the dimensions of which would be such that one machine could successfully load out one such section per shift, or at the rate of 350 tons per machine per day, making a total output of approximately 1,000 tons per battery.

The details of the suggested operation are shown in Fig. 1. Starting at point *A*, after the coal has been undercut and shot down, the mechanical loader would proceed to load out. At this point the short haul entailed makes it certain that no difficulty would be experienced in keeping the interval for changing cars down to a minimum. The loader operating upon the track laid previous to the shooting could readily tram each loaded car to a point on the parting just clear of the first diagonal crosscut and in the meantime an empty car could be placed ready to follow the machine back to the loading point.

After passing point *B* the loader could much more readily pick up the empties after delivering the loads to the loaded storage tracks, and after passing point *C* the track layers could begin transferring track from position 1 to position 3, simultaneously setting props and cap pieces between track positions 2 and 3.

In the transportation scheme as above suggested the intention is to keep the working track or tracks as near the solid rib as possible in order to insure the safest working conditions, but where experience with the roof would justify allowing a greater distance consistent with safety, track position 1 could be used alternately



FIGS. 1 AND 2. SUGGESTED METHOD OF EXTRACTING COAL WITH HELP OF LOADING MACHINE

Each rib section is made just so long that the coal from it can be loaded in one day. It might be well to have three instead of two sections in any one panel. By arranging the sections in line with each other, ventilation, drainage and inspection are made more easy. Inspection is particularly important with a division of labor such as is involved in the use of machines.

with track position 2 while track laying in position 3 progressed in preparation for the next advance against the rib. This arrangement would allow of spotting empties alongside the loader in partial or complete trips, making continuous loading entirely possible.

Fig. 2 illustrates in general the plan of ventilation and haulage. A rib section arranged for two or more machines is driven toward the boundary of the property. Adjacent to the block of coal being mined a block of similar breadth is reserved to facilitate haulage and ventilation. When the boundary is reached and the blocks on either side of the haulage section have been removed, mining on the retreat is begun in the pillars of the remaining section. This means that a maximum output for a given plan once attained would be available until the coal area is finally exhausted as far back as the shaft pillars.

Under favorable conditions the length of a rib section might be greater than could be handled by a single loader in a single shift, thus requiring fewer track changes per ton of coal mined, but the faster the work advances away from the gob area the more satisfactory will be the results.

Track work should be so standardized that a minimum amount of work and time will be required in shifting positions. Steel ties and even switch sets with properly designed fastenings and 20-ft. rail sections of sufficient weight to materially reduce the number of ties needed would greatly facilitate the work.

METHODS SHOULD BE EVOLVED METHODICALLY

The method of timbering followed is a highly important part of such a plan as this, for it determines to a large extent the average depth of cut and the width of the mine car that may be employed. Whether the coal should be undercut, centercut, snubbed or otherwise treated also is a matter affecting the manner in which the coal is prepared for loading and to a large extent governs the loading capacity of the machines.

This entire subject is one in which most coal operators are interested. Comparatively few of them, however, are tackling the problem in a serious manner. Most of them are agreed that the mining systems followed in various fields must undergo certain changes, and that mining engineers and manufacturers of mechanical loading devices must co-operate and each become more familiar with the actual requirements of the other under the test of actual operating conditions.

Any company now mining coal by any of the prevalent room-and-pillar systems and hoping to keep abreast of the times can well afford to reserve a section of the mine for experimental purposes. The officials may thus obtain the data necessary for making a complete underground layout for a certain district or area to be mined in a manner suitable to a certain type of loading machine. Needless to say, an enthusiastic organization will be the first requisite to success in this direction.

Prior to the removal of any coal, data should be procured so that subsidence of the surface, above and bordering upon this area, can be measured and recorded throughout successive intervals of time both during and after the process of mining. The quantities of water occurring within the mine both before and after surface cracks appear should be measured and these quantities considered in relation to surface drainage. A study of roof movement below ground in conjunction with that of the surface will finally determine just what can be done in the way of roof control over the area in question. It has been said that the difference between good roof and bad roof may often be measured by the difference between good and bad management. There can be little doubt that success or failure often will be dependent upon the knowledge the individual mine organizations have of the fundamentals of roof control.

Considerations mentioned so far are all subjects which, taken up separately, could be amplified many times. Some details that may occur to others as having an all-important bearing upon the subject, no doubt, have been omitted, but as a concluding remark it should be stated that the psychological effect of changing from an established system of mining to one that is new and untried is among the important problems to be met. The transition must, therefore, be approached in a manner that will give the miner confidence in the new plan, which in itself must offer no greater hazards to life and limb than the system to be abandoned.

Keying a Large Ventilating Fan to the Shaft Of Its Driving Engine

BY F. C. SINBACK
Oak Grove, Ala.

SOME time ago, while in the employ of a large coal-mining concern, I was called on to make a repair to a large multi-blade ventilating fan. This machine was driven by an engine, being mounted directly on the crankshaft. A short time after it had been put in operation it was found to be "working" on the shaft and "wallowing" its keyseat and feather key.

As the fan was designed and sent out from the factory it was intended to be pushed onto the shaft over a feather key as shown in Fig. 1. No taper was given the keyseat, and as the fan was large and heavy and as it had to be assembled on the shaft in the field at the place of erection, it was given a fairly loose fit, so that it easily could be pushed and bumped into position. Had the fan been belt-driven or connected to an electric motor, where the pull would have been practically constant throughout a complete revolution, I think this method of fastening would have been successful. As the fan was rotated, however, by a single-cylinder engine with no flywheel other than the fan itself, it is plain that as it passed over the centers, which are dead points, the fan had to drag the engine. As soon as the engine passed either center it imparted a decided impulse to the fan.

This action resulted in the engine pulling the fan at one moment and being pulled by the engine at the next. Hence if there was any slack whatever between the key and its seat, and that might be expected, as the hub of

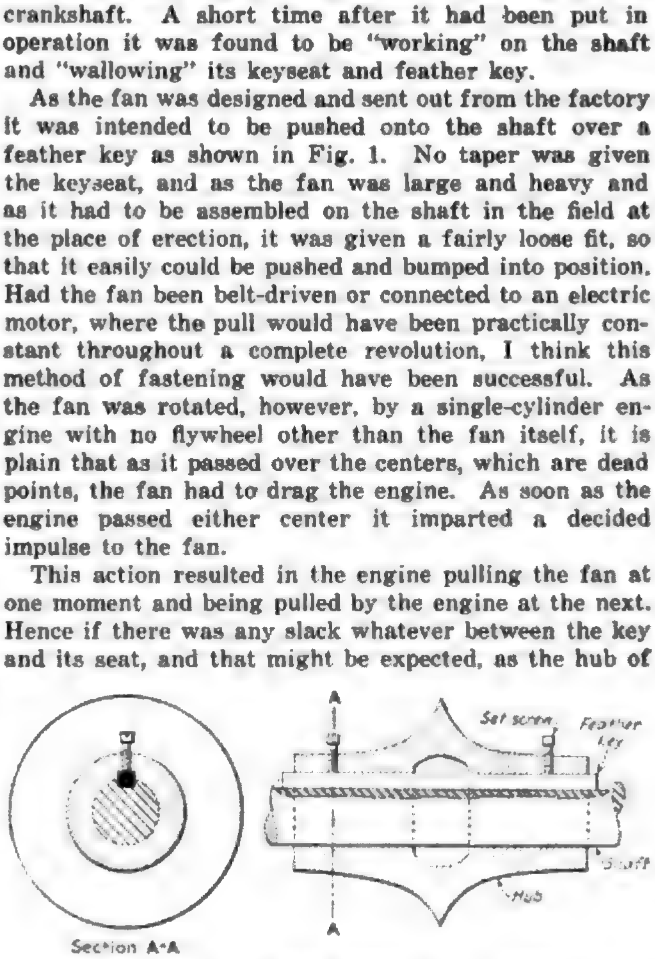


FIG. 1. FAN HUB AS IT LEFT THE FACTORY

A feather key without taper was laid in a seat in the shaft. The hub of the fan was slipped over the feather and held in place by two setscrews.

the fan fitted the shaft loosely enough to be assembled at the point of erection, there would be a slight movement of the hub relative to the shaft. This would occur twice during each revolution. It would be small to start with, but would gradually wear the key and keyseats, and also the hub. This wear would become more rapid each day, and soon the hub, keyseats and key would be ruined. The shaft also might be reduced in diameter appreciably. This is what would have resulted to the fan in question had it not been shut down and repaired.

Fig. 1 shows the only method provided for keying the fan when it was shipped from the factory. To give the fan a firmer grip on the shaft a hand-operated keyseating machine was used to mill out, deepen and true up the keyseat in the shaft. The keyway in the hub, being in fairly good shape, was left as it was. A second keyseat was milled in the shaft about 90 deg. from the first. This had no corresponding keyway in the hub, and the keys to fit it were machined on the upper side to conform to the curvature of the hub bore. As the keyseat in the hub had no taper it was necessary to use wedge fillers or liners under the taper keys, as shown in Figs. 2 and 3.

The fan was brought to proper position, the keys fitted and driven home with a drift and sledge hammer.

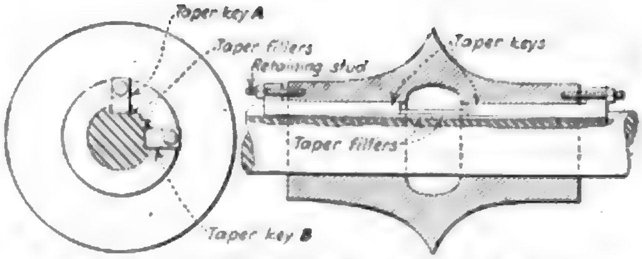


FIG. 2. HUB AS MODIFIED AFTER SLIPPAGE

Another keyseat was made 90 deg. from the first and the old keyseat was deepened. As neither of these was tapered, fillers with a taper were inserted in the keyseats. Tapered keys were used and these were tightened and held in place by retaining studs as shown.

After operating for one day the keys were again driven and this was repeated once a week for some time thereafter. On the first few drivings they moved up a little each time, but after this they failed to budge, showing that they were thoroughly seated metal to metal.

I think where a machine of this character and size has to be assembled in the field it is a mistake to use a feather key. I believe in taper keys for this class of work, for the hub in this case can be easily slid into position and the keys driven home. This procedure forestalls all possibility of the fan working on the shaft.

Draws Lesson in Prosperity Campaign from British Coal Strike Settlement

IN HIS address before the American Mining Congress in Chicago, Oct. 17-22, 1921, George Otis Smith discussed "Some Items in a Prosperity Campaign." What he had to say on the British coal strike settlement is significant because he spent some time in England last summer and speaks from first-hand knowledge. That part of his address dealing with this subject follows:

"The last item that I wish to mention, but an item that in no respect least deserves your attention, concerns the product of industry. Any formula for national prosperity must include a plan for a more equitable distribution of the benefits than now prevails; prosperity must be spread over the whole country. The working up of our abundant raw materials by skilled American workmen operating high-powered machinery on a full-time schedule will surely mean production of what the world needs at low costs, but to whom do the proceeds belong?

"The product of the coal mine or of the steel plant is plainly a joint product—a product in the creation of which both capital and labor have joined effort—so that it is equally plain that product sharing must follow. Note, please, that I avoid the term profit sharing, for these are days when too often there are no profits to share, and, moreover, for too many centuries has a sharp distinction been made between wages to labor and profits to capital. The value of the product includes everything and should rightfully be shared by both.

"The British coal settlement put into effect last July impresses me as a long step toward the full recognition of labor and capital as partners. It is too soon to know whether this settlement will work out in practice so as to satisfy the mine worker by giving him the wage he wants and satisfy the mine operator by yielding cheaper production and larger output, yet I believe this settlement expresses true economic theory.

"First of all, the British plan puts the emphasis upon what ought to be the obvious rule in all industry—that of gaging wages by results, a sliding scale that works up and down automatically with the net returns of the business. Second, this sliding scale applies to both partners, for the standard wages to capital, unfortunately called 'standard profits' in the agreement, are proportional to the standard wages paid to labor—a significant recognition that operating costs must include payment of wages to capital as well as to labor before there can be any surplus available for distribution. Incidentally, the agreement further provides that if the proceeds from the sale of coal are insufficient to pay more than the standard wages and other production costs, thus defaulting in the payment to capital, this deficiency is carried forward as a first charge against any future surplus.

"Finally, under the terms of this British coal settlement, after invested capital is paid its determined wage of 17 per cent of what is paid to labor, any surplus remaining is divided 83 per cent to labor and 17 per cent to capital, a division of net returns that seems equitable in its general principle and probably fairly correct in detail. This is an example of product sharing, and its inherent justice ought to appeal to both mine worker and mine owner and thus clear the atmosphere around the pit mouth. The mine worker should see that his wage depends not so much upon the market price of coal as upon his own effort in lowering its cost, that he will share in the company's success in selling coal at a profit, that he is in truth a partner in the business.

"Last August, when I discussed this new plan with representatives of the British coal industry, it was too early to judge the plan by results, but there was hope for a larger per capita output—a hope based in part upon reports from the mines. Cheaper coal seems absolutely essential to Great Britain's domestic industry and foreign trade, and this stimulation of the coal miner by offering him a tangible share in the product of his labor is both just and opportune. And inasmuch as American industry in general also needs cheaper coal, it may be equally opportune for us to consider as a leading item in our prosperity program some plan for product sharing that, because it is just to both labor and capital, will speed up our coal-mining industry and benefit all the industries dependent upon it.

"But no plan of product sharing will help unless we have the product to share, the proceeds to divide. After discussing these four items in a prosperity program, I can sum it all up by saying with my friend Mr. Ingalls, 'The only foundation for prosperity is production, and in the present juncture the needs demand the labor of everybody for at least eight hours per day and six days per week for such wages as can be got.' Under those terms there may again be good times to be shared by all."

Book Reviews

Putting Thought Into Mine Management

THE human element was the last and the least of the studies of the engineer of the past. For all Alexander Pope's saying, "the greatest study of mankind is man," we went along quite well satisfied with little of the greatest of studies. For a while it was not even in the college curriculum. Instead of looking ahead we bulled our way through—somehow. We learned a little, it is true, from these frequent collisions and repercussions. But now, at last, we are trying feebly to get somewhere, out of the air, a science of management. Perhaps the ways of men after all are as amenable to study as the ways of a pump or the vagaries of a turbine.

To this end Robert Z. Virgin, assistant professor of mining in Carnegie Institute of Technology, at Pittsburgh, Pa., has published a little book of fifteen lessons on "Mine Management" intended for the classroom. Many an executive will read it over to question himself as to whether he has just the right slant on his personnel problems. In its 109 pages many a subordinate will glimpse the problems of the "higher up," and rest better content when he knows others have troubles as well as himself.

"Mine Management" is a little book, 5 x 7¼ in., that can be read in a night and serve for reflection the better part of a year. After all, managers, like engineers, are truly born and not made, but the best of us are bettered by studying the fundamentals of the profession, adding thus expert knowledge to temperament and good judgment. Every chapter is followed by questions which seem to trench deeply into theories of management. Most of us could write a book on the subject ourselves. Perhaps we would be better for the experience if we did. But in any event, this little book, published by D. Van Nostrand Co., of 8 Warren St., New York City, will give us a chance, whether we be home-office executives at one end of the scale or firebosses at the other, to talk it all over with a man who has faced many of the problems by which we at times have been sorely nettled.

Coal as Modern Science Knows It

WELCOME to our bookshelves is a small 462-page volume on "Coal, Its Properties, Analysis, Classification, Geology, Extraction, Uses and Distribution." The author, Elwood S. Moore, professor of geology and mineralogy and dean of the School of Mines of the Pennsylvania State College, has succinctly covered in that title the character of the book. As there are only 63 pages in aggregate dealing with extraction, coal preparation and coking, the book only incidentally discusses the mining and handling of coal. The nature of coal in itself and in relation to its geological surroundings is well and adequately described by the author, whose more distant travels have taken him to Alaska, Alberta, England, France, Australia and New Zealand, if not to many other coal-producing areas, if indeed Alaska after so many futile years of conservation may really be said to be producing today.

As may be supposed from the character of his travels, Dr. Moore's volume is more international in its scope than many others which come to the reviewer's desk. He has drawn extensively from the springs of knowledge that rise in France and England, as well, of course, as from those that are more familiar to most of us. The geology of the coal measures in the United States is quite acceptably treated, enough cross-sections of strata being given to enable the reader to get a general knowledge of the order of their occurrence and of the intervals that separate them.

Much diligence has been shown in the preparation of this book. The author must have painstakingly prepared himself for the task by a careful indexing of coal literature extending over many years. It is, therefore, well balanced, the more important matters being given their appropriate place. Many books are filled with interesting information, but too often the omissions are as deplorable as the inclusions are pleasing.

The book measures 5⅝ x 9¼ in. and is published by John Wiley & Sons, Inc., of New York City. The book has 20 plates and 142 other illustrations. It will be a worthwhile addition to any coal man's library.

Australia and Orient Seek Cost Sheets Of National Coal Association

FROM a coal company in Sydney, Australia, came a request last week to the National Coal Association for copies of the report of the association's cost accounting committee and the coal cost sheets prepared by the association.

In forwarding the papers, W. B. Reed, secretary of the National, stated that the cost sheet had been given wide circulation throughout the United States. A great many companies, he said, have adopted it in its entirety; others have condensed the report, adopting the main features. In probably more than half of the local associations which compose the membership of the National Coal Association, he added, this form of cost sheet is used as the official form on which to collect coal costs.

"In the interest of education we are always glad to send these pamphlets to anybody," Mr. Reed said. "Just recently I had a request through the American Institute of Accountants for a copy to be sent to a gentleman in Tientsin, China. We also have sent them to Alaska, British Columbia, Mexico and Central America."

Under-Water Storage Entails Unnecessary Expense If Coal Is Carefully Handled

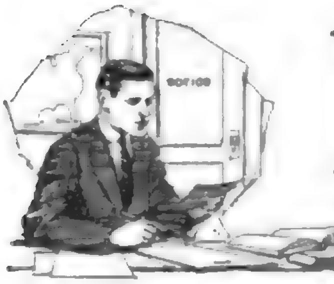
AT each of the terminals of the Panama Canal there are facilities for storing coal under water. Some question arose recently as to the relative merits of wet and dry storage of coal. The Governor of the Canal Zone referred the matter to Prof. H. H. Stoek, of the University of Illinois.

Prof. Stoek replied as follows: "I would report that several companies in Illinois have used under-water storage apparently with success. One of the first companies to use this form was the Western Electric Co. in Chicago, which has a number of concrete pits, also the Illinois Traction Co. has used this method at several of its larger power plants. Several of the zinc companies in the state have used old sloughs for temporary storage and in a similar manner a number of mines have used these sloughs for excess production. The largest under-water storage plant of which I have been advised is that of the Standard Oil Co. at Whiting, Ind., where provision has been made for 100,000 tons. The Duquesne Light Co., of Pittsburgh, also has a large under-water storage plant. In the absence of negative reports from any of these companies I assume they have found under-water storage satisfactory. Experiments made at the University of Illinois on small quantities of coal under water have shown practically no deterioration.

"The two large plants above referred to, namely, those of the Standard Oil Co. and the Duquesne Light Co. are of too recent construction to have very conclusive results extending over a sufficient period of time.

"Under-water storage is, of course, best adapted for fine sizes of run-of-mine coal where it is necessary to have a mixture of sizes and a considerable amount of fine coal and dust in the material stored. If the coal can be properly sized and carefully handled I do not believe it is necessary to have under-water storage, as the expense of the plant is, of course, materially greater than ground storage."

STYLES FOR GOVERNMENT BUREAUCRATS must change, says Controller Dawes, advocating a lower waste line.—*Brooklyn Eagle.*



Problems of Operating Men

Edited by James T. Beard

Formation of Coal Seams

Delta Theory of Coal Formation Refuted—Evidence of Elevation and Depression of Land Areas Support In Situ Theory — Other Evidences Contradict Delta Theory

WITH much interest I read the article supporting what may be called the "delta theory" of the formation of coal seams, by H. W. Hixon, *Coal Age*, Jan. 5, p. 8, which was followed a little later by the letter of W. N. Page, in the issue, Mar. 9, p. 414.

The arguments presented by these gentlemen, I must admit, have failed to convince me that they prove the correctness of this new theory which they claim explains more perfectly the formation of our coal seams. While the subject is not a practical one, it is, nevertheless, of great interest and well forthy of discussion.

Fortunately, or unfortunately, our span of life is far too short to ever hope to unravel the mystery of the actual formation of a coal bed by observation and records made from its inception to the completion of the deposit. Our theories must, therefore, remain theories supported only by deduction and analogy.

To Establish a Theory

In building up a theory, it is necessary to marshall all the available facts as evidence for and against the assumed hypothesis. These separate facts must then be weighed to show a predominance in favor of or in opposition to the theory, which must remain pure assumption, unless the evidence is uncontrovertible.

In his article, Mr. Hixon states that "the theory of growth in place . . . makes the unreasonable assumption that the earth has vibrated like a drumhead." That is to say, there must have been periods of elevation and depression of the surface alternating each other. It is quite clear that this writer holds to the belief that the material forming our coal beds has been transported hither as drift and deposited as sediment at the mouth of enormous deltas.

By way of analogy, reference is made to the well known action that has been observed and studied in the great delta of the Mississippi River. Much of the evidence advanced, however, disproves the contention that the alternate elevation and depression of the earth's surface (making possible the theory that coal was formed where the vegetable matter composing it grew) "is open to many serious objections."

In support of this statement, for instance, allow me to refer to Mr. Hixon's assumption that, preceding the formation of the Appalachian coal measures, "a continent existed to the east of the present continental mass of North America." He seems to forget that this involves a like assumption that said continent was later depressed or the Appalachian area elevated to conform to its present condition.

The So-Called "Delta Theory"

In working out his delta theory, that writers' claim is that the deposits of the Appalachian system and the great central coal basin were laid down as a delta at the mouth of a great river system traversing his alleged Eastern Continent.

He argues further, in support of his claim, that "sediments are always thickest in the direction from which the material composing them was derived." That, he assumes, accounts for the thicker deposits in the eastern part of the United States and their thinning out towards the west.

Another reference to the formation of the Reelfoot Lake, in Tennessee, by reason of a submergence of that area during the earthquake of 1811, also supports the theory of the unstable condition of the earth's surface, as claimed in the justification of the "In situ" theory of coal formation.

Again, reference is made to the formation of small islands, in the Mississippi River delta, which represents, on a small scale, the same changes that are taking place in the elevation of the surface of our globe. All of these go to prove as an actual fact the "unreasonable assumption" of the vibration of the earth's surface.

Arguments Supporting the "In Situ Theory"

Allow me to cite briefly a few facts in support of the old theory that the coal was formed where the vegetation once grew. To my mind, it is the policy of wisdom to accept the simplest explanation and observed facts, and not attempt to explain them away by difficult reasoning.

1. Much of our coal is pure and contains little besides the original vegetable matter. Regarding the ash of the coal, many modern plants that are allied to the coal plants contain as much as 5 per cent of ash, a few contain much more. It is hardly conceivable that such purity of vegetable matter could be attained in the formation of a delta deposit.

2. There are coal beds of a very uniform thickness extending over large areas, sometimes thousands of square miles. According to Mr. Hixon's own statement, this uniformity could not be expected in a delta formation. It is suggestive, rather, of a large swampy forest of luxurious undergrowth.

3. The vertical position of tree fossils, in the coal formations, might be accounted for by Mr. Hixon's ingenious explanation, but for the fact that the roots of these trees are all found in the underclay that formed the original floor of the coal seam and in the same horizontal plane. If that writer's idea was correct the roots and bases of the trees would occur at different heights in the seam, which is not the case.

4. The imprints of ferns and other plants found in the coal measures are often so perfect that it is hard to conceive of those plants having been drifted long distances and still retaining their perfect form.

5. The vegetable matter forming coal shows an intermingling of trunks, small stems, leaves and fruits of various plants, in such proportions as might be expected to occur in the growth of a swampy forest. But, in the formation of a delta there is always a segregating process that would cause isolated collections of driftwood and much foreign material, which is not found in our coal seams.

6. Finally, the well known Dismal Swamp is a present-day example of vegetable matter accumulating, in quantity, with little mixture of sediment. To my mind, these simple facts point strongly to the "In situ theory of coal formation.

J. B. de Hart.

Nacmine, Alberta, Canada.

ANOTHER LETTER

Vibratory action of the earth's surface proven by observed facts—Many difficulties in adopting the drift theory of coal formation.

THERE appeared in a recent issue of *Coal Age* an interesting article, which attempted to set aside the general theory of the formation of coal, chiefly on account of the necessary assumed vibration of the earth's crust, which in the opinion of the writer appeared ridiculous.

The theory offered in place of this is that our coal fields were once great river deltas. The rivers carried down coarse and fine sediment, along with a large amount of floating vegetation. At the mouth, the coarse sand settled first, followed by the finer material, and last of all the woody matter became waterlogged and sank far out from land.

As the delta progressed, each of these beds advanced forming in ascending order mattresses of woody matter, layers of fine mud and of sand, which afterward consolidated and formed the coal measures, including shales, slates and sandstones.

Some Serious Difficulties

There is certainly some ground for this theory; but when we examine closely the data we meet a few serious difficulties. Let us look, first, at the vibration of the earth's crust which is given as the chief objection to the old theory.

At first sight, the idea seems strangely absurd; but if we assume the formation of coal beds by river deltas we are still forced to admit this phenomenon. In nearly all coal fields there are several beds of the mineral. In this one, the Harlan field, there are twelve beds of coal that are workable or nearly so, separated by layers of slate and sandstone, ranging from 100 to 1,000 ft. in thickness.

Now, after the formation of one bed by a river delta, there could only be one way to form another and that would be to start again and build a second as the delta advanced, which could only occur by the earth sinking, and later being elevated as it now stands.

Nor is it only in the coal fields where we find marks of the earth's vibration. A striking example is seen on the Saguenay River, Quebec. In places, the formation has the marks of old sea beaches, as high as 200 ft. above the water, while the bottom is far below sea level.

Alternate Elevation and Sinking

The vibration, as told by this formation, shows there must have been, first, an elevation while the river cut its bed; later, a subsidence till the sea flowed up the valley; this being followed by another elevation of the strata to its present position.

It is hard to see how, in the laying down of the coal beds with a following cover of clay, a river could deposit an even layer of clay, a few inches from the top of the bed, over such great areas. In fact, nature has not always been careful in the selection of partings, as would be expected if they were laid far out from land.

Near Coeburn, Va., there is a coal seam having a sandstone parting of about two inches and in many mines in this field the roof is of sandstone lying directly on the coal.

It is hardly reasonable to assume that a tropical plant, a fern for instance, could be floated down a river several thousand miles, perhaps, and then become waterlogged and sink and still leave an impression in the covering silts, perfect to the smallest pinnae. It does not follow however that coal can only be formed in tropical climes producing such plants.

I have seen peat bogs, in New Brunswick, stretching as far as the eye could reach; and one could only guess at the depth of the bog. Also, I have read that there are large areas of the same in Ontario, the Northwest Territories and in Alaska. If these bogs should later be covered with mud and sand, it does not require a great imagination to see them eventually turned to coal.

Another fact about coal is the prevalence of fireclay underlying the seam. A large percentage of all coal seams are thus underlaid with this material. It differs from the surrounding rock in that it is free from such substances as iron that plants would take in growing, so that if the stumps in the roof could have been carried there we still have reason to believe that most of the material may have grown there.

Coal Beds Originally Vast Swampy Areas

Taking all facts into consideration it would look more as if our coal beds were once great swamps with choked drainage and which held the humic acid that prevented the dead plants from decaying. Thousands of acres were thus covered with a thick layer of peat.

Gradually the land sank and the sea crept over the marshes. Rivers brought in silt and the sea spread it evenly over its bottom. But this condition was short-lived and soon the land, over great areas, was once again elevated a little above water level; and great forests of giant ferns again covered it and, for ages, kept piling their fallen trunks into a thick woody mat.

Again the sea advanced so slowly, perhaps, that it was scarcely noticeable; but this time it was to stay for ages, with its bottom gradually sinking and being filled with sand almost as fast as it subsided.

Then, later, another great change took place. The sea bottom rose till it was several thousand feet above the surface. Swift streams cut deep valleys through the old sediments and, in time, man came and found in the side of the valley a seam of coal having a fireclay bottom, a sandstone top, and near the center a slate parting partially turned to fireclay. FRED ROSS.

Lenarue, Ky.

Do Foremen Sleep on the Job?

No chance for a foreman to sleep on the job—Superintendents duties give him no opportunity—The superintendent responsible for the upkeep of the mine.

IN A LETTER appearing in *Coal Age*, Feb. 23, p. 333, James Thompson accuses some mine foremen of losing their ambition and permitting the mine in their charge to go to the bad to such an extent that it is almost unredeemable and much money is lost by the operator.

If there are such foremen in charge of mines it has never been my misfortune to meet them, during my fifty years of mining, here and in the old country. It is true that some men are not as good managers as others and unable to get the same results; but the superintendent is to blame if he permits the bad management of a foreman to damage the mine, in his charge, to the extent mentioned by Mr. Thompson.

Superintendent to Blame If Foremen Fail

As a rule, the mine foreman is under the direction of the superintendent and that official, if at all efficient, will never allow conditions to become so bad in the mine as to cause the loss of a large amount of money to his company. I have never found a superintendent that would permit his foreman to sleep on the job, for which he himself would suffer eventually.

For the most part, the duties of a superintendent require him to see that the upkeep of the mine and its development are not neglected. His eye is ever on the daily cost-sheet. True, it may often happen that the management of a mine will restrict the superintendent in the matter of expense for development work; but that need not result in permitting the mine to run down if the superintendent is a capable man.

Speaking of an incompetent mine foreman, Mr. Thompson suggests that such a one should be punished in a way that he will remember and his certificate withdrawn. In this regard, let me say that a man's certificate has little weight with the management of a mine. In the selection of a mine foreman, little regard is had for the certificate that the man may hold. The real object under consideration is the man himself. When seeking a position as foreman, the applicant must have more evidence of his ability than a mere certificate.

Sullivan, Ind. R. J. PICKETT.

Industrial Waste

Coal mining no exception to industrial waste—Mine officials responsible for good working conditions — Inefficiency of mine labor twofold—Disregard of mine laws and regulations and ignorance of miners cause of much waste.

"WHO is responsible for industrial waste?" This question formed the title of an excellent article, by R. Dawson Hall, *Coal Age*, Jan. 12, p. 50, and impressed me very forcibly.

The article commented on the report made by a committee of engineers appointed to make investigations with a view to eliminate unnecessary waste in industry. I have since read the report myself and it caused a slight thrill of alarm when I contemplated its full meaning.

In what I have to say there is no reflection on the local management of the mine where I am employed. My experience is wholly one of mining coal and, from a special study of mining conditions in all my travels, there is no flattery in saying that both the superintendent and the mine manager (foreman), here, have made a remarkable record for themselves.

Although handicapped by an old worn-out system that cannot keep step with recent developments, these two officials have been able to produce a tonnage, from this old remodeled mine, that cannot be beat by any one no matter what may be his experience.

Notwithstanding all this, it has been impossible for them, by reason of the condition against which they labored, to eliminate some of the items of waste in operating the mine. The most important item, in this regard, was the ventilation of the working places in the mine.

Most of us have our particular hobby and mine is probably ventilation. No one familiar with mining will deny that this is a chief factor in the operation of a mine. As in the present case, mine officials are not always to be charged with waste, as being due to inefficient management.

Efforts to Improve Ventilation Not Always Successful

In the mine to which I refer, the ventilation became inadequate about three years ago when it was decided to install a new fan. A large fan of the Jeffrey type was then put in operation at the mine. The air-courses were cleaned up and the stoppings repaired, but still there was little improvement in the working places where the air was very weak.

The last report of our district mine inspector stated that the mine was "in fair condition, except the ventilation," and made certain recommendations with which the management complied gladly. There is no doubt, however, but that all mine officials are responsible for good working conditions as far as these can be improved by them.

Turning now to the waste for which mine labor is responsible, I would say it is of a twofold nature; namely, disregard for mining laws and regulations, on the part of the men; and the ignorance and wilfulness of a large number of the workers.

To overcome the first of these causes greater discipline is required in the mine. It is the duty of every mine official to see that their instructions are promptly obeyed. Violations of orders should be punished by a suitable penalty. In regard to the second, men that are wilful or ignorant must be educated to a different attitude. Men must be given work that they are capable to perform. There is always a waste when aged men or men incapacitated for work are employed.

The real problem that confronts the mining industry, today, is to ascertain and eliminate these different items of waste so that the coal industry can be brought to an efficient standing. The same rules and principles that have developed the high standard of the Army and Navy should be applied alike to the mining of coal if the standard of the coal industry is to be raised.

Staunton, Ill. **Henry Bock.**

Inquiries Of General Interest

Fire on a Heavily Timbered Mine Parting

Fall on Mine Parting Timbered to a Good Height—Much Dust Accumulated on Timbers to Which Trolley Wire Is Anchored—Fire Occurs Due to Some Unknown Cause

While on a visit to a certain mine, a few weeks ago, I became much interested in the question of the possible cause of a fire that had started in the timbers on the shaft bottom. There was considerable difference of opinion expressed among the men as to the cause of the fire. Following are the facts, as I gathered them:

A heavy fall of roof had occurred, sometime since, on the shaft bottom and, as a result, the parting had been timbered to a considerable height. Naturally, there was much dust accumulated on these timbers. I found that the trolley wire extended to within 25 ft. of the shaft. At that point, it was anchored to the timbers by a chain and an insulator to prevent the short-circuiting of the current.

A little investigation showed, however, that the end of the trolley wire was turned upward into the dusty cribs. On this account, it was thought by some that a possible sparking of the wire in contact with the timbers had ignited the dust. On inquiry, I found that the fire was discovered by the nightshift about 9 p.m. It started just at the point where the trolley wire ended.

The track here was covered with oil that had dripped from the can when oiling the cars, before hauling trips into the mine. Added to this, the water pipe at the side of the track was inclosed in a box filled with manure to prevent its freezing. The fire was a bad one, though well fought by the rescue team sent from a nearby station. The twenty-four mules in the mine were all lost, though every possible effort was made to save them.

Some two weeks or more after it was thought to be under control and new timbers had been put in place, the fire broke out afresh and it became necessary to seal the place. Now, I have been wondering if it was possible, under the conditions described, for this fire to have been caused by the sparking at the end of the trolley wire. Will *Coal Age* and its practical readers give their opinions in this regard? It is quite likely that some have had a similar experience. **Inquirer.**

———, Ill.

This is an interesting question and one that we hope will bring out good suggestions from many readers. In our opinion, it is quite probable that the origin of the fire was the ignition of the dust, caused by the short-circuiting of current, at the unprotected end, which was probably in contact with the dust-covered timbers above the road, consisting chiefly of cribs of split props.

If the dust was damp or moist that condition would invite a short-circuiting of sufficient current to start a smoldering fire in the dusty timbers. Then, the dropping of glowing embers and particles of dust onto the oily tracks below would soon develop a disastrous conflagration that would not be long in spreading and enveloping the timbers in the entry. We shall be glad to have this question further discussed.

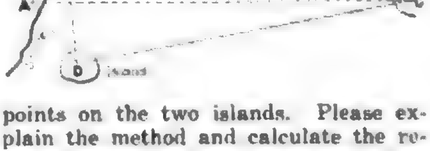
Surveying Problem

Bearing and distance between two small islands determined by triangulation, from baseline on shore.

In order to ascertain the relative position of two small islands lying some distance off shore, a baseline *A B* was established and bearings taken from *A* and *B* to the points *C* and *D* on the two islands, respectively, giving the following data:

Base, A-B, N 35° 00′ W, 100 yd.; B-C, N 40° 00′ E; B-D, S 68° 54′ E; A-C, N 30° 00′ E; A-D, N 82° 21′ E.

It is desired to find the length and bearing of the line *C D*, joining these points on the two islands. Please explain the method and calculate the required length and bearing of this line.



R. T. Stewart.

Fernie, B. C., Canada.

Referring to the accompanying figure, it is necessary to calculate the two triangles *ABC* and *ABD*, to ascertain the lengths of the lines *BC* and *BD*, respectively. Then, the length and bearing of the line *CD* can be calculated from the triangle *BCD*.

First, find the angles *ABC* and *BCA* from the given bearings; thus, in the triangle *ABC*, angle *ABC* = 105 deg.; angle *BCA* = 10 deg. Then, since the baseline *AB* is 100 yd., we have

$$BC = 100\,\frac{\sin 65^\circ}{\sin 10^\circ} = \frac{100 \times 0.90631}{0.17365} = 521.9 \textit{ yd.}$$

Likewise, in the triangle ABD, angle *BDA* = 28° 45′ and the exterior angle *XAB* = 62° 39′; and we have

$$BD = 100\,\frac{\sin 62^\circ\ 39'}{\sin 28^\circ\ 45'} = \frac{100 \times 0.88822}{0.48099} = 184.6 \textit{ yd.}$$

Therefore, in the triangle *BCD* we have found the two sides *BC* and *BD*; and as the angle *ABD* = 33° 54′ the angle *CBD* is 105° 00′ — 33° 54′ = 71° 06′. But when two sides and the included angle of a triangle are given, the ratio of the sum and the difference of the two sides is equal to the ratio of the tangent of the half-sum and the tangent of the half-difference of the two remaining angles. The sum of the two sides just found is 706.5 yd.; and their difference 337.3 yd. Also, the half-sum of the two remaining angles is

$$\tfrac{1}{2}(180^\circ - 71^\circ\ 06') = 54^\circ\ 27'.$$

Then, the half-difference of these angles is found; thus

$$\frac{\tan \tfrac{1}{2} \text{ difference}}{\tan 54^\circ\ 27'} = \frac{\tan \tfrac{1}{2} \text{ diff.}}{1.39936} = \frac{337.3}{706.5}$$

$$\tan \tfrac{1}{2} \text{ diff.} = \frac{1.39936 \times 337.3}{706.5} = 0.66808$$

The angle corresponding to this tangent is 33° 45′, which is the half-difference of the two remaining angles. Adding the half-difference to the half-sum gives the greater, and subtracting the half-difference from the half-sum gives the lesser of the two angles.

Therefore, the angle *BCD* is 54° 27′ — 33° 45′ = 20° 42′.

Finally, the bearing *CB* being S 40° W, the bearing *CD* is found by subtracting the angle *BCD* from that bearing, which gives S 19° 18′ W.

The length of the line *CD* is now calculated, from the triangle *BCD*, in the same manner as before; thus,

$$CD = 521.9\,\frac{\sin 71^\circ\ 06'}{\sin 88^\circ\ 12'} = \frac{521.9 \times 0.94609}{0.99951} = 494.0 \textit{ yd.}$$

The required course *CD* is, therefore S 19° 18′ W, 494.0 *yd.*

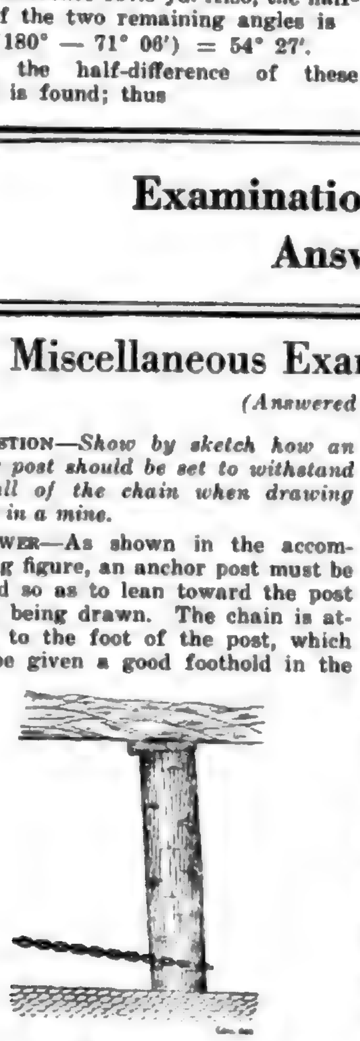
Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

Question—*Show by sketch how an anchor post should be set to withstand the pull of the chain when drawing timber in a mine.*

Answer—As shown in the accompanying figure, an anchor post must be inclined so as to lean toward the post that is being drawn. The chain is attached to the foot of the post, which must be given a good foothold in the floor and made secure by driving a hardwood wedge between it and the roof. In this position, the pull of the chain tends to tighten the post.



Question—*What size of pipe should be used in transmitting 1,000 cu.ft. of air per minute a distance of 4,000 ft., at sea level, when the initial gage pressure is 60 lb.?*

Answer—The volume of compressed air varies inversely as the absolute pressure on the air. Taking atmospheric pressure, at sea level, as 15 lb. per sq.in., the ratio of the absolute pressures, in this case, is 15 : (15 + 60); or 15 : 75 = 1 : 5. That is to say the volume of compressed air will be ⅕ of that of the free air before compression, or 1,000 ÷ 5 = 200 cu.ft. per min.

In the transmission of air in pipes, it is customary to estimate on a velocity of 2,000 ft. per min., which will require a sectional area in the pipe, in this case, 200 ÷ 2,000 = 0.1 sq.ft.; or 0.1 × 144 = 14.4 sq.in. The internal diameter of the pipe must therefore be $d = \sqrt{14.4 \div 0.7854} = 4.28$, say 4½ in.

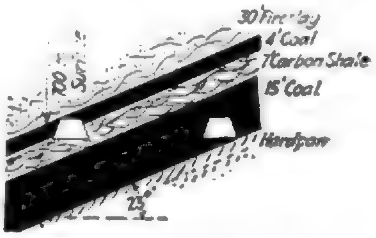
Question—*Is there any loss in converting steam power into compressed air? If so, what are the causes?*

Answer—Yes; there is a mechanical loss of power, due to the frictional resistance of the steam and air cylinders; also, a loss of heat, by radiation; and, lastly, a loss due to transmission of the air through the valves and ducts on the compressor.

Question—*Explain the best method of working two continuous seams of coal lying at an average depth of 700 ft. below the surface and having an inclination of 23 deg. The upper seam is 4 ft. thick and overlaid with a bed of fireclay. The two seams are separated by a parting of shale 7 ft. thick. The thickness of the lower seam is 15 ft. and the floor of the seam is hard.*

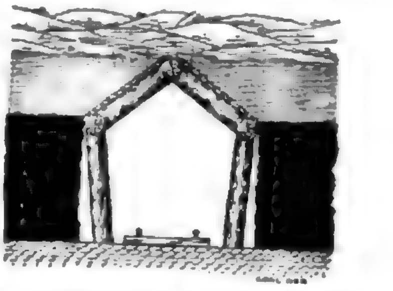
Answer—If these seams outcrop on the property, the mine should be opened by driving the main slopes two or three abreast on the full dip of the seam. These should be driven on the floor of the lower seam and of such a size as to provide amply for the estimated tonnage of the mine. If the seams do not outcrop on the property, a shaft should be sunk as far to the dip of the seam as practicable, so as to provide good drainage and haulage in the mine, having due regard to shipping facilities on the surface.

All coal to the dip of the shaft should be worked out in advance of that to the rise, unless there are reasons for doing otherwise. From the foot of the shaft the main roads or slopes are driven to the dip and the rise of the seam. Gangways or levels are then driven to the right and left of the main slope headings and the coal worked out to the rise of these levels. As shown in the accompanying figure, the haulage road in each level should be driven in the lower bench of the thick seam, while the air-course paralleling this road should be driven in the upper seam and the shale parting dividing the two seams. The rooms in the upper thin seam should be driven in advance of those in the lower seam, so that the pillars can be drawn back before the corresponding pillars in the lower seam are taken out.



Question—*Describe a form of timbering sometimes used where a coal seam of moderate thickness is overlaid with two or three feet of soft strata that falls constantly and gives much trouble on the roads.*

Answer—A form of timbering roads and air-courses, under these conditions, is that known as the "herring-bone" system shown in the accompanying figure. It consists of three longitudinal stringers, one at each shoulder at the top of the coal and a third in the center above the roadway. The two legs forming a timber set are slightly inclined so as to give an outward thrust in support of the two shoulder stringers. The roof stringer is supported by two short struts resting on the shoulder stringers, after the manner of the gable roof of a house. The struts are fitted to the stringers in a manner to afford good support to the lagging holding the loose material to prevent its falling into the roadway.



The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THE optimism that always returns with the opening of spring weather has had much to do with the increase in retail trade and the better feeling generally which has prevailed recently, in spite of the news of floods, strikes and a late crop season. That this optimism is based upon better fundamental conditions is shown by the trend of the figures so far received by the Department of Commerce for use in its latest "Survey of Current Business." Statistics of actual commercial and industrial movements during March, so far as they were available up to April 18, show a profound improvement over the condition a year ago.

"Two outstanding features of more than ordinary importance," the department states, "are the marked increases in iron and steel activity and the big increase in construction. Since April 1 the coal strike has resulted in almost total cessation of work in the anthracite mines and a reduction of more than 66 per cent in bituminous output; however, owing to the exceptionally heavy stocks of coal, this situation has so far had but little effect upon business.

"Consumption of cotton by textile mills in March amounted to 518,450 bales, which is at about the same rate of activity as for February, if the longer month is taken into account. Consumption was slightly less than in January, due no doubt, to the labor troubles in the New England mills. Compared with a year ago, the amount of cotton used by mills shows an increase of 80,000 bales. Exports of cotton in March amounted to 461,484 bales, which, although below the average, was much larger than for either the month before or the corresponding month a year ago.

"The production of both pig iron and steel ingots has been on the increase since last July, but an advance of from 25 to 30 per cent in March, compared to February, marks by far the largest increase for any single month. Pig-iron production of 2,035,000 tons is over 600,000 greater than either the output of the month before or in March last year. This production figure has not been equaled since January, 1921.

"Steel-ingot output, allowing pro-rata for non-reporting firms, amounted to 2,816,000 tons, or 850,000 tons more than in February, and the largest production for any month since November, 1920. The unfilled orders on the books of the U. S. Steel Corporation on March 31, 1922, amounted to 4,494,000 tons, an increase of 373,000 tons over the condition at the end of February. This is the first time the Steel Corporation's unfilled orders have shown an increase over the preceding month since July, 1920.

"Shipments of automobiles reported by the National Automobile Chamber of Commerce indicate a marked improvement over the preceding month. Rail shipments amounted to 25,210 carloads compared to 19,636 in February, while driveaway and boat shipments totaled 16,068 machines, against only 10,353 in the month before.

"Building contracts awarded in the 27 northeastern states during March were valued at $293,637,000, compared to $177,472,000 in February and $164,092,000 in March a year ago.

"Exports in March were valued at $332,000,000, compared to $250,748,000 in February and $386,680,000 in March, 1921. Imports also increased from $215,743,000 in February to $258,000,000 in March. It is too early to say whether these figures mark a turning point in our dwindling foreign trade or not, but they offer some encouragement."

Freight Loadings Fall Further

Loading of revenue freight for the week ended April 8 totaled 714,268 cars, compared with 827,011 during the preceding week, or a reduction of 112,743 cars. This was, however, an increase of 19,387 over the corresponding week in 1921, but a decrease of 87,291 compared with the corresponding week in 1920. The decrease compared with the previous week was due to a falling off in shipments of coal as a result of the miners' strike. Reports, however, showed an increase in shipments of merchandise and miscellaneous freight. Coal loadings for the week totaled 69,456 cars, a decrease from the week before of 115,496.

Coal Strike Stimulates Steel Trade

"The coal strike's effect upon the iron and steel market in the past week," according to the *Iron Age*, "has been seen chiefly in advancing pig iron prices and in increased demand and stiffening prices for rolled products. Actual production of coal has changed little outside of the Connellsville district, where it is somewhat less, and the rate of steel works and rolling mill operations is about 75 per cent for the Steel Corporation and close to 70 per cent for independent companies.

"The volume of fabricated steel business closed in March, 139,300 tons, was almost as much as that of January and February combined and was over 30 per cent better than the March average for the preceding ten years. For the first quarter contracting has engaged about 54 per cent of bridge and structural shop capacity, or only two or three per cent below the average for the last decade.

"Lettings for the past week in fabricated steel exceed 60,000 tons, or half again what is weekly capacity, about 41,000 tons. The figures do not include Seattle's 12,200-ton pipe line, now finally awarded. Fresh structural work requiring 17,000 tons has appeared.

"Pending railroad car business indicates early buying of fully 16,000 cars. Locomotives placed with two builders in the past week number 174 and 25 are under negotiation."

Prosperity Near, Says W. M. Wood

In a recent statement on conditions in the woolen industry, William M. Wood, president of the American Woolen Co., said:

"An era of prosperity is undoubtedly near at hand. The woolen mills of our company are well sold up and at full capacity and, while the worsted business is not normal, it is improving. Our large staple worsted units have sufficient orders to insure their operation at 80 to 85 per cent capacity for a considerable period."

Latest Bland Bill Proposes Commission of Ten to Probe Coal Industry in 2 Years

A COAL commission of ten members—four government officials, two representatives each of operators, miners and the public—to investigate various phases of the coal industry in two years is the latest proposal appearing in Congress. It is fathered by Representative Bland, of Indiana. The civilian members are to receive $6,000 a year salary, while the government officials—namely, the directors of the Geological Survey, Bureau of Mines and the Census, and the Commissioner of Labor Statistics—are to receive no additional pay above that they now receive.

The commission is to be known as the "Coal Investigation Agency" and is designed to procure information for Congress as a basis of legislation to settle industrial disputes and prevent overdevelopment of the coal industry; to stabilize and to levy taxes in respect to such industry, and to regulate commerce in coal among the states and with foreign countries. The agency also is to investigate as to the supply, production, distribution, storage and consumption of coal and its grading and economic utilization; as to the relations between operators of coal mines and their employees, with particular reference to wages, hours of labor and working conditions, and as to the ownership and physical value of coal lands and property of mine operators.

The bill proposes that no person shall ship or receive from shipment in commerce among the several states or with foreign nations any coal during such time in the existence of the agency as such person willfully fails or refuses to make any report required by the agency, the bill giving it full powers, subject to court support, in obtaining the attendance of witnesses and the production of papers.

194,698 Bituminous and 95,000 Anthracite Miners on Strike in Pennsylvania

THE estimated number of miners in both anthracite and bituminous fields involved in the present coal strike in Pennsylvania totals 289,698, according to figures just announced by the State Employment Bureau of the Department of Labor and Industry. Of this number 95,000 are estimated to be anthracite miners on strike and 194,698 bituminous miners.

In the Pittsburgh district 80,398 bituminous miners are reported on strike; the Johnstown district reports 60,000 and the estimated number of miners "voluntarily idle" in the Monongahela-Youghiogheny valleys is 30 000, while in the New Kensington coal district there are 16,000 strikers.

In the anthracate region 60,000 miners are reported on strike in the Scranton district, 20,000 in the Williamsport district and 15,000 in the Harrisburg district.

Clifford B. Connelley, Commissioner of Labor and Industry, in making these figures public April 19, said the reports were based on estimates made by the employment officials of the department's employment offices. These offices are compelled by law to refrain from supplying men where a strike is in force.

The state bureau's figures on employment for the first two weeks of April show that unemployment outside the mining industry dropped approximately 30,000 from the total of 278,850 idle persons reported April 1 to 248,560 on April 15.

To Confer on Training Business Student in Engineering and Engineer in Business

THE United States Commissioner of Education is calling a second public conference on commercial engineering on behalf of a committee on commercial engineering appointed by him to investigate business training of engineers and engineering training for students of business.

The conference will be held May 1 and 2 at the Carnegie Institute of Technology in Pittsburgh. The conference will be open to the public.

Owing to the timeliness of the subject, the conference in Pittsburgh will have even greater national significance than the first public conference on this question, which was held in Washington two and one-half years ago under the direction of this committee on commercial engineering of which Dr. Glen Levin Swiggett, of the Bureau of Education, is chairman.

The Pittsburgh conference will deal with the new problems that have recently arisen in modern industries, the solution of which demands a more scientific approach to include job analyses and personnel specifications and a translation of these into a new and teachable content for use in our engineering and commerce schools; with the training of the engineer for a better understanding of problems relating to community development, and with the training of the engineer for management of overseas engineering projects.

Among the members of the committee on commercial engineering are: John Hays Hammond, mining engineer, Washington, D. C.; E. M. Herr, president Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.; Samuel Insull, president, Commonwealth Edison Co., Chicago, Ill.; E. J. Mehren, editor, *Engineering News-Record*, New York; Francis C. Pratt, vice-president, General Electric Co., Schenectady, N. Y.

Unemployment Takes Big Drop

EMPLOYMENT figures during the past thirty days have shown a marked and continued upward trend in all sections of the country, according to a bulletin issued April 20 by the President's Conference on Unemployment, based on figures from the United States Employment Service. For every 100 jobs available, the announcement states, there are now 160 applicants, as against 226 in January.

In other words, where there was work for only 44 per cent of the seekers three months ago, there are now jobs for 62 per cent. Based on an estimate of 3,500,000 jobless, this means employment for 630,000 individuals. In January there were 38 applicants placed out of every 100. For the first week in April the number has gone up to 50.

President Harding Studies Activities of Federated Engineering Societies

WORK of the Federated American Engineering Societies was discussed April 11 when Mortimer E. Cooley, president of the Federation, and L. W. Wallace, its executive secretary, conferred with President Harding. The President showed keen interest in the organization and recalled the part which Secretary Hoover took in its formation.

Dean Cooley told the President that the Federated Societies would concentrate attention in the immediate future on reforestation, elimination of waste in American agriculture and industry, and on the reorganization of the Federal Government. The President's attention also was called to a list of the activities which have concerned the Federation since its founding seventeen months ago. These were handed to the President in typewritten form. Quite to the surprise of Dean Cooley and Mr. Wallace the President proceeded to analyze them on the spot. The list is as follows:

Investigation of industrial waste; participation in the settlement of jurisdictional disputes among unions of the construction industry; study of the relative merits of the eight-hour and twelve-hour shifts in continuous-process industries; actively supported Patent Office relief bill, topographic survey bill, business-cycle bill, railway transportation bills, and legislation providing a commission status for sanitary engineers of the U. S. Public Health Service; study of the Muscle Shoals and Great Lakes-St. Lawrence waterway projects; participation in the Unemployment Conference's investigation of business cycles; participation in the activities looking to the reorganization of the Federal Government's executive departments, including the bill providing for a Department of Public Welfare, and particularly proposals looking to the establishment of a Department of Public Works; participation in numerous conferences called by the Department of Commerce.

Garfield Opposes Public Ownership of Mines; Proposes Fact-Finding Bureaus and Advisory Commissions

DR. HARRY A. GARFIELD, president of Williams College and former Fuel Administrator, told the diners at the dinner of the Survey Associates, Inc., at the Hotel Astor, New York, on April 21, that he was not one of those who believe that public ownership ought to be substituted for private ownership of mines, and suggested a plan for the benefit of the coal industry which had been considered by representatives of the industry and mine workers at Washington early in 1919.

He said the plan as originally presented included all basic industries involved in feeding, clothing and housing the people and in transporting the necessary basic commodities. In presenting his plan regarding the coal industry he substituted the Secretary of Commerce for the Secretary of the Interior as originally suggested. His plan provides:

1. That two separate federal advisory commissions be established, each having to do with coal—a bituminous commission and an anthracite commission—representing the public, the mine workers and the operators.
2. That the Secretary of Commerce be designated as chairman of each commission, to act for the President as the representatives of the public.
3. That the mine workers be represented on each commission by, say, three members, chosen by and from their own group, and that the operators be represented by an equal number, chosen in the same way.
4. That these commissions have authority to require from the Federal Trade Commission, the Bureau of Labor Statistics of the Department of Labor, the Interstate Commerce Commission and the Geological Survey of the Interior Department all the facts necessary for the determination of policies.
5. That Congress be asked to appropriate sufficient funds to enable the Labor Statistics Bureau to have at all times ready at hand full information as to the cost of living of the mine worker; the Federal Trade Commission, all the facts regarding cost of producing and selling coal; the Interstate Commerce Commission, all the facts showing cost of distribution, and the Geological Survey, figures showing the supplies on hand in all sections of the country.
6. That these four fact-finding bureaus of the government have nothing to do with the determination of policies, their responsibility ending with an impartial ascertainment and presentation of the facts.
7. That the coal commissions, representing the public, the mine-workers, and the operators, have no power to determine policies but be purely advisory—advisory to the President of the United States, speaking through the Secretary of Commerce as chairman.
8. That upon the President of the United States shall rest the power to determine policies and to make such regulations as may be authorized by Congress upon his recommendations, the action of the President being in every case based upon the advice of the Secretary of Commerce, speaking with understanding as a result of his conference with the advisory commissions and his study of the facts submitted by the fact-finding bureaus.

Leading up to the question of public ownership of mines Dr. Garfield said he had been asked to speak of the interest of the consumer of coal and that he would undertake to do so in a spirit of tolerance and with a view to permanent results rather than to a settlement of the present controversy. He said that the suggestions he would offer were founded on experience rather than on theory, explaining that the experience came with the war.

"Who can doubt," asked Dr. Garfield, "that coal is a basic commodity and that it is charged with a public use; and this being so, it is equally obvious that those who are engaged in the production and transportation of coal, whether as labor or capital, are charged with public responsibility. This, it seems to me, is incontrovertibly true.

"But at this point opinion divides. There are those who believe that because of these facts the government should intervene even to the extent of owning and operating mines and railroads, and there are others equally insistent who believe that the best results are obtained under private ownership. Even if it were granted that the policy of nationalization of the mines would be the wiser one to adopt, the fact is that our present system is based on the private ownership of mines. Therefore it would be necessary to show how and by what practical means the mines could be taken over and operated in the public interest."

"Whoever owns it," said Dr. Garfield, "capital is indisputably necessary to the production and transportation of coal, and likewise whoever governs production and transportation, the labor of men's hands must be employed."

After saying that the public has no right to ask something for nothing and that the consumer of coal is not warranted in demanding that he pay less for the product delivered at his home or factory than shall represent fair profit, fair wages, a just return for transportation and a fair commission to those who perform necessary functions in the distribution of the product, Dr. Garfield said that what the public objects to is unfair profits, excessive wages, unnecessarily large freight charges and jobbers' and retailers' commissions being laid upon him, and this without the opportunity to be heard or the power to prevent.

Coal is no longer a private industry in the sense that some others are, said Dr. Garfield. "Mines are privately owned and operated," he said, "and I am not one of those who believe that we ought to substitute public ownership for the present system. This is my belief because I do not consider it necessary. It is not necessary provided those interested as operators and mine workers will co-operate with the government, representing the consumer, and agree upon a program of action calculated to secure just results to all concerned."

Dr. Garfield said the public is clearly at fault when it fails to co-operate with the producer of coal by distributing its purchases as evenly as possible throughout the year. Unequal demands have resulted in opening more mines than are necessary for the year's requirements, with consequent employment of more labor at certain periods than the industry needs. Until the public consents to co-operate with the industry in correcting this condition the public is not free from fault and therefore to an extent must consent to pay more than would otherwise be necessary for its coal.

Philip Murray, vice-president of the United Mine Workers, in his address suggested congressional action to end the existing strike at once, and a permanent commission to gather the facts and work out a permanent policy for the coal industry. He said the miners will declare the strike off and return to work pending the negotiation of a new agreement if Congress will pass a joint resolution or bill providing that the award of the Bituminous Coal Commission of 1920 be applied to all soft-coal operations, and the recommendation be made that the President call a national conference of the representatives of all operators and mine workers to negotiate a new agreement.

As to a permanent policy for regularizing production and stabilizing the industry, Mr. Murray recommended the appointment of a representative technical and official commission charged with the duty of collecting and analyzing all the facts and with making sound and appropriate constructive recommendations.

Mr. Murray's recommendations in detail are as follows:

1. Authorization by Congress and appointment by the President of a coal commission to ascertain all the facts as to the coal industry, including both anthracite and bituminous, and to report within one year, with findings of fact and constructive recommendations for placing the production and distribution of coal on a basis where the interests of the public, the mine workers and the operators would be permanently safeguarded and subserved. The United Mine Workers of America would welcome such an investigation and would extend to it their full co-operation.

As to the form of such a commission, it is my opinion that it should include within its membership all the government agencies dealing with coal, as well as representatives of all parties interested. The chairman should be some eminent and unprejudiced representative of the public. The members should consist of the chief of the Bureau of Mines, the chief of the Geological Survey, the chairman of the Federal Trade Commission, the chairman of the Interstate Commerce Commission, the Governor of the Federal Reserve Board, the Secretary of the Interior, the president of the National Coal Association, and the president of the United Mine Workers of America.

2. As a more immediate measure bearing upon the present stoppage of work, Congress should pass a law extending the award of the President's Bituminous Coal Commission of 1920 to all operators in the country, both union and non-union, this award to be universally observed until a national conference could be held and a new agreement as to wages and working conditions negotiated and accepted. The law should further provide that after the award of the President's Bituminous Coal

> Commission had been put into effect in all mining districts, the bituminous mine workers should return to work pending the negotiation of a new agreement.
>
> 3. After the award of the President's Coal Commission of 1920 had been applied throughout the country, and after the mine workers had returned to work, the President should summon a national conference composed of the representatives of the mine workers and of the operators from all districts for the purpose of negotiating a new agreement.

The application of the award of the President's Coal Commission of 1920 to both union and non-union fields would remove from the union operators the menace of the vicious competition of non-union operators and bring about uniformity in wages and working conditions. As soon as these conditions were brought about there would be no opposition to a national conference of operators and mine workers, and a new working agreement without doubt would be negotiated. The industry could then resume operations under favorable conditions and await the report of the Coal Commission as to constructive measures for the permanent solution of the more fundamental problems of over-expansion and irregularity of operation.

T. H. WATKINS PRESENTS OPERATORS' SIDE

Thomas H. Watkins, president of the Pennsylvania Coal & Coke Corporation, operating in central Pennsylvania, presented the operators' side of the coal situation. He denounced the policies of the miners' union and said that the operators of union coal mines in central Pennsylvania were between the devil and the deep sea, the union keeping wages and costs up and the non-union fields taking all the business with low-price coal. He set forth the position of the anthracite and bituminous operators generally throughout the country and challenged Mr. Murray to state what connection there is between the anthracite strike and the so-called broken contract of the Central Competitive region.

In answer to Mr. Murray's suggestion that the miners would go back to work for one year at the rate of wages in the last contract pending the finding of a commission, Mr. Watkins suggested the miners go back to work at the 1917 scale. This was met by hoots from a number of the miners' representatives scattered through the audience. Extracts from Mr. Watkins address follow:

"A partial answer as to what lies back of the coal strike is the natural desire on the part of the miners to secure better conditions of employment, as well as to enjoy more cultural opportunities and to have a larger share of the luxuries of our modern civilization. A complete answer would show sinister influences at work to secure complete domination of coal production by a union not responsible for acts that might seriously affect the public welfare.

"This strike has certain features connected with it which from a national standpoint present a grave menace to our present form of government; it has already stopped the production of about 70 per cent of a product upon which our present-day civilization absolutely depends. The stoppage of the balance is deliberately planned by the most powerful single unit of organized labor in this country; as, witness the methods pursued in efforts to organize the non-union fields—marching armies in West Virginia, intimidation, ostracism, and many other vicious forms of coercion.

"A great deal has been said about intermittency of employment and overdevelopment. There is intermittency of employment; there is overdevelopment in the bituminous industry. In addition, there is crying need for improvement in the way cars are distributed by the railroads. This is a condition which does not, however, affect all miners and operators unfavorably. In times of business activity the use of assigned cars and private cars gives a special advantage to certain mines, causing loss and distress at other mines.

"Another cause of intermittency and part-time operation in the union fields is well known to the leaders, and that is the competition from non-union mines, which have been developed to an unprecedented extent during the past five years, the result being that the non-union mines whose output is competitive in the Eastern and Atlantic Seaboard markets actually produced in 1921 106,000,000 tons as against an output of 55,000,000 tons from union mines. Significant as are these figures of non-union production, they are far below the potential capacity of the non-union mines.

"Reductions in wages have resulted in their being able to undersell the union operator, the union operator and miner either remaining idle or at best working on a few scattered orders. The union leaders realize that they must meet this competition or lose their followers, but before meeting it they are attempting to control the non-union fields in order to bring them up to the standard of wages they decide upon. Watch the campaign there! Is it not plain that an agreement which ignores that competition would be of no value to either the union miner or operator?

"Up to this time there has not been the slighest indication that the miners' leaders are willing to compromise their demands, nor at any time have there been any public utterances to indicate a willingness to bear any part of the burden of readjustment from war conditions which other workers have shown, and of which capital has been obliged to take the largest share. 'War to a finish against a reduction' is their slogan.

"A tribunal authorized by law to conduct a compulsory inquiry may be found to be the proper solution. Such a tribunal, if selected from prominent public-spirited citizens free from political ambitions, interested in supporting our present form of government and the liberties guaranteed thereunder, may eventually be the only method of giving the public the basis upon which it can form a definite and lasting opinion of the principle which must govern the production and distribution of the nation's coal resources.

"Such a commission could inquire into our present laws and make recommendations as to such changes as would stabilize the industry. The miner's only solution is six hours a day and five days a week, a minimum wage, and all miners in the union.

"The resort to such an official inquiry should not prevent the operators and miners from getting together and trying district negotiations. Long-range public discussions such as are now going on will get us no place.

"The public wants its Sherman laws and Clayton acts to prevent concerted action by employers. A certain amount of waste and confusion is bound to result from laws which prevent the operators from co-operating to improve the general conditions of their industry.

"Labor must suffer to some extent along with the operator and the public so long as these laws stand and prohibit constructive trade agreements."

End of Commerce Commission Deadlock on Freight Rates Not in Sight

DURING the past week it has been called forcibly to the attention of the Interstate Commerce Commission that the delay in handing down a decision in the freight-rate reduction case is having a serious bearing on the business situation. It is believed that the commission has been doing all within its power to expedite the disposition of this case, but the gradually increasing pressure for an early decision is expected to accelerate the straightening out of the snarl in which the commission finds itself. There are eleven members of the commission, but only four of these heard all of the case. The leadership in the diverging opinions within the commission is thought to come from this group of four.

Regardless of the pressure which is being exerted, the importance of the case is such that each Commissioner is being very careful of his ground. They realize that this decision will be the financial yardstick of the railroads for a considerable time to come. For that reason the chances seem to favor the further lapse of time before the announcement of a decision.

AS A LARGER APPROPRIATION will be available to the commodity divisions of the Department of Commerce after July 1 it is thought probable that separate divisions will be made of petroleum and coal. At present petroleum and coal are handled in one division, known as the fuel division.

Secretary Davis Restates Position of Labor Department on Coal Strike

SECRETARY DAVIS has written to W. A. Thomas, formerly president of the Brier Hill Steel Co., fully setting forth, as Mr. Davis notes in a letter to *Coal Age*, "all the pertinent information which has come to us and which should, in the interest of fairness to the department and its representatives, be made public," with respect to the present coal strike. Secretary Davis' letter, which is reproduced herewith in full, was in response to a letter from Mr. Thomas, dated at Youngstown, Ohio, April 19, 1922:

I have your kind letter of April 9, enclosing copy of Bulletin from *Coal Age* and directing my attention to an editorial appearing in the *New York Herald* of April 8, entitled "Secretary Davis' Strike Facts," later reproduced in *Coal Age* and now being circulated. I have not until now had time to give attention to this editorial, but your letter gives me a welcome opportunity to clarify the entire situation to you, as well as to send copies of my letter to you, to the *New York Herald* and to *Coal Age*.

I have no desire to be drawn into controversy with either side in this dispute, as my duties are conciliatory. I am ever mindful of what Lincoln once said, that if he stopped to answer every statement or misstatement regarding his acts, he would have no time left for important official duties.

I appreciate the real intent in your expressed opinion that I have always been favorable to labor. But I have always held that no one can be favorable and helpful to labor unless he also seeks to advance the interests of the employer. Hence I have always striven to devote myself as even-handedly as possible to the best interests of both employer and employee.

The editorial in the *New York Herald*, now circulated by *Coal Age*, quotes from a statement prepared by me for one of the newspaper services for Sunday, April 2. A copy of this statement is enclosed herewith. That quotation is taken as the basis for a criticism of my lack of fairness to the operators. The remainder of my statement to this news service is left unquoted. The result is that the piecemeal quotation is unfair to me.

Otherwise the *Herald* editorial questions my fairness with the assertion:

> "But Secretary Davis knows, for he has been so informed by an official letter from B. M. Clark, president of the Association of Bituminous Coal Operators of Central Pennsylvania, that on March 6, 1922, the association headed by Mr. Clark requested a conference with John Brophy, president of the United Mines Workers of America, District No. 2, for the purpose of negotiating a new scale, but that Mr. Brophy, the union leader, declined to have his scale committee meet the operators' scale committee until after a settlement should be effected between the United Mine Workers of America and the operators of the Central Competitive Field."

The editorial further asserts "that I knew this to be a fact because I had telegraphed Mr. Clark that my statement in regard to the attitude of certain operators had no reference to his association, but referred only to that section of the Central Competitive States which failed to comply with the New York agreement of March, 1920." This New York agreement was the basis used for wage agreements in all outlying districts. District No. 2, central Pennsylvania, where Mr. Clark is located, is one of these outlying districts, and his association was not a signatory to the New York agreement. Hence my aim was to secure a conference as provided in the New York agreement.

The issues in this controversy are vastly confused, but the straight road through them is this:

1. The Central Competitive States agreement, embracing Illinois, Indiana, Ohio and western Pennsylvania, was negotiated in New York City, March 31, 1920. It was in effect until April 1, 1922. The conference which negotiated this agreement was convened by the President of the United States for the purpose of writing into the agreement the wage award of the Federal Bituminous Coal Commission of that time, itself appointed by the President.

2. The New York agreement provided that prior to April 1, 1922, a meeting of representatives of both operators and miners should be held to arrange a place and time for working out a new two-year wage agreement.

3. It was the desire of the present administration that both parties to this New York agreement should meet in accordance with that written pledge, thereby discharging the obligations resting upon them under the terms of the agreement

4. The miners' officials who were parties to the New York agreement were willing and ready to go into conference as stipulated, but some of the operators declined to meet.

5. My contention was and is that the reasons set forth by some of the operators as to the futility of a successful meeting to negotiate a new wage agreement and their allegation of inability (on account of competitive conditions) to continue the four-state competitive agreement, should have been presented at a meeting called for in accordance with the New York agreement of 1920.

6. If this course had been pursued—if this preliminary meeting had been held—no one could have fairly stated that the obligations resting on all had not been discharged. If such a preliminary meeting had been held, a plan might have been developed that would have removed the obstacles which some of the operators declared stood in the way of negotiating a new two-year agreement covering wages and other matters.

As further evidence of my earnest desire to be fair in this matter, I am sending you herewith a copy of my statement to the press representatives on the eve of the strike, March 31, 1922.

My aim in this matter is to try to end this controversy to the satisfaction of all. I cannot succeed if I irritate feelings on either side; but I cannot help pointing out that my work is not aided by these attempts, from either side, to cloud the issue.

Since the receipt of your letter I have noted an editorial in the *New York Commercial*, reproduced by *Coal Age* of New York City, entitled "The Public and the Coal Strike," in which they call attention to the violation of Rule 25, which provides that a strike shall not be called for thirty days after the expiration of the agreement. This refers to the same Pennsylvania district mentioned in the *Herald* editorial, and is outside of the Central Competitive Field.

The miners' officials of District No. 2, central Pennsylvania, contend that Rule 25 was inserted in the district agreement in order to give the district time to negotiate an agreement after the basic rate had been set in the Central Competitive Field, and that if no negotiations were under way in the Central Competitive Field, Rule 25 did not apply. We are advised that the District No. 2 operators posted notice of a reduction in wages to be effective April 1, but, notwithstanding these contentions, I believe that prior to March 31 there should have been a joint conference as requested by the operators and in accordance with the district agreement.

I have been criticized by some of the bituminous operators for not calling to the attention of the public a violation of the agreement by the miners in Illinois, Indiana and Ohio in July and August, 1920, when strikes were precipitated by the day men for an increase in their wage rates. The facts as disclosed by the records are that beginning about July 20 and ending August 9, 1920, practically all of the mines in Illinois, many in Indiana, and some in Ohio were closed by a strike of day men for an increase in excess of the amount granted them by the award of the Bituminous Coal Commission, as the day men contended that they did not receive a fair proportionate increase in wages as compared with the miners in the commission's award. These local sporadic strikes, which affected directly and indirectly upward of 70,000 workers, were not sanctioned or called by the district or international officials of the United Mines Workers of America.

On July 21, 1920, representatives of the Illinois coal operators came to Washington and appealed to President Wilson to take action to check the spread of the strike, as they felt bound not to depart "except through governmental action" from the existing contract with the men based on the wage scale fixed by the Federal Bituminous Coal Commission.

The President referred the matter to the Department of Labor, and conciliators were assigned to Springfield, Ill., to put forth every effort to induce the men on strike to return to work and to prevent the strike from spreading to mines then at work.

On July 26 President Farrington, of the Illinois Mine Workers' Union, and his associates advised the conciliators that it was useless to attempt to have the men remain at work or to have men already on strike resume work unless they had assurance from the government that the day-wage question would be reopened for readjustment. They further stated that they could not prevail upon the men to return to work on account of statements made to them by mine foremen, superintendents and coal operators to the effect that the day men were entitled to a higher wage rate. It was a fact that coal operators were paying bonuses to many of the day men over and above the wages fixed by the Bituminous Coal Commission, and these bonuses were an extremely disturbing factor. (See testimony of Mr. P. H. Penna, secretary, Indiana Bituminous Coal Operators' Association, before Committee on Labor, H.R. April 7, 1922, page 353.)

On July 30, 1920, President Wilson issued a statement to the members of the United Mine Workers of America advising them that they were engaged in a strike in violation of the terms of the award of the Bituminous Coal Commission. He insisted that the striking mine workers return to work, thereby demonstrating their good faith in keeping their contract; and further, that upon their resuming work he would invite the scale committee of operators and miners to reconvene for the purpose of readjusting "any such inequalities as they may *mutually* agree should be adjusted."

President Lewis, of the United Mine Workers of America, insisted that the strikers return to work. After work was resumed President Wilson called the joint scale committee of the operators and miners of the Central Competitive Field to meet in Cleveland, Ohio, Aug. 13. The conference met on the day set. The four districts comprising the Central Competitive Field were unable to agree as a unit on the amount of increase to be granted to the day workers, but a satisfactory disposition of the matters in dispute was reached by the miners and operators of each state separately.

The fact that the operators and miners did meet in joint conference and did *mutually* agree to readjust the day wage rates would seem to establish the fact that there was no impairment of the agreement, nor did it abrogate the obligation of the operators and miners to meet in preliminary conference prior to March 31, 1922. This is evident because in all matters except the *mutually* agreed-to increase to the day men both operators and miners continued to operate under the terms of the New York agreement for twenty months thereafter.

I am indeed grateful to you for giving me the opportunity to set forth the situation as we see it in the Department of Labor, and I welcome any suggestions you may desire to offer concerning the subject matter, because I know they would come from a man who wants to be fair and do the right thing by his fellow men.

Coal Retailers Will Hold Fifth Annual Convention in Chicago, May 18-20

THE fifth annual convention of the National Retail Coal Merchants' Association will be held at the Drake Hotel, Chicago, May 18-20. Among the topics suggested for discussion during the convention are the following: Trade functions; whether any other trade association is organized along lines which would suggest an improved basis of organization or methods of operation; is the retail coal trade serving the public efficiently in the selection of available fuels?; legislation; public fuel yards; fuel standards; should the net ton be generally adopted in the coal business?; investigations in relation to the retail coal trade; ethics of the coal business.

ATTORNEY GENERAL DAUGHERTY has suggested that an association of coal consumers be organized along lines of other national organizations to protect the interests of coal consumers in strikes or other stoppages of production.

Secretary Hoover Opposed to Increase in Freight Rates on Bunker Coal

SECRETARY HOOVER is opposed to any increase in the freight rates on bunker coal and has written the Interstate Commerce Commission to that effect. The commission has been investigating the relations of rates on bunker coal to rates on cargo coal for local harbor delivery. After briefly stating the quantities of coal at various Atlantic ports loaded for bunkers as compared with that used locally he states:

> The people of the tidewater cities have not complained against present bunker rates, and, in fact, at nearly all ports the local interests have gone on record as being opposed to any raise in such rates, as against the development of their port.
>
> Lower bunker rates are not a discrimination as against local rates. The steamship owners must pay trimming and barging charges, which more than make up for the difference. At Norfolk, for instance, there is a difference between the local rates and the rate on bunker coal of 14c. per ton, but trimming charges are 30c. (sometimes more) per ton, so that the steamship owner really pays 16c. more per ton than do the local buyers.
>
> Even at present rates and prices ship owners are finding it more profitable to bunker for the round trip at European Atlantic ports, or, in some cases, are bringing coal to this side in ballast, to be used as bunkers, in preference to bunkering at our ports.
>
> If bunker rates are increased it will mean an addition to the cost of coal at New England and other ports that receive their coal by water, as the added cost of bunkers will be charged to the water transportation cost of coal and be paid by the consumer. Moreover, such an increase would necessitate an entire readjustment of rail rates to New England; otherwise the volume of coal that would move into New England by rail would be greatly increased, and the already overburdened railroad facilities would be still more inadequate.
>
> Our coal exporters are now making strong efforts to increase our foreign trade and the bunker business that would inevitably go with it. An increase in the cost of bunker coal would seriously handicap their efforts and drive business to our foreign competitors. Today the latter are closely watching the coal situation here and are prepared to do their utmost to take away our foreign bunker trade, as is evidenced by numerous inquiries received and statements made by foreign coal interests.
>
> Our steamship bunker business is now at its lowest point in eight years, due in part to the competition of oil fuel, but also to the increased cost of bunker coal on this side and the strong efforts made by our British competitors to take this trade away from us.
>
> I should like in closing to submit the following statements for your consideration: That there is, in general, a distinct difference between the transportation service given coals for local delivery and that given coals for ship use, to deliver a car of coal locally involving more service which should be reflected in the transportation charge; that there is no competition locally between coal for local use and coal for ship use, as the latter is not burned at the port; that any rate on bunker coal is a proportional and not a local rate; that there is nothing to prevent cargo coal being used as bunkers; and that this, in fact, is often done; that any change in existing differentials would have the effect of destroying our whole coastwise and overseas system of rates based on the custom of many years.

Coal Output on Federal Lands in 1921 Fell 13,070,000 Tons from Previous Year

PRODUCTION of coal under the Coal Land Leasing Act is summarized in a report to the Bureau of Mines as follows:

Data show that production for 13 Western States reached a maximum of 40,680,000 tons in 1920, a war year, and that the output dropped to 27,610,000 tons in 1921, another abnormal year. The figure last given is appreciably less than the production for 1907. The average annual production for the next five years is estimated at 32,000,000 tons. While a normal growth justifies that figure, the uncertainty of conditions is recognized.

Prior to March 1, 1922, the U. S. Geological Survey had acted on 480 applications for coal prospecting permits and 122 applications for coal leases, and the General Land Office had issued 162 permits and 18 leases. The production in 1922 of the leases issued will be about 500,000 tons and should reach 3,000,000 tons by 1925. Of the new leases to be issued, probably 50 will develop into important producers from which 5,000,000 tons may be expected by 1926. The small mines developed by the small operator will produce for the local market and will not have any material influence on the coal market.

On this basis, the total production from government land will reach 8,000,000 tons by 1926, 5,000,000 tons from extensions of existing mines and 3,000,000 tons from new developments. Total production from the Western field, estimated at 32,000,000 tons, probably will be reached in this proportion, as the large operator will hold his fee coals as a reserve, maintaining and increasing his production from government lands. A study of the 18 leases issued shows that they cover an area of 14,444 acres, of which 8,430 acres are extensions to going mines and 6,014 acres in new developments. About 12,000 acres will be added to going mines by the 50 important leases in prospect, and about 14,000 acres will be new operations.

Of the 162 prospecting permits issued, covering an area of approximately 160,000 acres, not more than 25 or 50 acres will develop into important leases and the production from this source will not exceed 2,500,000 tons by 1928. In many instances the prospecting permits are purely speculative. The market in certain areas is limited and a most optimistic view cannot justify extensive developments.

One of the most interesting developments in coal leasing is that practically all of the important producing companies in the West have either leased, made application for lease, or contemplated making application in the near future. As the scope of the law and the departmental attitude is better understood the activities will increase and increased interest will be shown by the entire coal industry.

Idle Freight Cars Increase 52,859, Due Principally to Coal Strike

DUE almost entirely to a falling off in the demand for coal cars because of the strike of miners, freight cars idle on April 8 because of business conditions totaled 420,546, compared with 367,687 on March 31, or an increase of 52,859 cars. These figures are based on reports from the carriers to the Car Service Division of the American Railway Association.

Of the total, 259,605 were surplus cars, that is cars in good repair but in excess of current freight requirements, while the remaining 160,941 were cars in need of repairs in excess of the normal number unfit for service. Surplus coal cars totaled 122,359, an increase of 49,793 compared with the total on March 31. Surplus coke cars numbered 2,229, a decrease of 606 within the same period.

New York Syndicate Acquires Schlesinger Interests in Wisconsin and Illinois

A REPORT that a syndicate of New York bankers has acquired the Schlesinger interests in Wisconsin and Illinois, at a price of approximately $7,000,000, has been authoritatively confirmed in Milwaukee. The estate of Ferdinand Schlesinger—who died about a year ago—owned 57 per cent of the properties.

The North American Co. will participate in the underwriting to the extent of $2,000,000. Financial interests in Milwaukee and New York also will be interested. Armin A. Schlesinger will continue as one of the managers of the syndicate. The other managers will be Mr. Dillon of Dillon-Read Co., and Harrison Williams, both of New York City. The concerns involved in the deal are the Milwaukee Gas & Coke Co., the Semet-Solvay Coke Co., the Newport Co. (embracing the Newport Chemical Works at Carrollville, Wis., and the Newport iron mines) and the Steel Tube Co. of America, with plants in a number of cities. The company controls 228 byproduct coke ovens, with an annual capacity of about a million tons of coke.

JUST NOW AN important kind of 100-per cent Americanism consists in meeting business 100 per cent of the way.—*Boston Herald.*

DESIRE FOR NATIONALIZATION OF MINES should not blind socialists to the need for nationalization of minds.—*Norfolk Virginian-Pilot.*

Third Week of the Coal Strike

EDITORIAL REVIEW

ALL of the initial tendencies of the strike were intensified further during its third week. The indifference of consumers was more marked. Unbilled coal on tracks reached a total of 1,500,000 tons on April 8, and at this writing had decreased but slightly. Coal continues to be consumed at the rate of 5,000,000 tons per week in excess of production. The country is approaching the end of its reserve at a more rapid rate than anyone had calculated. The draft on coal stocks is twice as great as had been predicted.

To the operators, one of the disquieting features of the situation is the steady progress being made by representatives of the United Mine Workers in non-union territory of central Pennsylvania. The fear is expressed that the union may be able to annex this territory permanently. The additional mines which have closed in central Pennsylvania, however, are more than offset by those which have opened in northern West Virginia, but the strategic value to the union nevertheless remains an important one.

The demand for certain types of coal has increased, but throughout the whole southern Appalachian region the great problem is that of no market. There is one feature of that situation which is favorable to the operators in that it has discouraged speculation and has prevented any flurry in prices.

Observers in Washington believe that if there was any possibility of a national meeting between operators and mine workers, it has been dissipated by the latest statement of Attorney General Daugherty. Since he does not name the illegal things which he seems to believe have been taking place at former meetings, operators would be less inclined than ever to enter into a conference without definite knowledge as to what would be regarded as illegal.

Farmers in Pennsylvania are understood to be preparing to open their wagon mines so as to be in a position to produce immediately if prices should reach levels high enough to permit them to operate.

Much interest is manifested in Washington in the statement that the anthracite operators are preparing to lay their case before the public.

Figures being prepared by F. G. Tryon, coal statistician for the Geological Survey, show that the Central Competitive Field in 1921 was furnishing practically the same proportion of the country's tonnage that it furnished in 1890.

Geological Survey Production Forecast for Third Week Likely to Be Surpassed

PRODUCTION in the third week of the strike was forecast by the Geological Survey as less than in either the first or the second week. The Survey forecast, however, was based on loadings up to last Thursday and there were marked gains in a number of fields on Friday that are now expected to raise the total for the week to that of the second week, or about 3,600,000 tons.

Production in the Somerset region was further curtailed in the week of April 22, as additional non-union mines were closed on the Baltimore & Ohio R.R. Loadings on this road were thus lower than in earlier weeks, despite the fact that in the Fairmont region gains in production were recorded. The South Fork district, on the Pennsylvania R.R., which adjoins the Somerset district, on the Baltimore & Ohio, was practically closed.

Thursday, April 21, was the best day in three weeks for production in Maryland and the Upper Potomac field, where a number of mines are working with depleted but gradually increasing forces.

In southern West Virginia the New River field is maintaining production at half normal, loading around 200 cars per day (including those from mines on the Virginian served jointly by the two roads), compared with 400 cars per day a year ago. The Winding Gulf field is operating as full as orders for coal will permit.

Eastern Kentucky is booming. Demand for high-volatile coals off the Louisville & Nashville and Chesapeake & Ohio reached a peak in the third week of April. Prices mounted rapidly and output increased correspondingly. Loadings on the Louisville & Nashville were from 50 to 100 per cent over those of a year ago.

Alabama and the South generally appears to be little affected. Production of coal in southwestern Virginia, Tennessee and Alabama is approximately as great now as in April a year ago.

The United Mine Workers claim to have 80,000 non-union miners on strike and in a statement given to the press on Monday, April 24, predict that they will add 25,000 more this week.

The New York *Journal of Commerce* on Tuesday printed a story to the effect that the Department of Justice, through the Bureau of Labor Statistics, was actively inquiring into price advances and that the government has intimated to the non-union operators that "any development of a runaway market would alter overnight the 'hands-off' policy maintained by the administration since April 1, after all its efforts to induce operators and miners to confer in advance of the walkout had proved futile."

House Labor Committee Holds Hearings On Bland Coal Commission Bill

HEARINGS are being held on the Bland bill to establish a commission of inquiry for the coal industry. The House Committee on Labor, which is conducting these hearings, on Thursday, April 20, heard Nelson B. Gaskill, chairman of the Federal Trade Commission. Mr. Gaskill recited the difficulties the commission has had in establishing its right and power to require certain cost data from the coal and steel industries, and suggested that should the courts decide adversely to the commission in the injunction proceedings which now stay the commission in its efforts to require these data, Congress should restate its intent and make clear the powers of the government in this connection.

Chief Counsel P. J. Farrell, of the Interstate Commerce Commission, who has had many years' experience with rate matters involving the collection of railroad statistics, expressed doubt as to the power of Congress to take the steps proposed in the Bland bill. Mr. Gaskill took the broad position that the collection of information is not regulation of commerce, that the mining of coal is charged with public interest, and that the coal industry is a proper subject of inquiry by Congress in the public welfare.

Mr. Gaskill insisted that the creation of an independent investigating body such as contemplated in the Bland bill is a "thing the coal industry needs above all else." He said the place "where the knot is to be untied is in the field of distribution, involving transportation." He opposed integration in the coal business if such integration were concealed, such as by secret, bogus independent and subsidiaries of the operating companies. If integration is to be allowed it should be in the open.

On Monday, April 24, three witnesses representing the miners were heard by the committee. J. P. Luterancik, of District No. 5 of the United Mine Workers, complained against the "rude and rough" methods of the coal and iron police and of the state constabulary of Pennsylvania in dispersing peaceable assemblages of miners. He also testified that striking miners had been refused citizenship papers by Federal Judge Orr of Pittsburgh.

J. D. A. Morrow, vice president of the National Coal Association, representing a majority of the producers of bituminous coal, was scheduled to testify on Tuesday, April 25. His testimony followed a general plan laid down by Mr. Bland and covered mine prices of coal, costs of production, freight rates, and other items entering into the ultimate price to the consumer. Mr. Morrow emphasized the disintegrated character of the bituminous coal industry, the large number of mines and of individual producers, the highly competitive nature of the market into which the products of these mines are sold, and made a conclusive showing of the lack of any combination among bituminous operators to restrict the production of soft coal or to fix prices.

He pointed out that the market price of bituminous coal tends to be established by the low-cost production section of the industry and not by the higher-cost producing mines. He cited the great variety of coals that are bought and sold in every large consuming center and emphasized the variation in mine prices not only for the coals from different fields but for the different grades of coal from the same mines in any one market at any one time. He quoted spot prices for bituminous coal in the Chicago market from the current issues of the *Chicago Journal of Commerce* and introduced into the record the annual average realized values for bituminous coal as reported by the Geological Survey for many years.

As indicative of the general level of the current price of bituminous coal Mr. Morrow cited the *Coal Age* index of spot prices for bituminous coal at the mines, which index, he advised the committee, "is generally recognized in the trade as being as accurate a representation of general price levels and changes in the industry as it is possible to obtain."

Mr. Morrow described for the committee the physical conditions surrounding the production of coal and pointed out that the largest single item of expense is labor, as represented by the payroll, which accounts for 65 to 70 per cent of the total cost of production.

Anthracite Operators Fail to Announce Expected Demand That Wages Be Cut

There was no announcement last week by the anthracite operators of what their wage demands are to be. Several of the minor demands of the mine workers were discussed by the joint conference in New York, among them demand No. 12, asking that where jackhammers are necessary and are of advantage in the work they be furnished free of charge to miners.

The discussion at the conference on April 20 centered upon the demand asking for the establishment of the regular mine wage scale for employees of stripping contractors and asking that all men at all collieries be given an opportunity to work full time.

The action of some of the mine workers on strike in Pittston, Pa., in seeking work on the streets of that city, thereby reducing the working hours of the men regularly employed at that work, also received attention at the New York meeting. The matter had been taken up at a meeting of the general grievance committee of the Pennsylvania Coal Co. miners held in Pittston on April 17, which went on record as condemning the action of the miners who took such jobs. An investigation was ordered. Alexander Campbell, chairman of the grievance committee, who also is a member of the scale committee, said the matter had been adjusted.

Samuel D. Warriner, chairman of the anthracite operators' policy committee and spokesman for the operators, issued a statement on Friday, April 21, from which the following is taken:

"We have informed the representatives of the anthracite miners, with whom we have been in conference since March 15, that it was our firm conviction that wage and other demands which would result in an increase in the price of coal could not be granted. On the contrary, our attitude, as stated to the miners' representatives, was that there must be a substantial reduction in wages.

"Developments since these negotiations began have served only to confirm the opinion already expressed by the producers of anthracite that the price was too high. Not even suspension of production has served to stimulate sales. We are faced by the very practical difficulty that the consumer will not pay the price for coal that we are required to ask in order to maintain even the present labor costs.

"We continue to be hopeful that the representatives of the miners will appreciate the fact that they alone among all the workers in the country cannot expect to retain wages that are even higher than the highest war-time rates.

"Actual hourly earnings for industrial workers from July, 1914, to June, 1921, increased 113 per cent. Railroad workers in the same time had increased their actual hourly earnings 169 per cent, but the anthracite workers were receiving actual earnings representing an increase of 167 per cent. Subsequent to October, 1921, the average hourly earnings of railroad workers decreased to 131 per cent, while in anthracite mining the average hourly earnings were still 100 per cent above 1914. Hourly wages for manufacturing industries are not available later than June, 1921.

"We think it must be obvious that this situation cannot be maintained, and it is on that basis that we have informed the representatives of the miners that a reduction in wages must be made such as will bring the scale paid in this industry into line with wages in other industries and permit a reduction in the price of coal to the consumer."

No Peace Moves in Middle West; Operators Prophesy Long Strike

Another week has passed without a single move having been made in the Middle West to end the miners' strike. Disturbances in the mining fields were few and slight. The only interesting things of the week were declarations by presidents of two operators' associations that the strike obviously cannot end before July 1 at the earliest and probably not then.

H. C. Adams, president of the Central Illinois Operators' Association, points out that the miners have not shown any sign yet of wanting to come to terms and that if the government continues to keep its hands off they probably will not display any such sign for some time. In case mine leaders finally decide that state negotiations were the best that could be obtained and in case they made overtures soon for such negotiations, it would be close to the end of May before conferences could begin, for the operators, he says, have a good deal of work yet to do before they could enter a wage meeting. And once begun, nobody can guess how long such meetings would take.

"The average man," says Mr. Adams, "has no idea how complicated the problems existing between miners and operators are. There are all sorts of ramifications to each one of a long list of disputable points. There would be a long fight over every one of them, no doubt."

W. K. Kavanaugh, president of the 5th and 9th Districts Operators' Association, in an address to the Manufacturers' and Merchants' Association of St. Louis made practically the same prediction about the length of the strike. It can hardly be settled before July 1, said he. Miners have recently received big wage payments and are by no means in the mood yet to talk of giving up their four-state agreement plan. Until they get into that mood. Mr. Kavanaugh believes, the public should consider well the attitude it takes toward the strike.

"The support of the public," said he, "in whatever way it may be feasible to give it for a quiet, sane, businesslike handling of the situation, avoiding hysterics and panic, is necessary to the people's future welfare as well as that of the coal industry."

Speaking of the miners' hope for government control of mines he said: "No sort of government regulation or control could increase the consumption of coal to provide work for these thousands of men. The regulation must be of forces outside of the coal industry rather than regulation of the coal industry. Coal does not control business activity; it is affected by business activity. The only time it controls business activity is when there is insufficient production of coal at points of consumption. This insufficiency of coal has never been due to lack of efficiency on the part of the management of the coal properties. It has always been due to transportation difficulties or to strikes on the part of labor. This labor question the government is no more able to settle permanently than is the coal operator."

E. W. D.

West Virginia Injunctions Modified

ON an appeal from the decision of Judge McClintic, of the U. S. Court for the Southern District of West Virginia, requiring the United Mine Workers to abandon the tent colonies in Mingo County, Judge Knapp, of U. S. Circuit Court at Richmond, reversed the lower court. The following quotation from the Circuit Court's decree indicates the extent of modification of the original:

> The said injunction decree is not suspended in so far as it restrains the defendants from interfering with the employees of the plaintiffs or with men seeking employment at the mines by means of threats, violence or injury to them or their persons, families or properties or accusing them or their families, or doing them violence in any manner whatsoever, or by doing other acts or things that would interfere with the rights of such employees and those seeking employment to work upon such terms as to them seem proper, unmolested, and from in any manner injuring or destroying the property of the plaintiffs or either of them, or from counseling or advising that these plaintiffs should in any way or manner be injured in the conduct or management of their business and in the enjoyment of their properties and property rights.
>
> Said injunction decree is not suspended hereby in so far as it enjoins the defendants and each of them from trespassing upon the property of the plaintiff or from inciting by intimidation the employees of the plaintiff to break their contract of employment with the plaintiff.

This decision was handed down on April 18. On April 17, after hearing arguments on the question of making the Winding Gulf injunction permanent, Judge McClintic at Charleston continued this injunction in effect for another ten days in order to pass upon it as well as others which are set for hearing on April 24.

Contracts Reported in Force Now in All West Virginia Non-Union Fields

THERE are said to be in effect now non-union contracts between the operators and miners of virtually all of the non-union fields of West Virginia, the wording of all such contracts being similar. Non-union contracts were consummated about two years ago between the operators and miners of the Pocahontas field, but of late operators and their employees in other non-union fields are said to have entered into similar contracts. To prevent any interference with these contracts injunctions have been obtained. These contracts usually read as follows:

"That so long as the relation of employer and employees exists between them, the employer will not knowingly employ or keep in his employ any member of the United Mine Workers of America, the I. W. W. or any other mine-labor organization, and the employee will not join or belong to any such union or organization and will not aid, encourage or approve the organization thereof, it being understood that the policy of said company is to operate a non-union mine; that it will not enter into any contract of employment under any other conditions.

"If and when said relation of employer and employee, at any time and under any circumstances, terminates, the employee agrees that he will not then or thereafter in any manner, molest, annoy or interfere with the business, customers or employees of the employer, and will not aid or encourage anyone else in so doing."

This contract is based on the contract granted in the case of the Hitchman Coal & Coke Co., which was adjudicated by the U. S. Supreme Court, on the strength of which the Pocahontas operators obtained an injunction from the West Virginia Supreme Court in 1920, still in effect.

DURING DEBATE IN THE SENATE on the Edge resolution for a Congressional commission to investigate trade associations, Senator Stanley of Kentucky, who a decade ago investigated the Steel Corporation when he was a member of the House and chairman of a special committee, said there is no truth in the charge that the Steel Corporation has formed a coal trust.

Committee of 48 to Report on Bituminous Coal Strike in Interest of Public

ADDITIONAL reports on the bituminous coal strike may be expected soon from the Committee of Forty-eight's National Bureau of Information and Education, according to an announcement made by that bureau. The various surveys so far made, the bureau says, have been made in the interests of either the operators or the miners. The general public has been neglected and as it is the party in the controversy most seriously affected, this survey has been undertaken.

The announcement says that the bureau was instituted for the purpose of informing the voting citizens of vital facts in American life. No other organization of its kind exists. No other political party has endeavored to so serve the voting public. It is in pursuance of this policy of service to the public that the study of the coal strike is being made. The price of coal to the purchaser is the important fact in the coal strike. The reasons for the excessive prices are the things which the bureau seeks to find out.

As a result of a request sent out to a large number of citizens, a questionnaire has been prepared which in a general way covers the desire on the part of the public for information on these matters. This questionnaire covers the cost of production, wages paid miners, working hours of miners, what governs the selling prices, the amount of coal produced per year, the amount of coal it is possible to produce and the question of car shortage.

Out of about 100 suggestions made, more than 90 per cent urged the formation of a permanent commission on coal, the announcement says.

J. A. Hopkins, executive chairman of the Committee of Forty-eight, has gone to the coal fields to make a study of conditions and in addition the bureau has sent a questionnaire covering the general situation as outlined to the following: Bureau of Labor Statistics, Geological Survey, Berwind-White Coal Mining Co., Philadelphia & Reading Coal & Iron Co., D. L. & W. Coal Co., Pittsburgh Coal Co., Bureau of Applied Economics, Secretary of Labor W. Jett Lauck, Russell Sage Foundation; Pennsylvania Coal Co., Lehigh & Wilkes-Barre Coal Co., Coxe Bros. & Co., Hillman Coal & Coke Co., Federal Trade Commission and the Lehigh Coal & Navigation Co.

Miners Attack Legality of Treason Trial

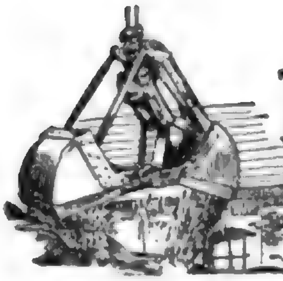
TWENTY-THREE officials and members of the United Mine Workers of America were placed on trial at Charles Town, W. Va., April 24, for treason before Judge J. M. Wood in Circuit Court. The defendants were charged with "traitorously levying war against the State of West Virginia," the trial being held in the same little court house where John Brown, noted abolitionist, was tried and convicted for his insurrection at Harper's Ferry, more than sixty years ago.

These men, who included high officials of the miners' union in West Virginia, were selected by the prosecution as the first to be tried of more than 700 men who are under indictment for treason, murder, conspiracy, inciting to riot and various other crimes, in connection with the march of armed miners last autumn on the non-union Logan and Mingo County coal fields.

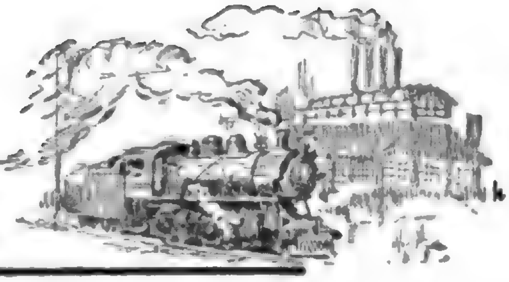
Whether the trial will proceed or be quashed in its beginning, however, rests with Judge Wood, who was expected to hand down a decision promptly on the demurrer submitted by counsel for the defense, contending that the treason indictments are invalid.

U. S. Chamber of Commerce to Study Coal

COAL will be a subject of consideration at the annual convention of the U. S. Chamber of Commerce, in Washington, May 16 to 18. The coal industry in relation to the public, the value to the public and the coal industry of uniform grades, storage and better methods of handling coal carrying equipment will be among the topics.



Production and the Market



Weekly Review

LAST week's flurry in the bituminous market is subsiding. Interest at first centered around Pittsburgh, where an active demand existed, with high-volatiles leading the list, due to the urgent fuel needs of the Steel Corporation. The call soon spread to other steel companies and to low-volatile coal, the prices of which soon reflected the better market. So much tonnage became immediately available that cancellation orders are now forthcoming and coal has lost its top-notch quotations of last week.

Coal Age Index of spot prices of bituminous coal rose to 206 on April 24, a gain of 22 points from the previous week. This gain was mainly the result of price increases in eastern Kentucky and southern West Virginia high-volatile coals and in all grades of central Pennsylvania low-volatiles, now becoming scarce.

With the edge off the demand from the steel makers the market is in a precarious position. The general industrial situation is improving slowly but reserve piles are being utilized and consumers are not interested in the prices now being quoted. Spot coal is now being bought at concessions on current quotations. Public utilities and railroads are taking a satisfactory tonnage, but this has little bearing on the spot market, as most of it is on long- or short-term contracts.

Dwindling Stocks Make Middle West Uneasy

In the Middle West stocks are dwindling and consumers are feeling a little uneasy, as indicated by a growing number of inquiries. Eastern coals are not so plentiful following the inroads made by steel-mill orders. Domestic coal is difficult to sell and the many no-bills of lump in southern Illinois are being worked off very slowly. Mine-run and steam grades are on a price par with domestic coals in the non-union producing regions supplying the territory.

There is no trade awakening in the Northwest. Dock shipments are light and price cuts, made to stimulate business have had little effect. Dockmen are becoming uneasy lest some of their stocks be on hand when the strike is settled. About 500,000 tons of coal are in Lake vessels and 3,000 cars (about 150,000 tons) are at the lower ports awaiting dumping. With this reinforcement to dock stocks, consumers are not at all apprehensive of a shortage and are not buying in excess of current needs.

North Atlantic market prices have been held up by the shortage of Pennsylvania coals and by heavy buying orders of shippers who are replacing non-union tonnage unexpectedly cut off by the strike. Spot demand has not increased materially and the heavy receipt of Southern coals by water has turned the rising tide of prices.

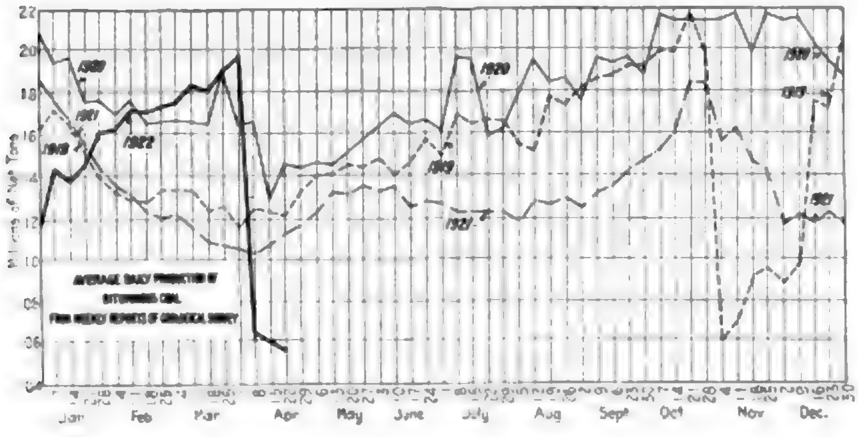
Anthracite markets are at a low ebb and while the mines in the hard-coal region are all idle, there is little interest being manifested in the situation. Householder demand is low, as is usual for this season of the year, and retail dealers express the hope that their stocks will meet requirements until replacements are obtainable.

Coke is virtually inactive. Production in the Connellsville regions has been so curtailed that the tonnage offering is negligible. The strike of the non-union miners has lost much of its impetus and producers feel that slow gains in output will soon be apparent.

BITUMINOUS

A decrease in the production of bituminous coal marked the second week of the strike, according to the Geological Survey. The revised figures for the week of April 15 are 3,675,000 tons of bituminous coal and 6,000 tons of anthracite, a total for all coal of 3,681,000 tons. In the second week of the 1919 strike the production of soft coal was 4,024,000 tons and of anthracite, 1,860,000 tons, a total for all coal of 5,884,000 tons. The current output of hard and soft coal combined is, therefore, some 2,000,000 tons short of that in the corresponding period of the 1919 strike. The Survey says:

"Telegraphic reports for last week (April 17-22) indi-



Estimates of Production

(Net Tons)

BITUMINOUS		
Week ended:	1922	1921
Apr. 1 (*b*)	10,469,000	5,822,000
Apr. 8 (*b*)	3,835,000	6,120,000
Apr. 15 (*a*)	3,675,000	6,528,000
Daily average	613,000	1,088,000
Calendar year	136,798,000	113,352,000
Daily av. calendar year	1,545,000	1,281,000
ANTHRACITE		
Apr. 8	9,000	1,865,000
Apr. 15 (*a*)	6,000	1,885,000
Calendar year	21,792,000	26,247,000
COKE		
Apr. 8 (*b*)	175,000	78,000
Apr. 15 (*a*)	149,000	74,000
Calendar year	2,133,000	2,701,000

(*a*) Subject to revision. (*b*) Revised from last report.

cate again no change in anthracite and a further decrease in the output of soft coal. The observance as holidays of Easter Monday and of Tuesday curtailed production sharply. By Thursday, however, daily loadings had risen to 11,040 cars, about the same as on the corresponding day of the two weeks preceding.

"Lack of demand remains the limiting factor in most of the non-union fields. During the week under review a number of additional non-uion mines were closed by the strike, but from those districts as yet unaffected reports of 'No market' continue to be received. The number of loaded cars unconsigned at the mines is still large, though now decreasing. More coal could be produced if the demand increased.

"Consumption is being met largely from storage. At the present rate of output the draft upon consumers' stock piles is not less than 4,000,000 tons a week. When the strike began, the accumulation at the mines of unbilled cars loaded with coal was large. Reports from the principal coal-carrying roads indicate that the average daily number of coal loads unconsigned was as follows:

UNBILLED CARS OF COAL AT THE MINES

Week ended	Cars Bituminous	Cars Anthracite	Total Cars
March 4	14,126	1,548	15,674
April 1	28,867	2,506	31,373
April 8	30,730	2,815	33,545
April 15 (preliminary)	26,790	1,655	28,745

"It will be seen that the number of unbilled loads of soft coal is declining slowly and that the unbilled loads of anthracite have now been reduced to about the level of early March."

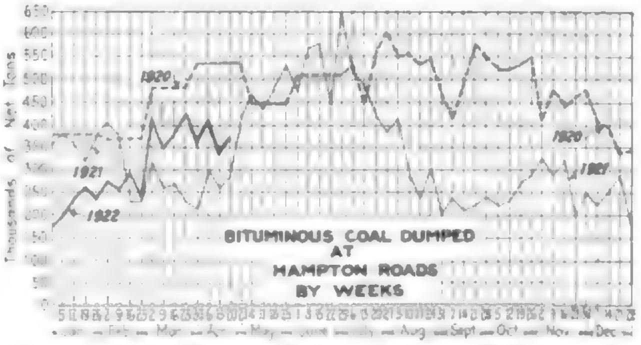
All-rail movement to New England has decreased sharply since the strike began. Pennsylvania quotations show a sharp increase, but only because of heavier demands from other sections and because of curtailed production. At New England the market for these coals is dormant as it was prior to the strike.

CARS OF COAL FORWARDED OVER THE HUDSON TO EASTERN NEW YORK AND NEW ENGLAND *a*

	1922		1921	
Week ended	Anthracite	Bituminous	Anthracite	Bituminous
April 1	3,406	3,118	2,493	2,771
April 8	2,702	2,130	1,867	2,526
April 15	966	1,365	2,724	2,474

(*a*) Figures furnished by courtesy of the American Railway Association.

Hampton Roads dumpings for all accounts was 367,892 net tons during the week ended April 20, as compared with 342,788 tons in the preceding week. Exports took some additional tonnage, but the bulk of the coal dumped went to New England, even though that market was saturated with Southern coals. Low-volatile prices at the Roads were firm, however, the weakness being displayed at Boston, where distress cargoes sold off to avoid demurrage. Demand for high-volatile coals was the feature of the week at Hampton Roads and prices exceeded those for Pool 1.



A total of 3,357,000 net tons was dumped over the piers at the five Atlantic coal ports during March. Shipments to New England totaled 1,384,000 tons. Exports were only 255,000 tons.

TIDEWATER BITUMINOUS COAL SHIPMENTS FOR THE MONTH OF MARCH, 1922 (*a*)
(In net tons)

Destination	New York	Phila-delphia	Balti-more	Hampton Roads	Charles-ton	Total
Coastwise to New England	116,254	47,962	59,073	1,160,787	....	1,384,076
Exports	1,323	26,416	34,124	177,697	15,659	255,219
Bunker	341,161	50,073	26,195	190,695	3,780	611,904
Inside capes	....	225,268	98,897	23,612	....	347,777
Other tonnage	617,452	3,499	17,089	120,132	....	758,172
Total	1,076,190	353,218	235,378	1,672,923	19,439	3,357,148

ANTHRACITE

Production of hard coal is practically nil. The second week of the strike saw only 112 cars af anthracite loaded, all of which was steam sizes dredged from the rivers. With the exception of this output—approximately 6,000 net tons—the industry is at a standstill.

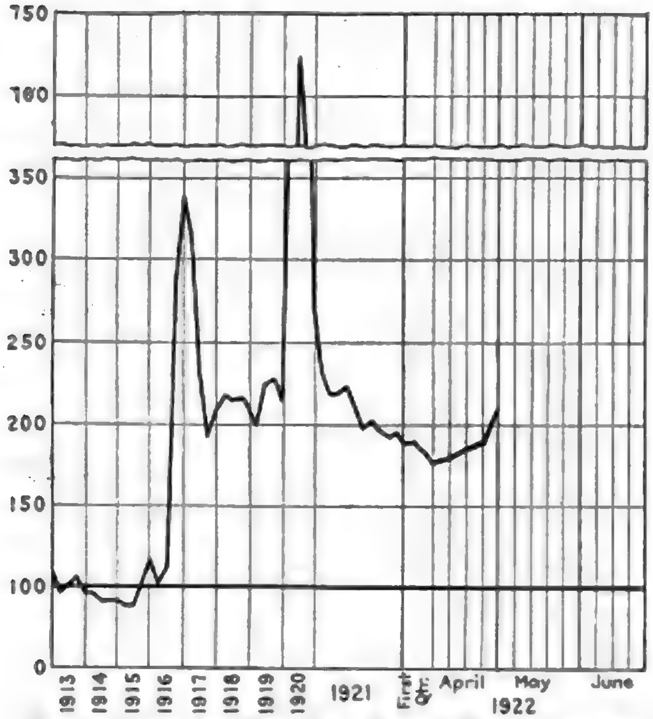
Demand is almost as non-existent, however. The retail

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Mar 27, 1922	Apr. 10, 1922	Apr. 17, 1922	Apr. 24, 1922†
Pocahontas lump	Columbus	$2.75	$2.85	$2.85	$2.65@$3.00
Pocahontas mine run	Columbus	1.75	2.15	1.90	**1.90@2.10**
Pocahontas screenings	Columbus	1.25	1.35	1.40	**1.50@1.60**
Pocahontas lump	Chicago	2.70	2.40	2.50	*2.10@2.50*
Pocahontas mine run	Chicago	1.35	1.75	1.65	**1.75@1.85**
Pocahontas lump	Cincinnati	2.75	2.50	2.35	**2.50@2.75**
Pocahontas mine run	Cincinnati	1.70	1.90	1.70	**2.00**
Pocahontas screenings	Cincinnati	1.15	1.65	1.60	**1.75@2.00**
*Smokeless mine run	Boston	4.55	4.60	4.75	**4.75@4.85**
Clearfield mine run	Boston	1.95	2.05	2.15	**2.50@2.90**
Cambria mine run	Boston	2.45	2.30	2.55	**3.00@3.50**
Somerset mine run	Boston	1.90	2.10	2.25	**2.40@3.00**
Pool 1 (Navy Standard)	New York	2.85	2.80	3.40	**2.90@3.75**
Pool 1 (Navy Standard)	Philadelphia	2.80	2.80	3.15	**3.00@3.85**
Pool 1 (Navy Standard)	Baltimore	2.65	2.70	....	**3.50@4.00**
Pool 9 (Super. Low Vol.)	New York	2.25	2.40	3.25	3.00@3.50
Pool 9 (Super. Low Vol.)	Philadelphia	2.15	2.30	2.75	**2.85@3.25**
Pool 9 (Super. Low Vol.)	Baltimore	2.25	2.50	....	**3.00@3.50**
Pool 10 (H. Gr. Low Vol.)	New York	2.10	1.95	2.75	**2.75@3.25**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	1.90	2.00	....	**2.75@3.00**
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.15	2.25	....	**2.85@3.00**
Pool 11 (Low Vol.)	New York	1.80	1.75	2.75	2.50@3.00
Pool 11 (Low Vol.)	Philadelphia	1.70	1.75	2.25	**2.60@2.75**
Pool 11 (Low Vol.)	Baltimore	2.05	2.15	2.75	**2.75@2.90**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.55	1.70	2.90	*2.25@2.75*
Pool 54-64 (Gas and St.)	Philadelphia	1.40	1.55	2.15	....
Pool 54-64 (Gas and St.)	Baltimore	1.55	1.70	2.90	....
Pittsburgh sc'd. Gas	Pittsburgh	2.65	....	....	....
Pittsburgh mine run (St.)	Pittsburgh	1.85	....	....	....
Pittsburgh slack (Gas)	Pittsburgh	1.55	....	....	....
Kanawha lump	Columbus	2.30	2.35	2.50	**2.40@2.65**
Kanawha mine run	Columbus	1.50	1.55	1.60	**2.00@2.25**
Kanawha screenings	Columbus	1.35	1.45	1.50	**1.50@1.85**
W. Va. Splint lump	Cincinnati	2.15	2.00	2.00	**2.50@2.75**
W. Va. Gas lump	Cincinnati	1.95	1.75	1.75	**2.25@2.50**
W. Va. mine run	Cincinnati	1.35	1.55	1.90	**1.90@2.00**
W. Va. screenings	Cincinnati	1.30	1.40	1.70	**1.75@2.00**
Hocking lump	Columbus	2.55	....	2.65	2.50@2.75
Hocking mine run	Columbus	1.75	....	1.75	**2.00@2.25**

	Market Quoted	Mar 27, 1922	Apr. 10, 1922	Apr. 17, 1922	Apr. 24, 1922†
Hocking screenings	Columbus	$1.45	....	$1.50	**$1.65@$1.85**
Pitts. No. 8 lump	Cleveland	2.80	$2.60	3.40	3.00@3.80
Pitts. No. 8 mine run	Cleveland	1.85	1.80	2.35	**2.50@2.60**
Pitts. No. 8 screenings	Cleveland	1.70	1.85	2.20	**2.50@2.60**
Midwest					
Franklin, Ill. lump	Chicago	3.25	3.45	3.30	3.30@3.65
Franklin, Ill. mine run	Chicago	2.25	2.75	2.75	2.50@3.00
Franklin, Ill. screenings	Chicago	2.00	2.65	2.75	2.50@3.00
Central, Ill. lump	Chicago	2.60	2.60	....	**2.50@2.75**
Central, Ill. mine run	Chicago	2.25	2.60	....	**2.50@2.75**
Central, Ill., screenings	Chicago	1.85	1.85	....	1.75@2.00
Ind. 4th Vein lump	Chicago	3.15	3.15	3.15	3.00@3.25
Ind. 4th Vein mine run	Chicago	2.35	2.45	2.50	2.25@2.75
Ind. 4th Vein screenings	Chicago	2.15	2.00	2.25	2.00@2.50
Ind. 5th Vein lump	Chicago	2.85	2.60	2.60	2.50@2.75
Ind. 5th Vein mine run	Chicago	2.20	2.60	2.60	2.50@2.75
Ind. 5th Vein screenings	Chicago	1.75	2.20	2.40	2.25@2.50
Standard lump	St. Louis	2.45	2.65	....	....
Standard mine run	St. Louis	1.85	1.90	....	....
Standard screenings	St. Louis	1.35	1.70	....	....
West. Ky. lump	Louisville	2.35	2.45	2.35	*2.15@2.[illegible]*
West. Ky. mine run	Louisville	1.75	1.90	2.00	1.90@2.10
West. Ky. screenings	Louisville	1.60	1.90	1.90	**2.15@2.35**
South and Southwest					
Big Seam lump	Birmingham	2.10	2.00	2.00	2.00
Big Seam mine run	Birmingham	1.85	1.70	1.70	1.50@1.90
Big Seam (washed)	Birmingham	1.85	1.85	1.85	1.75@2.00
S. E. Ky. lump	Louisville	2.10	2.25	2.25	**2.25@2.50**
S. E. Ky. mine run	Louisville	1.55	1.70	1.75	**2.25@2.50**
S. E. Ky. screenings	Louisville	1.40	1.50	1.55	**1.60@1.75**
S. E. Ky. lump	Cincinnati	2.10	1.90	2.15	**2.25@2.50**
S. E. Ky. mine run	Cincinnati	1.30	1.60	1.90	**2.00**
S. E. Ky. screenings	Cincinnati	1.25	1.45	1.65	1.50@1.75
Kansas lump	Kansas City	4.50	4.25	4.25	4.00@4.50
Kansas mine run	Kansas City	4.00	4.00	4.00	4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in heavy type, declines in *italics*.



Coal Age Index 206, Week of April 24, 1922. Average spot price for same period, $2.49. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh, Mt. Olive and Standard prices not included in figures for last week.)

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to April 1, 1922 Inclusive	Week Ended April 8
U. S. Total	45.6	55.7	....
Non-union			
Alabama	63.5	64.6	76.5
Somerset County	55.5	74.9	87.3
Panhandle, W. Va.	55.3	51.3	30.8
Westmoreland	54.9	58.6	83.3
Virginia	54.8	59.9	60.9
Harlan	53.3	54.8	29.2
Hazard	51.7	58.4	43.7
Pocahonta	49.8	60.0	64.3
Tug River	48.1	63.7	67.8
Logan	47.6	61.1	66.2
Cumberland-Piedmont	46.6	50.6	7.4
Winding Gulf	45.7	64.3	61.5
Kenova-Thacker	38.2	54.3	63.0
N. E. Kentucky	32.9	47.7	52.9
New River‡	24.3	37.9	7.3
Union			
Oklahoma	63.9	59.6	6.7
Iowa	57.4	78.4	0.0
Ohio, north and central	52.6	46.6	0.0
Missouri	50.7	66.8	0.2
Illinois	44.8	54.5	0.0
Kansas	42.0	54.0	4.0
Indiana	41.4	53.8	0.0
Pittsburgh†	41.2	39.8	0.0
Central Pennsylvania	39.1	50.2	14.1
Fairmont	35.3	44.0	1.1
Western Kentucky	32.5	37.7	20.8
Pittsburgh*	30.4	31.9	0.0
Kanawha	26.0	13.0	0.5
Ohio, southern	22.9	24.3	0.0

* Rail and river mines combined.
† Rail mines
‡ Union in 1921, non-union in 1922.

trade has been very quiet and while yard stocks of the larger sizes are somewhat depleted the householder exhibits no anxiety over the next winter's needs. Pea coal is still plentiful, both at retail and shipping points, and rumor has it that some price cuts may be made to move old stocks of pea accumulated near a large market center before the last freight rate advance became effective.

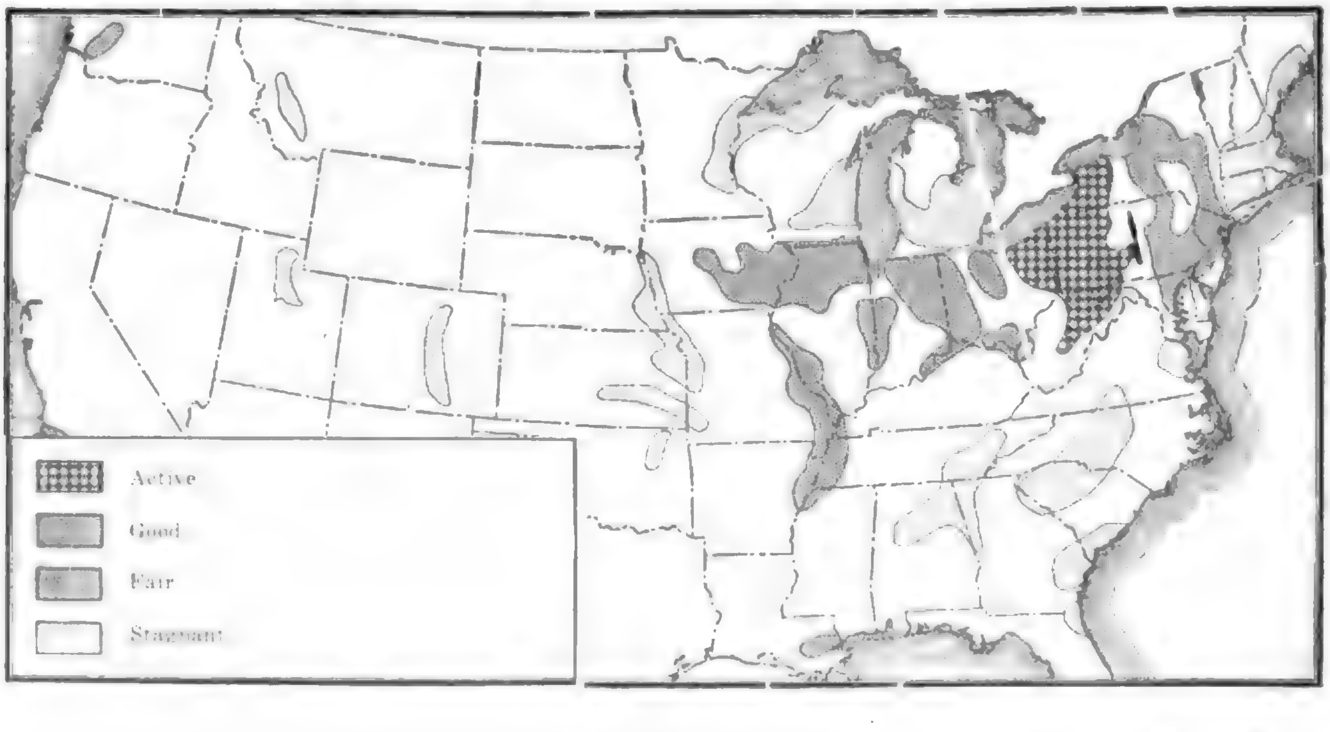
Steam sizes are becoming scarce, with the exception of buckwheat. Barley is the shortest of the steam grades, but prices show no effect of the shortage. The Lake situation is quiet, with Northwest buyers apparently out of the market until the mining controversy is settled.

COKE

Production of beehive coke was 149,000 net tons during the second week of the strike, 26,000 tons less than in the preceding week. The chief factor in the decline was the extension of the strike in the Connellsville and Lower Connellsville regions.

Late reports indicate that the tide of the strike in this section is now stationary. The general belief is that the non-union strike will wear itself out and that the flow of returning workers will slowly increase this week. There is very little coke on the market and prices are variable.

Relative Activity of Markets for Bituminous Coal at End of Third Week of Strike



Foreign Market And Export News

British Output Gains; Little Business Results from U. S. Strike.

BRITISH production for the week ended April 8 showed a gain over the preceding week's figure according to a cable to *Coal Age*. The output was 4,961,000 gross tons, as compared with 4,825,000 gross tons for the week before.

Newcastle reports increased activity due to inquiries from the Scandinavian Railways. So far very little actual business has resulted from the strike in the United States. Scotland is getting ready to supply the South American markets, as inquiries are anticipated from Argentina and the Plate. Some small shipments have already been made to Canada, and further orders are anticipated. Collieries are building up reserves and are behind on deliveries.

The railway companies have not yet made up their minds on the question of reduced rail rates for coal. The question of submittting a common-user scheme for the existing system of the private ownership of wagons has again been raised, and the suggestion has been advanced that representatives of all the interests concerned, railways, collieries, users, wagon-builders and finance companies, should meet in conference to discuss the matter exhaustively.

The colliery companies, as parties whose interests are vitally concerned, see no inducement to agree to the proposed change. Their experience of the transport reorganization scheme introduced by the Coal Control Department in 1917 is such as to dampen any enthusiasm for an elaborate rearrangement of wagon running on the lines indicated. The railway companies, naturally enough, desire a maximum of tonnage, and as few wagons as possible running empty on their lines: the collieries' chief concern is to secure that their trucks shall be returned with the utmost possible despatch to obviate the accumulation of coal stocks at the pit-head, and the resultant evils of holding up work in the pits.

The chief obstacle to the common-user proposal is, however, the practical impossibility of co-ordinating and regulating wagon supplies on the enormously extended scale that such a system would entail. The attempt at traffic reorganization made by the Coal Control Department during the war gave an instructive illustration of this. Thus, at some collieries there was a glut of wagons and at others something in the nature of a wagon famine.

High-Volatile Demand Features Hampton Roads Market

The week was featured by the increasing demand for high-volatile coals, the price at the mines having been raised to $2, bringing the price at the piers to $5, with supplies gradually diminishing. Prices of other grades, also, were on the upward trend.

Movement of coal to New York in increasingly large volume was another feature of the situation, every available barge and schooner during the week finding a ready charter. The supply of bottoms devoted to this sort of trade is exceedingly scarce.

New England movements were not as great as usual, but the export business was moving at an increased rate. Dumpings were slightly increased at all piers, although the market was regarded as being not particularly active except for high-volatile grades.

Indications are that high-volatile coals, in demand for use by gas making plants and similar industries, will go still higher.

TOTAL EXPORTS DURING MARCH were 294,753 gross tons of anthracite, 1,187,313 tons of soft coal and 25,435 tons of coke, as compared with March, 1921, figures of 307,940 tons of hard coal, 1,151,840 bituminous and 25,061 of coke.

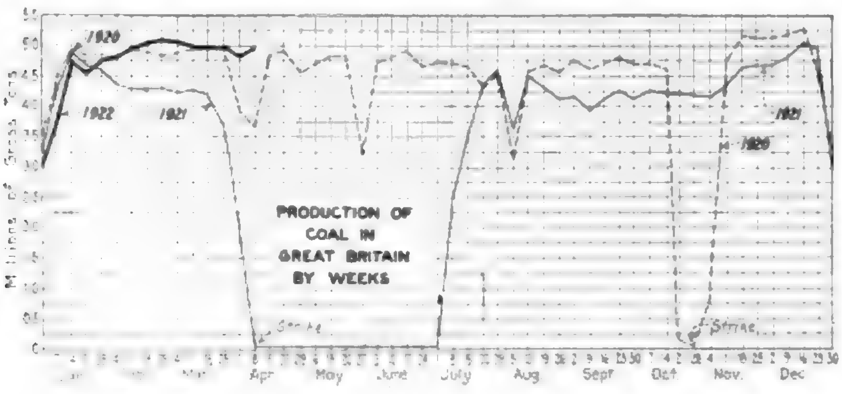
Coal Paragraphs from Foreign Lands

GERMANY — Production in the Ruhr region for the week ended April 8 was 1,908,000 metric tons, according to a cable to *Coal Age*, as compared with 1,930,000 tons in the previous week.

ITALY — The price of Cardiff steam first is quoted at 42s. 9d., according to a cable to *Coal Age*. Last week's quotation was 40s. 9d.

NEW SOUTH WALES—Total exports of coal from Newcastle (N.S.W.) to places beyond during the month of March were 300,000 tons.

INDIA — The coal market continues firm. Foreign coal is being purchased by mills and railways. The prices are: Bengal 1st., Rs. 36, Bengal good 2nd, Rs. 32; British coal. Rs. 39.



Export Clearances, Week Ended April 20, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Nor. S.S. Manchioneal, for Kingston	1,414
Du. S.S. Britsum, for Port au Spain	2,979
For Canada:	
Br. S.S. Bilbster, for Montreal	7,263
For Chile:	
Am. S.S. Republic, for San Antonio	751
For Cuba:	
Nor. S.S. Geflon, for Havana	3,717
Am. S.S. Bayamo, for Havana	3,985
For England:	
Br. Schr. Martha Parsons, for Yarmouth	804
For Ecuador:	
Br. S.S. Almagro, for Guayaquil	1,025
For Italy:	
Ital. S.S. Adige, for Genoa	9,443
Ital. S.S. Sile, for Naples	8,734
Am. S.S. Tonawanda, for Astoria	2,506
Nor. S.S. Brighton, for Cayo Mambe	594
Dan S.S. Phonix, for St. Thomas	3,245

Hampton Roads Pier Situation

	—Week Ended—	
	April 13	April 20
N. & W. Piers, Lamberts Point:		
Cars on hand	2,156	2,739
Tons on hand	113,665	150,020
Tons dumped	171,267	177,558
Tonnage waiting	24,000	25,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,370	1,330
Tons on hand	77,850	79,250
Tons dumped	86,867	88,135
Tonnage waiting	14,000	42,000
C. & O. Piers, Newport News:		
Cars on hand	1,217	1,041
Tons on hand	60,850	52,050
Tons dumped	47,927	62,779
Tonnage waiting	2,200	19,000

Pier and Bunker Prices, Gross Tons

PIERS	April 15	April 22†
Pool 9, New York	$6 25@$6 50	*$6 15@$6 40*
Pool 10, New York	5 80@ 6 10	5 80@ 6 10
Pool 9, Philadelphia	5 60@ 6 00	**6 10@ 6 50**
Pool 10, Philadelphia	5 50@ 5 80	**5 75@ 6 10**
Pool 71, Philadelphia	6 00@ 6 25	**6 50@ 6 65**
Pool 1, Hamp. Rds.	4 70@ 4 80	**4 75@ 4 85**
Pools 5-6-7 Hamp. Rds	4 65@ 4 80	**5 00**
Pool 2, Hamp. Rds.	4 50@ 4 60	**4 75**
BUNKERS		
Pool 9, New York	$6 40@$6 65	**$6 45@$6 70**
Pool 10, New York	5 90@ 6 30	**6 10@ 6 40**
Pool 9, Philadelphia	5 85@ 6 30	**6 40@ 6 55**
Pool 10, Philadelphia	5 80@ 6 20	**5 85@ 6 25**
Pool 1, Hamp. Rds.	4 90	4 85@ 4 90
Pool 2, Hamp. Rds.	4 75	4 75
Welsh, Gibraltar	40s 6d. f.o.b.	40s 6d f.o.b.
Welsh, Rio de Janeiro	55s f.o.b.	55s f.o.b.
Welsh, Lisbon	40s f.o.b.	**42s** f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	42s f.o.b.	42s f.o.b.
Welsh, Messina	38s. f.o.b.	38s f.o.b.
Welsh, Algiers	38s 6d f.o.b.	38s 6d f.o.b.
Welsh, Pernambuco	62s 6d f.o.b.	62s. 6d f.o.b.
Welsh, Bahia	62s 6d f.o.b.	62s 6d f.o.b.
Welsh, Madeira	38s. f.a.s.	**40s** f.a.s.
Welsh, Teneriffe	38s. f.a.s.	38s f.a.s.
Welsh, Malta	42s. f.o.b.	42s f.o.b.
Welsh, Las Palmas	40s. f.a.s.	40s f.a.s.
Welsh, Naples	38s f.o.b.	38s. f.o.b.
Welsh, Rosario	52s 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s f.o.b.	55s. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d f.o.b.
Alexandria	45s.	45s
Bombay	38 rupees	38 rupees
Capetown	39s.	39s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	April 15	
Admiralty, Large	28s to 28s 6d	**28s 6d to 29s**
Steam, Smalls	19s. 6d to 20s.	*19s to 20s.*
Newcastle:		
Best Steams	24s	23s 9d to 24s 3d
Best Gas	24s to 24s 6d.	24s. to 24s 6d
Best Bunkers	23s. 9d.	*22s. 6d to 23s.*

†Advances over previous week shown in **heavy type**; declines in *italics*

North Atlantic

Bituminous Prices Strong; Spot Call Gains But Little

Heavy Purchases Made to Replace Coal Due from Closed Non-Union Mines—Receipts from South Heavier—Pennsylvania Fuels Coming Again—Stem in Rising Prices Seen.

EASTER holiday idleness and non-union troubles are responsible for a strong price situation in the bituminous markets. Shippers are executing heavy buying orders to replace tonnage due on contracts from closed non-union operations. The actual spot demand, however, has not increased much, and industries are digging into their reserves rather than buy high-priced coal on the open market.

Southern coals are coming to New York and Philadelphia in increasing volume. Receipts of Pennsylvania fuels are again on the upturn, and this improvement together with the heavy shipping from Hampton Roads is expected to stem the rising tide of prices. Some producers are now making agreements at reduced figures, to run for thirty days, to insure steady operations.

BALTIMORE

The market shows a sharp increase in demand from consumers who find that they are now eating steadily into stocks and who are unable to get reliable runs from contracts, or no deliveries at all. This is stimulating the price situation and opening it to wide fluctuations as set by individual needs.

On the other hand, there is still a large class, mostly of the more important consumers, who are sitting pat on their present supplies and who do not seem interested in the market one way or the other. This has led to a situation in which the demand as a whole is not great, but what is in evidence is insistent and willing to meet a sharply advancing price condition.

Prices are over a wide range. At this writing almost any kind of West Virginia coal from non-union sources is calling for $3.25@$3.75 per net ton, while the greatly reduced supply from Pennsylvania is calling for around $4. The export situation has come to an abrupt close here since the price jump.

NEW YORK

Loss of production because of the Easter holidays and the joining of many non-union workers with the striking miners are two factors responsible for the increase in quotations. Demand has not increased apparently but there is not as much free coal around because of the heavy buying by shippers with heavy contracts which must be filled and the entrance of the steel industry into the buyers market.

On April 21 there were slightly over 2,000 cars at the local piers, which was an increase of about 1,000 over the corresponding day of the previous week. There were also about 45,000 tons of Southern coals in the harbor, of which about 25,000 tons was obligated, the balance being free coal. The latter was being quoted over the wide range of $6.15@$7, alongside.

It was pointed out that with the West taking more of these Southern coals it will result in a strong demand here for Pennsylvania coals. So far large industrial buyers have refused to become excited or to enter the market in large numbers.

Buyers are not anxious to increase their reserve stocks. Should industrial supplies diminish sufficiently because of the closing down of the non-union mines in Pennsylvania to cause a shortage, it is believed that with Southern coals coming in the shortage here will be eliminated.

PHILADELPHIA

Selling houses have almost ceased to urge consumers to buy, yet when the customer is ready for coal he is surprised to find that the fuels of the three highest grades are closely grouped as to price, and considerably higher than a month ago. It is an extremely odd situation, and at first thought it would seem that the law of supply and demand had for the moment been abrogated.

The real guess on the situation, however, is that as soon as the consumers come into the market in considerably increased numbers the prices will rise rapidly, as even at the present higher prices many producers claim that they are still running at a loss, especially since they lose so much time and are unable to make a full working week.

The general feeling seems to be that considerable gains have been made in getting non-union men back to work. Right in line with this there have been instances of some producers entering into agreements of daily shipments during the course of the ensuing thirty days.

There has been some stiffening of prices at piers on both bunker and Tide coal, but there has been very little new export business closed in the past ten days.

CENTRAL PENNSYLVANIA

Prices have risen over those which prevailed on March 31. At the close of the third week of the strike quotations were: Pool 9, $2.90@$3; Pool 10 $2.75 @$2.80; Pool 11, $2.50@ $2.60.

The first trouble in the district arose in Clearfield County when a series of explosions wrecked the mines of John Laing at Winterburn, on April 19. At Bitumen, Clinton County, forty families were evicted from company houses belonging to the Kettle Creek Coal Co. when the court dismissed an injunction against the company. In Somerset County, an injunction was secured to restrain the miners from holding meetings on company property and enjoining the miners from becoming disorderly.

The pinch of the strike is beginning to be felt in Cambria, Somerset and Blair counties. Coal supplies are dwindling, the railroads are sequestering coal in transit and the heavier shipments are going to the big markets in the East.

FAIRMONT

Gains in the number of mines at work were recorded during the second week of the strike, although such gains were not large. The most important development was the sharp increase in demand for mine run and the corresponding increase in price to $2.50.

UPPER POTOMAC

Upper Potomac operators made slight gains during the week ended April 15, with the United Mine Workers unable to make any progress in weaning miners away from their work. Producers were preparing to resume under the stimulus of a better demand and an increase in prices, amounting to as much as 35c. a ton. In the Georges Creek territory virtually all the mines are down.

South

BIRMINGHAM

There have been no developments the past week to improve market conditions here. Buying is on a more restricted scale than for several weeks. Inquiry is weak, prices are unchanged and the volume of sales is small.

The Louisville & Nashville and Frisco railroads have under consideration bids for next year's fuel supply, and contracts will probably be awarded shortly. The Seaboard Air Line likewise has taken bids and awards are expected within the next week or ten days. Industrial contracting is not much in evidence.

Sales of domestic grades are slow, and although some contracts are being made, there is a hesitancy on the part of dealers to enter into agreements so far. This is due to some extent by belief that there will be some reduction in freight rates, which may be taken advantage of on deferred deliveries.

There has been a heavy increase in the amount of coal being consumed in coke making, as the need for furnace coke is greater than before in a year or more. Several additional stacks have been blown in the past week and one or two more are being gotten in readiness for early lighting. One company has put in fifty byproduct ovens which have been out of blast for nearly two years. Production at the mines of furnace companies is making up for the shortage at commercial operations, the output as a whole being about normal.

VIRGINIA

During the second week of April industrial consumers entered more actively into the market and began buying on a heavier scale, even to the extent of bidding against each other for supplies. Production grew stronger as the week advanced. Prices stiffened appreciably, mine run being quoted $1.75@ $2.

Anthracite

Demand Lacking; Consumers Hold Off for Lower Prices

Retail Stocks Slowly Vanish, with No Replacement Tonnage but Pea in Sight—Steam Sizes Except Buckwheat Scarce—Northwest Stocks Keep Lake Situation Quiet.

LACK of demand predominates. Retail trading is sluggish, as the householder prefers to delay orders for next season in the hope of lower delivered costs. Retail stocks of the larger coals, however, are being slowly depleted and there is no replacement tonnage available, with the exception of pea. There is a rumor that some companies may reduce pea prices in order to move old storage piles accumulated near a large center before the last freight-rate increase.

Steam business is almost entirely confined to buckwheat No. 1, as the other sizes are scarce. The Lake situation is quiet, as Northwestern stocks are good and those buyers are making no overtures until the wage situation shall have been settled.

PHILADELPHIA

All that transpires in the trade is confined to the retail end, and even here there has been an almost total cessation of activity. Most retailers have good stocks of every size, although chestnut is slowly becoming depleted. Dealers had calculated that May 1 would see their yards bare, but this does not seem likely at the present rate of movement.

The trade shows not the least tendency to add to their stocks of pea, as there is a feeling that even if the strike lasts several months they will have sufficient to meet the demand.

There was recently a rumor that some of the companies have decided to reduce pea coal 50c. Some in the trade seemed to base this idea upon the fact that much of the pea in storage had been placed there under the old freight rate, and that the companies with storage yards located near the city might share this saving with the dealer.

In the steam trade all activity is confined to buckwheat, with no real buying in evidence. There is only a small quantity of rice and barley for shipment, and on this small tonnage one of the companies is confining orders to points strictly within the state.

NEW YORK

Lack of demand is the feature of the market. The consumer does not appear concerned about the strike and this attitude is reflected in the wholesale end of the industry.

Retail stocks are being depleted slowly and with the coal going out and almost nothing coming in there is bound to come a time when those who have coal to sell will have a call for it.

With a few exceptions the companies have nothing to offer above pea coal. Some wholesale dealers and middle houses have small lots of egg, stove and chestnut on hand but find few buyers and these are not willing to pay more than company circular. Little headway is being made in reducing the stock piles of pea.

The steam coal situation is easy. Barley is the shortest and buckwheat is plentiful. There are many loaded boats here. Demand for barley is not so strong as a few weeks ago.

BALTIMORE

Shipments into this territory have run out. The only class now offering is from certain operations with uncontracted supplies of buckwheat, rice and barley. There is no call, however, for this class of coal here at this time.

BOSTON

There is very little tonnage now in the hands of most producers, but in spite of this there is only moderate inquiry for spot coal even of the more desirable domestic sizes. Retail trade is temporarily better because of cool weather, but there is no snap to demand and the dealers are not inclined to add to present stocks which they regard as adequate.

Practically no independent coal is offering. A few of the companies have small lots of odd kinds and sizes that are being absorbed from day to day, but such coals are not being marketed without a certain amount of effort. So far there has been no change in prices due to the suspension.

ANTHRACITE FIELDS

A few disturbances occurred last week. The union has succeeded in tying up all non-union washeries but one. Some trouble at the East Boston Coal Co., due to the union interfering with work in connection with keeping the boiler plant running, resulted in the posting of a guard at the colliery.

There is some apprehension that the foreign element cannot be kept under control if the suspension lasts much longer. Staff vacations are being urged by many of the coal companies, who want to have the vacation season ended by June 1.

BUFFALO

Conditions are much the same as in bituminous. Demand is at its lowest. Consumers never buy much now unless stimulated by price reduction, but no price change is likely till wages are fixed.

No effort is being made to ship anthracite by Lake. Two cargoes, coal that was owned by the consignee, have gone forward, but that will be all for awhile. Shippers are merely waiting for work to be resumed.

Independents have a little coal and they are trying to get a premium for it, but jobbers have so little market that they do not dare to buy.

Coke

CONNELLSVILLE

The non-union strikes in the Lower Connellsville region have spread in the past week, until coke production is less than one-third the rate at the end of March. In the Connellsville region or old basin, there has been some additional striking, but production is probably much more than half as great as at the end of March, partly because some idle plants in the region were started when it was seen there would be trouble in the Lower Connellsville.

The iron and steel industry as a whole is but little affected, on account of its large dependence upon other coal and coke districts. However, a few furnaces normally tributary to the Connellsville region are banked, while others that it was desired to blow in have remained idle.

Connellsville furnace coke is unquotable. Only odd lots are offered, at prices the blast furnaces would not think of paying. A limited demand for foundry coke has developed, the great majority of foundries having stocked freely, and small sales have just been made at $6.25, which compares with the heavy turnover in March at $4.25@$4.75.

The *Courier* reports coke production in the past three weeks as follows:

Week Ended.	Connellsville.	Lower Connellsville.	Total.
April 1 ..	87,950	62,010	149,960
April 8 ..	102,530	31,890	134,420
April 15 ..	87,810	11,000	98,810

UNIONTOWN

The stiff coal market softened, when the U. S. Steel Corporation withdrew buying orders at various offices in Uniontown and Connellsville. The trade reports that since the Frick mines became seriously affected the corporation has been practically the only large buyer of coal in the open market. The result was that one buyer was running the market steadily upward.

The result of the cancellation was that coal dropped off and tonnage on track being held at $3 could be bought at $2.50. Those who were holding out are not meeting with much success finding a buyer. Byproduct is yet quoted at $3 but steam coal, either Pittsburgh or Sewickley, is $2.40@$2.50. The coke market is virtually inactive, there being no tonnage and no demand.

The advance of the union apparently has struck a stone wall at the Leisenrings which it has not been able to hammer through. The return to work also is developing at a number of Frick mines, the workers showing up in increasing numbers.

BUFFALO

Demand is next to nothing locally, but the supply is still smaller, so that prices have advanced considerably. Quotations are $5.25@$5.50 for best 72-hr. Connellsville foundry, $4@$4.25 for 48-hr. furnace, $3.50 for stock, with domestic sizes practically without a buyer.

Chicago and Midwest

Coal Market Registers A Variety of Emotions

Some Buyers Nervous, Others Are Calm —Docks Begin Ordering; Trade Wonders Why—Slight Pick-up Seen in Certain Industries—Prices Stiffer.

NERVOUSNESS in some quarters and phlegmatic disinterest in others characterized the Midwest market during the past week. A slight pick-up in a few industries, backed by the noticeable improvement of the steel trades has put bottom into the market for certain Eastern coals moving north and west and has stiffened prices on steam sizes. The fact that many dock companies began buying in considerable quantities has awakened a good deal of interest. While some fields are shipping in this direction there is not enough demand to revive western Kentucky operations. No strike disturbances of any consequence have occurred in the Midwest fields.

The coal trade attributed the dock demand variously. One view was that the dock men must have received some quiet business from railroads. Another was that dock concerns cannot bear to lose a day of the shipping season even though they may not have a single new buyer. The general belief is that coal will never be cheaper than it is right now and that dock companies are wise if they are stocking.

While it is true very little coal of any kind is selling in this market for Western consumption, inquiries are getting more numerous. The inference is that reserves are melting and that some public utilities are beginning to fret a trifle and even railroads are feeling a trace of uneasiness in spite of the heavy stocks. Few railroads are stocked to stand a coal cut-off for more than 90 days longer and most of them are good for only about 50 or 60. Well informed coal men think the strike will run deep into the summer.

During the last few days of mine operation before April 1 certain of the railroads, taking a look at the discouraging strings of idle box and cattle cars along their lines, rushed them to the mines and had them loaded. Thus, coal now stands not only in open top coal equipment but in almost every kind of cars made.

Chicago feels that a slight trade improvement is starting. Some companies that did not figure on reopening, and therefore stocked little coal, are laying plans for action. Every time one asks about the price of 100 cars of coal, the trade thinks there is a call for 1,000 cars and excitement prevails, with the inevitable tendency toward a hike in prices. Most of these inquiries are for steam sizes and Eastern steam is beginning to thin out in this region.

CHICAGO

Apprehension on one score or another continues to roll up. But dock companies are buying again. Everybody with eastern Kentucky or West Virginia connections is answering. Already considerable tonnages have been booked for quick delivery. Most of this is spot business on smokeless mine run at $1.75 though some screenings have also been shipped. At least one concern is reported to have agreed to deliver a few thousand tons of lump next month at $2.25. But most selling agencies are refusing to quote anything but spot quotations.

What will the morrow bring, is the question always on their minds. Thus far it has brought little except new daily crops of apprehension. Most coal men with fuel to sell and who could not find a steel or iron company in the awakened Youngstown region with which to do business continue to fret and figure out ways to cut the expenses of their organizations.

During the latter part of last week there was also noticeable in Chicago a trace of demand from the cement, brick and tile industries and the paper mills of the upper lake states. A few of the thousands of cars of domestic coal standing on track at the southern Illinois mines were moved from day to day at pre-strike prices. That was all the average Midwestern coal company did. Brisk weather gave the retail trade in the city a faint stir but few indeed were the retailers who bought anything from jobbers.

WESTERN KENTUCKY

The market is a little stiffer. Producers are standing out for an average of $2.15 a ton on a mine-run basis. Stocks of lump are still hard to sell, but tonnage that has been on track since April 1 is moving better.

Not many mines are running, and even these are on part time. From April 1 to 13, a total of only fifteen reporting mines out of thirty-seven on the Illinois Central R.R., worked. The showing on the Louisville & Nashville lines was a little better.

Most of the tonnage that is being shipped is going to Chicago and St. Louis, with a few inqujries from Cincinnati, Indianapolis and points north of the river.

Screenings are scarce. Some operators are making their screenings sell their lump. Production of anything other than mine run is very likely to be quite light for the next few weeks. Inquiry from industries is growing.

LOUISVILLE

While there is practically no demand for lump coal the demand for mine run is picking up rapidly in the eastern Kentucky field. Lake movement is starting, and this with orders from the steel companies improves shipping.

Prices have stiffened up, mine run jumping 50 to 75c. a ton in the eastern Kentucky field. It is higher than spot lump coal, as there is considerable unsold lump on cars. Mine run is in demand and there is of course a fair demand for screenings.

Last week mine run was quoted $1.35@$1.75 a ton, whereas this week the price is $2.25@$2.50, with all eastern Kentucky fields on the same basis, differentials having been removed for the time being. Lump on the other hand is quoted at $2@$2.25 and screenings, $1.60@$1.75. Last week screenings ranged $1.35@$1.60, and lump $2@$2.40, showing that there have been actually some increases in prices over the week.

While there is little moving South, there is movement to Youngstown, Cleveland, Chicago, and Lake ports. So far there has been practically no Eastern business, as freight rates are high.

The strike is having very little effect. Many union workers refused to quit. Workers have been fired upon in one case, and a tipple burned in another.

ST. LOUIS

The coal trade is quieter than ever before. One large dealer with fourteen yards received in one day an order for two tons of anthracite and no bituminous.

The public is trying to manage to get along on what coal it has, anticipating an unusually heavy decline in prices when the strike is over. Country domestic business is also dead.

Steam locally is easy. Big buyers have a plentiful supply on hand and here and there is a little call. Country steam business is quiet. A little stuff is moving to jobbers in Chicago.

SOUTHERN ILLINOIS

There is still some lump coal at southern Illinois mines held to apply against contracts, there being very little free coal for sale on the open market anywhere in these fields and such as there is is entirely lump. It is almost impossible to get a price on free lump that is uniform. Some of it ranges from $3.65 upward. There is, however, very little demand. The railroads still have an abundance of coal along the right of way. No trouble at any mines is reported.

Much the same condition prevails in the Mt. Olive field. In the Standard field there is a gradual thinning out of coal. Several mines still have a good tonnage held in reserve. It is almost impossible to move any on the open market. Prices range around $3@$3.50 for domestic sizes.

INDIANAPOLIS

Cold weather for another week, the kind of cold that makes a fire imperative, will mean much to the domestic coal demand in Indiana, according to reports received from retail dealers throughout the state. Thousands of coal piles are down to the last few pounds and just a little more cold weather will cause a real demand. Retail dealers say there is sufficient on hand to take care of any demand, but cold weather will affect prices.

Some coal is being received in Indiana from non-union mines, but the volume is very small. Up to the present time the sales of steam coal held in reserve have been slight, most of the industries using their own reserves. Unless there is a decided increase in business the industrial demand will continue small.

Northwest

Trade Still Sluggish In Upper Lake Region

Some Dock Men Worry for Fear Strike Wind-up Will Catch Them Stocked with High-Cost Fuel—Prices Cut to Stimulate Business.

THERE has been no awakening of business throughout the Northwest. Shipments off the docks have been so light that price concessions have appeared. Dock men find there is no other way to create any trade. Some are even talking of the chance they are running of getting caught with a lot of fairly high-priced fuel on their hands in case of an early strike settlement. However, shipments to the docks have begun in earnest. The volume that has reached Lake Michigan ports is about half that of the same period last year. Upper docks are just sighting their first cargoes.

John I. Thomas, general agent for the Northern Pacific, at Duluth, is authority for the statement that railroads generally throughout the Northwest are well stocked, and will not require any additional stock for some time to come. Mr. Thomas says the same condition prevails among the public utilities in this region.

DULUTH

Shipments from the docks at the Head-of-the-Lakes to consumers throughout the Northwest have dropped off. Some docks have shaded the lump price of bituminous 50c. from $7, in order to bring in trade.

Accurate figures of the coal on docks here at the first of April have just been released. These show an enormous increase over the coal on hand at the same time last year, and it is considered, reflect accurately the margin of safety which the Northwest enjoys from any possibility of a shortage.

DOCK STOCKS ON HAND APRIL 1

	1922	1921
Bituminous . . .	3,575,180 tons	1,568,667 tons
Anthracite . . .	428,553 tons	84,520 tons

Navigation is officially open. Two cargoes of coal from lower ports have passed the "Soo." Fully 35 cargoes will be received at the Duluth-Superior docks early this season, as these cargoes are already loaded and it is thought improbable that they will be diverted to any other port. This will swell the coal stocks here by 300,000 tons.

Plans to start several industrial plants in the southern part of the state, reported several weeks ago, have been abandoned because of the uncertainty of the coal situation. It is stated that the owners fear a shortage, but some think the greatest fear, is that they will be caught with high-priced coal on contract, in the event of a drop in prices.

The anthracite market is absolutely dead. Warm weather has caused consumers to use bituminous and wood as a substitute for anthracite in house heating. A heavy fall of snow at the Head-of-the-Lakes last week had no effect upon the anthracite market.

MINNEAPOLIS

After three weeks of strike this district is practically unaffected. Sale of coal is even slower than it was in March. Coal men figure there is ample stock for a number of weeks to come. But the present dock stocks could not last more than 25 to 35 per cent of a season. And if there is not a resumption of mining in time to restock the docks before the fall rush, it will leave the Northwest unsupplied at a time when all other districts are drawing upon the mines for about their full production.

No one seems to worry about needing coal in the near future. Large consumers have enough. They are still ready to buy coal to assure against running down their stores while the suspension is on, but only when an enticing figure is made. And price concessions are being made, according to current reports, in order to get business. It is currently reported that business is going where it is drawn by means of liberal concessions from the regular price. Even such inducements are not resulting in notable tonnage. There is not a heavy volume of sales, and it does not seem likely that there will be.

MILWAUKEE

The coal market at Milwaukee is dull. Dealers report a very light demand, which fluctuates with the weather. April has always been a fairly busy month in the coal trade here, due to the fact that anthracite was its cheapest at the beginning of the season, but people have grown tired of high-priced coal and will not buy more than they actually need. They await lower prices.

Coal and coke prices remain unchanged. There is absolutely no uneasiness felt here or in the back country as to the future supply.

Soft coal has begun to come by Lake, but as yet no anthracite has been received. Up to the present two cargoes of soft coal, aggregating about 20,000 tons, have reached port. However, there are six or eight cargoes slated for arrival during the next week or ten days. The appearance of these large coal carriers is what tends to allay any uneasiness that might develop because of the strike. Last year at this period there had been four cargoes docked, amounting to about 50,000 tons.

New England

Advance Buying Has Caused Saturation of the Market

Overuse of Strike Talk Reacts on Sales—Heavy Reserves a Bulwark Against High Prices—Hampton Roads Prices Stronger—Marine Freights Lower.

HAMPTON ROADS prices are stronger, but in New England distress cargoes still go at low figures. So much coal has been pressed on buyers in advance of actual needs that the market is saturated. Too much use of the strike situation on a sales argument is now reacting strongly on sales. Reserves are heavy and will be used as a bulwark against higher prices.

Pennsylvania prices are up, but only because of curtailed production and strong demand from other sections. Marine freights are lower with a further softening tendency as vessels remain plentiful.

Cargo prices are fairly firm, the average quotation being $4.75 f.o.b. vessel. A few cargoes have sold up to $4.85, but so far this higher figure has been exceptional. In this market there is very little inquiry for straight cargoes. Inland consumers being pressed to accept small lots at even lower cost than cargo-lot sales are being made.

Several factors have made it a practice now for some months to force coal on buyers well in advance of actual needs, using the mining suspension as an argument to move coal. As a result New River and Pocahontas have been absorbed to the point of saturation and at this writing 30,000 tons is in the harbor. On this "distress" coal prices have softened to $6 and less.

But a small tonnage of Pennsylvania grades has been offered in the past week, but such quotations as are received are notably higher because of the current situation in the region.

Strange to say, the recent proposals opened by the Department of Mental Diseases, Commonwealth of Massachusetts, 5,150 tons for delivery within 30 days, showed an average of 10c. less than similar proposals 60 days ago. Prices submitted this time were $6.20@$6.25 on cars Boston, Pocahontas and New River being offered in most cases on the rather exacting specifications imposed by the department making the purchase.

In the face of disturbing rumors as to the smokeless districts, it is clear that competition for tonnage Inland from Mystic Wharf, Boston, is even more sharp than hitherto. This causes a certain anxiety among the smaller factors, for there is at least a prospect that some of the larger agencies will feel obliged to put the knife in deep in order to assure themselves a market for their coal.

Eastern Inland

Flurry Subsides; Canceling Of Orders Jars Coal Trade

Tonnage Scarce — Demand Wanes at High Prices—Orders Now Closing at Lower Figures—Half Million Tons of Lake Coal in Vessels at Lower Ports.

THE recent flurry has subsided and while the market is still stronger than at the outset of the strike, the cancellation of many coal orders by the steel trade has had a softening effect. Tonnage is scarce, but so are orders, and demand has sloughed off at the higher prices quoted. Current orders closed are now at lower figures.

Retail markets are dormant and dealers are devoting their attention to cleaning up their stocks before ordering any additional tonnage. There are about 500,000 tons of Lake coal now in vessels at the lower ports and 3,000 cars awaiting dumping.

CLEVELAND

Quietude prevails for the moment but there are many indications that within the next week or so the demand will become much more urgent than at present. Stocks gradually are being cleaned up. In many cases this is happening more quickly than manufacturers had expected, due to the increasing activity in business.

The coal strike itself has had some influence in quickening the pulse of industry. This may be an unhealthy stimulation, but so far the effects have all been favorable. The most important result has been the pronounced influence upon iron and steel. Prices for many iron and steel products are rising and mills are being pressed for deliveries. Practically all of the demand for coal coming through this district is from the steel mills and the railroads. Unless the strike goes so far as to kill off the budding business revival, the industrial outlook is extremely bright.

In the meantime about the only coal being sold here now is some non-union fuel coming from Kentucky and West Virginia. Mine run from these regions is being sold about $1 higher than the pre-strike price for No. 8 coal. Inquiries are increasing daily.

The Lake season is making satisfactory progress, in view of the strike. About 500,000 tons have been loaded and a number of vessels have left ports.

PITTSBURGH

The strike continues without incident and no developments in that quarter are expected for quite a while. In the past week there have been additional non-union strikes in the Lower Connellsville, Connellsville and Upper Connellsville, or Greensburg districts as well as around Irwin and in Westmoreland County. On the other hand at some crippled mines in the Connellsville and Lower Connellsville a few men have returned to work while the working forces are better aligned for production. Production of coal in the general Connellsville region is now at about one-third the rate obtained in March.

There is no regular Pittsburgh district coal on the market. Small offerings of Connellsville coal have been at $2.80 for steam and $3 for byproduct.

There are some reports of fancy prices, and some of these are probably due to misinterpretation of asking prices, a consumer being quoted, refusing to buy, and then mentioning the asked price afterwards as representing "the market." One lot of some 40 carloads, for illustration, was offered to a consumer at $3.25, the consumer refusing to buy. Afterwards the coal was sold elsewhere at $2.50.

The non-union miners are not accustomed to striking, and particularly have had no experience in the long strikes in which the union miners have had so much practice in the past 25 years. The policy of the operators in the Connellsville region, formulated largely by the Frick company, is to let the strikes wear themselves out rather than to take radical action by importing men.

BUFFALO

The situation remains unchanged. Holders of coal are trying to get a higher price for it, but the consumers are not anxious and so far refuse to pay much of an advance. Whether they do or not depends mostly on the action of the non-union miners.

Reports differ as to the strength of the two sides. The daily press is looking for sensations rather than authentic news and the operators are noting favorable indications and forgetting the other side, so the public is in doubt. If coal runs too short the miners will win, but there is no indication of it now.

The consumer is asking for scarcely any coal beyond his ordinary supply and that has been taken care of as far as possible. New orders are few and the coal to meet them is hard to get.

Buffalo so far refuses to pay the dollar or so advance asked at the mines, so quotations must remain on the basis of $2.65 for Youghiogheny gas lump, $2.50 for Pittsburgh and No. 8 steam lump, $2.25 for Allegheny Valley and other mine run and $1.50@$1.75 for slack.

EASTERN OHIO

Except for a very small tonnage being produced by stripping operations a complete shut-down continues. However, the rank and file of industry, public utilities and the railroads have an ample supply of reserve fuel, and such spot demand as does exist is being readily taken care of.

The general improvement in business conditions has resulted in many industries increasing their working schedules to a point beyond that anticipated by them some weeks back and consequently, they have entered the market with inquiries. The output of stripping operations in eastern Ohio is estimated at 10,000 to 15,000 tons per week and it is reported that union miners around Martins Ferry and Bellaire have conducted demonstrations against employees of some of the stripping mines with a view to closing them down, but without much effect.

Because of the unsettled conditions in the coal trade, little interest is being manifested in Lake shipping. Permits have been issued by the Ore & Coal exchange for some 2,000,000 tons. Most of the coal will be dumped by the end of the month.

Receipts of bituminous coal at Cleveland during the week ended April 15 amounted to 742 cars, consisting principally of coal from Ohio stripping mines and West Virginia non-union operations. Industries received 616 cars, retail yards, 128. This quantity is about 50 per cent of normal receipts which, coupled with storage fuel distributed throughout this section, results in an ample fuel supply.

COLUMBUS

On the whole little change has taken place since the suspension. The shutdown of certain Connellsville mines caused a steady demand for coal elsewhere. There was quite a buying movement on the part of iron and steel plants in the Ohio Valley region. There is still considerable coal on track at the mines and at junction points and in some instances it is rather difficult to dispose of.

Retailers are showing little concern over the situation and are not in the market to any extent. Most dealers are devoting their attention to cleaning up preparatory to the summer stocking season.

Lake trade is not showing any activity to amount to anything. Some cargoes are being loaded at the lower ports but the tonnage moved has been small in comparison with former seasons.

NORTHERN PANHANDLE

The only dents in production made by the strike are in Marshall County, but inasmuch as that county is a heavy producer this has cut production for the field in half. Some mines ceased to operate on April 1 because of lack of orders. One company has resorted to an injunction to prevent interference with its miners. During the second week of the strike, the demand became more pronounced and prices rose.

DETROIT

The market remains inactive. Very little inquiry is developing for either steam or domestic sizes. Apparently there is no pressing need for coal. Though incoming shipments are not very large, the supply is seemingly adequate to meet the requirements of consumers and jobbers say it is usually possible to find a little free coal on tracks when search is made for it.

Smokeless lump and egg is quoted $2.75@$3, mine run, $2, nut, pea and slack, $1.50. Four-inch lump from West Virginia or Kentucky is $2.50@$2.75, with 2-in. lump or egg around $2.25, mine run, $1.50@$1.75, nut, pea and slack, $1.40.

Cincinnati Gateway

With Heavy Outside Buying, Coal Speculator Reappears

Orders Traced to Pittsburgh Boost Prices on Byproduct and Steam Coals —Falling Off in Orders Causes Reaction in Quotations.

HEAVY outside buying has brought the coal speculator again into prominence in this market. Following on the heels of heavy purchases made in the interests of the Youngstown steel plants, orders that were traceable to Pittsburgh deliveries made an appearance here the latter part of last week, and as a result the prices on byproduct and steam coals forced themselves steadily upward. The price hung high for a day or two and with the absence of anything like the volume of orders that had been pouring in there was a slight reaction and by midweek the same coal could be bought a nickel to a dime under the high figure.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

New River production was larger by about 15,000 tons for the week ended April 15 than it had been at the outset of the strike. A slight improvement in market conditions had a tendency to stimulate production. Prices had advanced a little on smokeless mine run but not to as marked an extent as was true of high-volatiles.

Conditions had become somewhat more stabilized in the Gulf region, and some of the miners who had been influenced to cease work during the first week of the strike were back in the mines again, so that production was on a somewhat larger scale during the week ended April 15. Market conditions were a little better but the demand had not reached sufficient proportions to bring production up to capacity.

POCAHONTAS AND TUG RIVER

Pocahontas mines are turning out more coal than at any time during the year, the output having reached 75,000 tons a day during the second week of the strike. Miners are showing no inclination to cease work but on the contrary are helping to speed up production. A betterment of market conditions was reflected in the decreasing number of set-outs at Portsmouth and other points. Western buyers were seeking more smokeless and in the East, too, there was a livelier demand.

With the steel mills taking more coal and the general demand showing a good deal more life, it was possible for Tug River to speed up production. Byproduct coal is in fairly active demand. For the prepared grades there is comparatively little sale, however. Many of the mines in this region are operating to capacity. Man power is ample and no impression is being made by the strike.

HIGH-VOLATILE FIELDS

KANAWHA

Slight production gains were made during the second week of the strike. On an average, 20 mines were in operation from day to day except during the latter part of the week when Coal River reached the flood stage. Late in the week producers began to experience a heavier demand. Mine run increased to about $2.

LOGAN AND THACKER

Logan mines continued to break all production records. Every mine in the region was running and many were producing to capacity, in view of an improvement in market conditions. The western markets appear to be affected by a growing alarm over a shortage of coal. There was an advance of not less than 35c. a ton in mine run.

Thacker production was maintained throughout the week at about 400 cars per day. Production has not been affected by the strike. Market conditions are better and more coal is being sold on a spot basis but the demand is not brisk enough to materially increase the output. Some coal is being moved to the Lakes.

NORTHEASTERN KENTUCKY

Production on the Big Sandy was on a larger scale, averaging about 22,500 tons a day. There was a better demand, particularly for Elkhorn mine run which advanced to about $2. Some coal was consigned to the Lake. Prepared grades were hard to move. Only two or three mines in the entire territory were affected by the strike.

CINCINNATI

It is estimated that 5,000 cars have been picked up here for destination to the steel centers and it is said that an order for a like amount of coal to be shipped to Fort William for the account of the Canadian Pacific Railway, has been placed within the past few days. On top of this there has been a general opening of the Lake business with the Cleveland interests gathering several cargoes for shipment out of Toledo and Sandusky. This with the general flow of business has been enough to keep every office in this city on keen edge and busy.

Smokeless has gone through an upward gyration. The greatest influence back of this trend was a stiffening of business at Tidewater where an increased tonnage has been sent on its way to New York. Byproduct plants too, have been putting in their orders and some of the upstate dealers have been buying a little heavier.

Local retail prices have shown little or no change from the advance that has been made in a wholesale way. About the only difference in price is on bituminous slack which now commands $5, all of the lower priced coal of this type having been cleaned up. Smokeless lump is still held at $7.50 and the run of mine at $6.50. Bituminous lump brings $6.50@$6.75, with 25c. extra for hill top deliveries.

The recent high water has seriously impaired river shipments, few barges having come down for the past week.

SOUTHEASTERN KENTUCKY

Last week's advance has held good and there is no sign of weakening. In some cases prices are even stronger on mine run. Demand is mostly from steel mills and some little railroad business is coming into the field. All attention has been diverted to mine run and very little prepared sizes are being made.

About 75 per cent of the mines are now operating but are not making full time. This is due in most cases to part of the miners belonging to the union. So far, however, the union men have given little or no trouble and some are drifting back to work.

West

KANSAS CITY

The word "stagnation" describes the situation in the coal trade throughout the Southwest. Coal that was loaded at the mines before the strike, is still on track. Dealers in the country have ample stocks to more than meet the demand, and are not buying. Dealers in the larger cities are overstocked, but the last few days of cool weather brought some calls for coal in one- or two-ton lots. Consumers are buying only as they have to, expecting a reduction in the cost of coal.

Pre-strike prices prevail generally in this territory.

DENVER

Colorado is not handicapped through the nationwide coal strike. Wyoming, on the other hand, is hard hit, and operators are doing the unusual thing by shipping coal into that state. The summer shortage trade has been disturbed but the bituminous fields are making weekly gains in output. Lignite fields increases are not so marked.

Bituminous lump is bringing $5@[illegible] at the mine, and most lignite, formerly $5.75 is now $4. Weld county lignite lump is $3.50, retailing for $6.20@$7. Lignite slack is from 80c.@$1.20. Bituminous slack in the Trinidad district is $2@$2.50, retailing at $6. Walsenburg and Routt slack are $1.75@$2, retailing at $5.

Denver has eighty-two trackage yards owned by sixty-seven dealers, who are trying to determine how to curb the 131 coal peddlers who are as troublesome as snowbirds, though licensed by the city.

SALT LAKE CITY

The strike situation in the Utah fields is unchanged. According to an official of the State Industrial Commission, 30 per cent of Utah miners are out. There has been no violence and no public interest in the strike.

Sale Lake City is experiencing the coldest and stormiest April in many years, but there is no shortage of coal and dealers are doing a good business.

News From the Coal Fields

ALABAMA

The New Connellsville Coal & Coke Co., in the Birmingham section, is preparing to put in operation its battery of fifty beehive ovens, which have been out of commission for the past year or longer. The demand for furnace and foundry coke is improving and increased production is necessary to supply trade requirements.

J. B. McClary has been elected president of the Davis Creek Coal & Coke Co., with operations at Rock Castle, Tuscaloosa County, vice **J. C. Maben**, resigned. Mr. McClary is president of the Yolande Coal & Coke Co., and the New Connellsville Coal & Coke Co. The mines at Rock Castle have been idle for the last two years and plans for resumption of operations have not been decided upon as yet.

M. G. Hubbard, at present treasurer and general manager of the Sterling Coal Co., at Middlesboro, Ky., and formerly in charge of the mines of the Barney Coal Co., in Walker County, was in the Birmingham district recently.

ALASKA

Reports from B. W. Dyer, federal mine inspector, with headquarters at Anchorage, indicate a year of activity in the coal mines of the North. Coal from Alaska mines will be moving in regular shipments to Seattle within the next three months. The greatest activity is expected in the Matanuska fields, which if not operated by the Government, will be worked by private enterprise. Production in 1921 was 76,285 tons, valued at $467,994. Most of this tonnage came from the Mantanuska fields.

A modern coal washery was completed at Sutton in February, which will treat both Government and commercial coals. Sutton is at the Eska branch of the Government railroad and is the point where the coal to be shipped in May will be handled.

COLORADO

Colorado's production will be the smallest in more than a decade in 1922 if ensuing months show decreases similar to those recorded during January and February. Production during these months aggregated 1,591,943 tons as compared with 1,807,652 tons for a corresponding period last year—a decrease of 215,709 tons. The men employed in and about the mines dropped to 12,898 during February, and 9,000 in Mach, as against 14,000 in former years. The men averaged 32.2 working days during January and February.

CONNECTICUT

A. H. Powell & Co., New Haven coal dealers, have let the contract for the erection of a 12-story brick and fireproof constructed store and office building. The structure will cost in the neighborhood of $700,000.

The Patrick McGee Co., Bridgeport, with a bid of $12.95 per ton delivered, received the order for the next three months' anthracite supply for the city of Bridgeport for use in the municipal buildings.

ILLINOIS

As the result of a deal closed several days ago a syndicate of Eastern capital has assumed control over the properties of the **Kolb Coal Co.,** which owned and operated two mines at Mascoutah, the Fairbanks Mine near Lenzburg and the Vinegar Hill Mine near New Athens. Officers of the new company are C. C. Field, president, and F. H. McCauley, secretary, both of New York.

E. J. Scott, of St. Louis, president and general manager of the Scott-Smith Coal Co., St. Louis, visited southern Illinois recently.

The Old Colony Fuel Co., Chicago, recently filed articles of incorporation at Springfield. The incorporators were Samuel Susina, E. M. Frey and Ray C. Lyon.

The Louisville & Nashville R.R. has issued circular G. I. S. No. 141, dated March 25, 1922, showing the location and capacity of all the mines and coke ovens on the line of that road.

The hoisting record for the Danville district was broken the day before the strike started by the Vermilion Mine of the **United States Fuel Co.** at Danville. It hoisted 4,858 tons at a speed which brought a car to the surface every 14 seconds for 8 hours.

G. D. Cowin, sales manager of the Bell and Zoller Coal Co., at Chicago, is on a two-weeks' vacation.

Joseph Allen, of the Allen Coal Co., of Minneapolis, visited the Chicago coal trade recently.

George W. Reed, vice-president and sales-manager of The Peabody Coal Co. at Chicago, is vacationing at Hot Springs, Ark.

The Old Ben Coal Corporation's circular to its employes, issued at the time the miners of the country struck, is considered to be a strong and friendly presentation of the facts of the coal crisis in a way that may appeal to union men. Other operating companies are considering the issuance of similar matter.

Arrangements are being completed for the convention of the **International Railway Fuel Association**, to be held at the Auditorium Hotel, Chicago, May 22-25. The International Railway Supply Men's Association is arranging for exhibits and space is being taken rapidly. Entertainments are planned for Monday, Tuesday and Wednesday evenings, including moving pictures of coal mining operations, an informal reception and dance and a dinner.

Eleven locomotive engineers and eleven firemen, winners of high rank in the Southern Pacific Ry.'s fuel saving contest, will attend the convention in Chicago, May 22 to 25 of The International Railway Fuel Association at the expense of the company. Individual fuel performance records are kept daily on the Southern Pacific and a number of awards and medals are given periodically.

The Mount Olive & Staunton Coal Co., Mount Olive, has certified to the Illinois secretary of state an increase in capital stock from $500,000 to $1,500,000. Thomas F. Brewster is the president and C. R. Marter, secretary.

INDIANA

Given & Son, at Brazil, will take advantage of the strike lull in business to reconstruct the engine house and tipple at the mine north of Center Point, which was recently destroyed by fire. The owners expect to have the mine completed and ready for business by the time the strike is over and fall business starts in.

The Aetna Coal & Mining Co., of Indianapolis, filed papers with the secretary of state recently showing a change in name to **Star City Coal Co.**

KENTUCKY

George W. Johnson, for two years with the White L. Moss Coal Co., Pineville, and W. W. Landrum, a pioneer coal man of Harlan, have organized the **Cumberland Valley Coal Co.,** and will conduct their new business from an office in Harlan.

White L. Moss, state senator from southeastern Kentucky and president of White Moss Coal Co., has been visiting his company's branch office in Atlanta.

Kevitt-Jellico Coal Co., capital $10,000, has been incorporated by H. C. Kevitt and A. H. Davis, both of Jellico, Tenn., and T. A. Croley, Williamsburg.

MINNESOTA

Arch Coleman, a well-known coal dealer of Minneapolis, has been named as acting postmaster of Minneapolis. The naming of the permanent appointment will follow the civil service examination. Mr. Coleman is expected to be the winner.

The Minnesota Gas & Mineral Co., of Sauk Center, has filed articles of incorporation with $250,000 capital stock, to prospect for coal, gas, oil and iron. L. W. Gingerly is president.

MISSOURI

The Power Plant Equipment Co., of Kansas City, will represent **The Combustion Engineering Corporation** in eastern Kansas, eastern Nebraska, western Arkansas, and western Missouri. Headquarters will be in Kansas City.

The strip mine of the **Callaway County Coal Co.,** south of Fulton, was flooded by recent rains, in some places with 30 ft. of water. The stripping machinery was covered. Blasting removed about ten feet of water, but the rest will have to be pumped out, requiring some time.

A meeting of the stockholders of the **Raven Coal Co.** is to be held at Lancaster soon. The object is to obtain an increase of the bonded indebtedness in the principal sum of $50,000, and also to authorize the execution, negotiation and sale of the coupon bonds together with a deed of trust conveying all the property, real, personal and mixed, of said corporation in trust, to secure the payment of said bonds and coupons.

Due to the coal strike and to the exhausted condition of the mine the **K. C. Midland Mine No. 4** at Novinger, has been closed and abandoned. This mine was in operation eight years. Part of the machinery will be used in the K. C. Midland Co.'s Mine No. 7.

NEW YORK

The Coal Trade Club of New York held a luncheon on Wednesday, April 19, at the Whitehall Club. C. E. Lesher, editor of *Coal Age*, addressed the members on the present state of the coal industry.

The Interborough Rapid Transit Co. has 26,000 tons of coal at the power houses, 5,000 tons on barges and 16,000 tons at Hampton Roads. It is expected that 20,000 tons will be delivered to the company during the balance of April, making a total of about 67,000 tons equal to one month's supply. **The Brooklyn Rapid Transit Co.** has on hand about 58,000 tons, or about 60 days' supply. Of this about 11,733 tons are at the Williamsburg Power House, 7,580 tons at the Central Power House and 20,488 tons at the Rossville Staten Island storage plant.

The Federated American Engineering Society's unemployment service, in the conduct of which the big so-called Founder Societies share, has placed 870 men in engineering positions since Jan. 1. At present from ten to fifteen professional engineers a day are finding places. Most of these are university and technical school graduates. The fact that more engineers are returning to active work, it was pointed out, indicates that large numbers of men in subordinate positions are also necessarily obtaining work in the engineering and allied fields.

Reopening of the copper mines, and the relief which the mining industry in general is beginning to experience, according to recent announcements, has not produced any marked effect upon the unemployment situation among the mining engineers registered at the Federation's Unemployment Service, whose headquarters are in the Engineering Societies' Building, 29 West 39th St., New York City. Most of the calls for mining engineers, among whom conditions have been most acute, have come from South American countries. About 3,000 applications for work are now on file. This number has not increased during the last month, as it had during previous months.

OHIO

The Barnesville Fuel Co., Barnesville, has been chartered with a capital of $10,000 to do a retail coal business. The incorporators are Otto Medley, R. J. Foose, C. W. Chalfant, Blanche S. Chalfant and Mary O. Foose.

The Ohio-Tennessee Coal Co., Covington, has been chartered with a capital of $10,000,000 to operate coal mines and deal in coal properties. Incorporators are D. G. Wenrich, Charles H. Jackson, Ellis G. Eyer, John P. Harris and L. B. Jackson.

With the last pay distributed April 10 to miners in the Hocking Valley and southern Ohio fields, wholesale grocers and supply houses which cater to the mining districts predict a big slump in business. Already many wholesale houses are exercising extreme care in extending credit to stores in mining sections. In all about $800,000 was distributed April 10 which represents the earnings of the men during the last half of March.

R. H. Hoykin, manager of the Ft. Dearborn Coal Co., at Cincinnati, has resigned and goes with the Stonega Coal & Coke Co., as assistant sales manager in the southeastern territory. **E. P. Liska** also has resigned and has gone to Toledo. **M. R. Fitzgerald**, of the same company, has returned to the Chesapeake & Ohio with which he was affiliated before joining the forces of the Fort Dearborn company.

Recent visitors from Detroit to the Cincinnati market were: **H. H. McKillip**, president of the International Coal Co. **Joe Dykstra**, of the Dykstra Coal Co., **George Agnew** of the Agnew Coal Co., and **R. F. Johnson.**

Columbus offices of the **Philadelphia & Cleveland Coal Co.**, which has headquarters at Cleveland and a branch at Columbus under the charge of P. A. Coen, vice-president, will be moved into larger space in the Rowlands Bldg., about May 1.

The Permanent Coal & Supply Co., Cleveland, has been chartered with a capital of $50,000 to do a retail coal business. Among the incorporators are W. W. Wagner, and F. J. Ketcher.

Owen M. Rederick has been named as receiver for the **Big Mine Coal Co.**, upon petition of three stockholders of the company. The company was incorporated a year ago by J. B. Patton, Charles W. Patton and Herbert A. Kinney. Bentley Scarborough and H. C. Wheeler, of Akron, and W. D. Scarborough, of Woodfield, who filed the petition for receivership, seek recovery of money said to have been invested by them in stock in the company.

OKLAHOMA

All men employed in the mines of the **Rock Island Coal Co.**, near Hartshorne, have obeyed the strike order. Announcement is made by the company that its plant will be renovated and put in first-class order during the period of idleness. Announcement as to the nature of additions and new equipment has not been made, but it is understood that some of the old equipment will be displayed by new.

PENNSYLVANIA

A big coal transfer was recorded in Fayette County recently when Logan Rush sold the **Georges Coal Co.**, located in Georges township, to **A. S. Livengood** and **C. L. Keedy**, both of Scottdale. While the figure was not made public it was said to involve $150,000. The property includes 80 acres of coal located along the Baltimore & Ohio, about a mile and a half from Fairchance.

Preliminary information from Harrisburg, indicates that the working time of the anthracite mines in 1920, as computed by the State Department of Mines, was 267 days, while the tentative figure for 1921 is reported to be 257 days.

In response to a request from counsel, the U. S. Supreme Court directed that in the re-argument of the Reading case recently, special attention be given to the following:

(1) Whether the disposition by the Reading of the coal and iron company stock, as contemplated and ordered in the District Court decree, will establish such entire independence between the Reading Company and the coal company as required by the opinion and judgment of the Supreme Court.

(2) Whether there is any legal or practical difficulty in modifying the decree so that the coal company stock owned by the Reading Company may be sold free from the lien of the old general mortgage and from the lien of the proposed new mortgage.

(3) Whether compliance with the decree would benefit any class of Reading stockholders to the prejudice of another class.

(4) What is the basis upon which the amount and character of payments to be made by the coal company and the new company to the Reading Company were determined, and what are the reasons for adopting it.

The Pennsylvania Company for Insurances on Lives and Granting Annuities has received permission from Judge Wilhelm, of the Schuylkill County Orphan's Court, to sell the interest of its minor ward, Oglesby Paul, amounting to 28 per cent of 174 acres and 35 per cent of 68 acres in Pottsville and Mecanicsville, to the **Hudson Coal Co.** The property is in the east end of Pottsville and Palo Alto, and the total area is to be sold for $115,000.

Allan C. Frazier, formerly of Weston-Dodson & Co., has been engaged as manager of coal and coke sales of the Iron Trade Products Co. for the Philadelphia district, with headquarters in Philadelphia.

The Chain Belt Co. has announced the appointment of **G. F. Sherratt** as manager of the Pittsburgh office in the Union Arcade Bldg.

E. C. Dodson, for several years connected with the Grazier Coal & Coke Co. and the Grazier Coal Mining Co., as secretary-treasurer, has severed connections with both companies, and is now associated with the firm of Branson, Long & McFadden, Inc., Philadelphia, as field manager. Mr. Dodson will occupy an office in Johnstown.

Governor Sproul has appointed **John D. Walker**, Nettleton, as a bituminous coal inspector for Cambria County.

The Dauphin County Commissioners have reduced the taxable assessment on the buildings of the **Susquehanna Collieries Co.** from $186,740 to $125,000, but they denied the company's claim for an assessment rebate of $93,000, representing the assessed valuation of a million and one-half tons of coal removed from the company's grounds in the past three years.

M. L. Taylor, vice-president of the Morgantown Coal Co. of Morgantown, was in the Pittsburgh market late in March.

TEXAS

The Empire Fuel Co., owning lignite mines in Milam County and maintaining executive offices in Dallas, has increased its capital from $1,000,000 to $5,000,000 and changed its name to the **Empire Fuel Corporation.** The purpose of the company is to manufacture fuel for industrial and domestic purposes from Texas lignite.

The Railroad Water & Coal Co., of Chicago, has been granted a permit to do business in Texas. The company will maintain headquarters at Bridgeport, with R. E. Toliver as state agent.

VIRGINIA

The City of Norfolk has awarded a contract for 12,000 tons of coal to **Nottingham & Wrenn**, of Norfolk, at $1.74, to be supplied 1,000 tons a month. This firm was the lowest bidder on the high-grade navy standard coal purchased.

W. W. Houston, of the Panhandle Coal Co., has been made chairman of a membership campaign of the Chamber of Commerce at Norfolk, which will make a thorough canvass of the city with a view to adding 1,000 members to that body for better port exploitation work.

WEST VIRGINIA

A visitor in the Fairmont region about the middle of April was **R. C. Salkeld** of the Verner Coal & Coke Co. and the Salkeld Coal Co.

Duncan Sinclair, well known in Fairmont coal trade circles has returned from a business trip to Costa Rica.

With a full force of deputies and state police on hand to preserve order, the Parr's Run mine of the **Mineral State Coal Co.** resumed operation at Moundsville on April 17, after having been shut down for two weeks for repairs to the cage which hoists the coal from the bottom of the mine to the tipple.

John F. Phillips, president of the Delmar Coal Co., with headquarters at Fairmont was enjoying a fishing trip on Elk River during the latter part of April.

C. W. Watson, president of the Consolidation Coal Co., with headquarters at New York, was a recent visitor at Fairmont.

Pittsburgh coal land in Harrison County was sold early in April for as high a price as $2,000 an acre. The sales were made of lands on Bingamon Creek in Eagle District, two tracts changing hands. **The Howard Coal Co.** secured from T. S. Hardesty and wife and from Dora B. and C. D. Robinson 10.14 acres. The same company also purchased from Mr. and Mrs. Hardesty 16.71 acres of land in Eagle District, underlying which it is estimated there are 7.40 acres of Pittsburgh coal.

Vice-President C. E. Hutchinson of the Hutchinson Coal Co., of Fairmont, has returned from a visit to the New York market.

Clarence D. Robinson, one of the well known operators of the Fairmont region, has returned from a business trip in the East.

The Jamison Coal & Coke Co., operating in Pennsylvania and West Virginia, and with general offices at Greensburg, Pa., has added materially to its holdings in West Virginia through the acquisition of 728 acres of Pittsburgh coal in the Fairmont and Lincoln districts of Marion County. The coal is convenient to development since it lies between the No. 8 and the No. 9 mines of the company. The company paid $426,820 for this coal, securing the land from Phillip Sisler and Nancy Trader.

The Mabscott store of the **New River Company**, operating in the New River field, was entered early in April and rifled of all canned goods and provisions. Those who entered evidently were prompted more by a desire to secure provisions than to secure anything of tangible market value. The company has been unable to fix the responsibility for the robbery.

Huntington is to be the headquarters of the newly organized **Huntington Coal & Distillation Co.**, which has a capitalization of $25,000. Having an active part in the organization of the new concern were L. W. Blankenship, S. S. McNeer, F. M. Livezey, H. Weddell and M. L. Burnett, all of Huntington.

J. J. Mulvehill, who for several years has been the secretary of the Northern Panhandle Operators' Association, with headquarters at Wheeling, has severed his connection with that association, to become the chief clerk of the Consolidation Coal Co., in its new Pocahontas division. His new appointment became effective on April 10.

Secretary George S. Brackett, of the Northern West Virginia Coal Operators' Association has returned to his headquarters at Fairmont after a visit to Washington, where he testified before the Labor Committee of the House of Representatives.

W. E. Watson, of Fairmont, president of the Fairmont & Cleveland Coal Co., and of the Monongahela Coal Association, has returned from a business trip to Pittsburgh.

Taking advantage of the opportunity afforded by enforced idleness, many of the companies in Monongalia County are making needed repairs and are using their monthly men in cleaning up, overhauling machinery and the like in preparation for the resumption of operations at such a time as it may seem expedient. For instance, the **Soper-Mitchell Coal Co.** is installing shaker screens at its Jere mine.

ALBERTA

The Board of Conciliation appointed by the Government under the Industrial Disputes Act to inquire into the coal strike in District 18, comprising the southeastern British Columbia and Alberta coal field, held its first sitting on April 10. It is composed of W. E. Knowles, of Moose Jaw, chairman, and R. G. Drinnan, Edmonton, representing the operators, and H. Ostlund, of Lethbridge, representing the miners.

William P. Hinton, formerly vice-president of the Grand Trunk Pacific Ry., who was superannuated after 35 years of service, has been appointed general manager of the Cadoman coal properties in the Rocky Mountain district, south of Edson.

BRITISH COLUMBIA

At a meeting of the Associated Boards of Trade of British Columbia, held at Victoria, **Thomas Graham**, general manager for the Canadian Collieries (Dunsmuir) Ltd., introduced a resolution, urging the Government to place an increased duty on fuel oil. In support of the resolution, Mr. Graham stated that more than 350,000 barrels of fuel oil were imported monthly, and that a million dollars went out of the province each month for oil, displacing 100,000 tons of coal. An adequate duty on foreign oil, Mr. Graham claimed, would result in the retention of $12,000,000 annually in the province and add $5,000,000 to the payroll of the Vancouver Island mines. Mr. Graham failed to carry his resolution on the first day of the meeting, but on bringing it up again on the third day, on the ground that unfair discrimination had been shown by the meeting in passing a resolution advocating increased duties on the products of the Trail smelter, Mr. Graham succeeded in carrying it. It is exceedingly doubtful, however, whether the Government will comply with the request. It is argued by many that if the coal operators seriously desired to compete with fuel oil they could do so by reducing the price of coal.

NOVA SCOTIA

An investigation was held on April [illegible] by H. Donkin, Deputy Minister of Mines for Nova Scotia, into a case of alleged sabotage at the Caledonia colliery at Glace Bay. Some weeks ago where the policy of "striking on the job" was in operation mine examiners reported finding the doors of air passages in the mines "spragged" or jammed in such a manner as to prevent the circulation of fresh air, placing 300 miners in danger of suffocation. The discovery was made a short time before the men went down into the pit. Sixteen witnesses were examined but the identity of the perpetrator of the outrage was not discovered.

A new difficulty has arisen in the tangled Nova Scotia coal situation in the form of a faction fight in the United Mine Workers over the appointment of Isaac McDougall of Inverness, to represent the 12,000 miners of Nova Scotia on the new Conciliation Board which is to rehear the wage dispute between the **British Empire Steel Corporation** and its mining employees.

ONTARIO

The Chisholm Coal Co., Oakville, is planning to erect a new coal storage plant to be located along the Grand Trunk tracks.

The Port Stanley Nukol Co., bondholders at a recent meeting at Toronto refused the offer of $10,000 cash or $34,000 bonds in a company organized to take over the assets, for the plant of the company at Port Stanley. The London and St. Thomas yards have been sold. N. S. Cornell, president, and E. D. Post, manager and secretary, were examined to ascertain what had become of the $200,000 invested by the company in stocks and bonds. The 300 bondholders represent $170,000. Mr. Post stated that it had been demonstrated in Ontario that briqueting was not profitable, the Port Stanley company having lost 31c. on every ton produced.

WASHINGTON, D. C.

The Monongahela Coal Association has applied for membership in the **National Coal Association.** The application will be passed on at the next meeting of the Board of Directors. No date for a directors' meeting has been set prior to the annual meeting the latter part of May.

In a report to Congress urging the establishment of an adequate merchant marine to provide for the import and export trade, the Shipping Board refers to the inconvenience arising from requisition of ships registered under foreign flags owned by Americans. It points out that ships of the Berwind White Coal Co., operating under the British flag, were requisitioned by Great Britain during the war. The board also recommends that merchant shipping should handle Government business, including the movement of coal required by the Navy and other Government services.

Naval authorities told the House Appropriations committee **during consideration of the naval appropriation bill** that Hampton Roads was the cheapest place for the Navy to secure its coal supplies, due to its close proximity to the West Virginia and Pennsylvania mines. Secretary of the Navy Denby said he was opposed to buying foreign coal for American naval vessels. Representative Kelly, Michigan, in charge of the bill, said there was no sense in carrying coal from Hampton Roads to China at a cost of $20 a ton if the Government could save $6 a ton by buying foreign coal.

In a decision by Justice Holmes, the Supreme Court recently held that the **Northern Coal Co.** was entitled to recover damages from the Cape Cod & New York Canal Co. for the loss of a cargo of coal on a barge which was stranded in the canal. The lower courts had decided against the right of the coal company to recover, but the Supreme Court sent the case back with instructions that damages be awarded the coal company.

Traffic News

In the complaint of the **Roundup Coal Mining Co.**, the Director General of Railroads has asked for a rehearing. The commission had found that the rates on coal from Roundup and Geneva, Mo., to destinations in North and South Dakota to be unreasonable and unduly prejudicial. Defendants contend that the record does not justify the reductions ordered by the commission, that the basis of rates from Roundup is lower than that required from Duluth by the commission in the Holmes & Hallowell case, that conclusions in that case have been disregarded, that the rates required have led to requests for a reduction in the Sheridan rate which was established by the commission, that rates established from the West into South Dakota are lower than those which apply from the East for similar mileages, and that the rates found reasonable by the commission are too low and will further deplete the carriers' revenues in South Dakota which are not sufficient at the present time.

The commission has assigned the complaint of the **Kanawha Black Band Coal Co.** for hearing **May 8 at Charleston, W. Va.,** and an investigation of rates on coal from the Southwest to Omaha and related points **May 9 at Kansas City.**

The Panama R. R. Co. has issued Supplement No. 11 to Tariff No. 5—Coal—superseding Supplement No. 10 to Tariff No. 5.

After an investigation by the **Wisconsin Railroad Commission**, which extended over eleven months, a general reduction in freight rates on hard and soft coal from Milwaukee, Sheboygan, Manitowoc and Green Bay to interior points has been ordered. The order materially changes the group system. Most interior grouping is abolished and localities are given the benefit of their proximity to ports. Green Bay and Manitowoc are taken out of a part of southern Wisconsin and Milwaukee is taken out of the grouping basis on the Fox River valley north of Neenah and Menasha. For the first 10 miles the freight rate on soft coal is set at 75c. a ton and for hard coal 90c. This rate increases for each 10 miles by approximately 10c., so that for a 50-mile haul the rate on soft coal is $1.20 and on hard coal $1.37; for 100 miles the rate on soft coal is $1.66 and for hard coal $1.84; for 150 miles the rate on soft coal is $1.92 and for hard coal $2.24; for 200 miles the rate on soft coal is $2.25 and for hard coal $2.60, while the maximum haul of 220 miles has a rate of $2.35 for soft coal and $2.75 for hard. The new rates are effective May 28.

Association Activities

Monongahela Coal Association

Questions of current interest to members were discussed at a meeting of the executive committee of the association held at Morgantown during the second week of the strike, at which time the question of resuming operations or making an attempt to resume operations was discussed. No association action was taken on this question, owing to the fact that there is a division of opinion among the operators as to whether the time has arrived to make any effort to start the mines again. In view of this, whatever action is taken will be on the individual responsibility of members. A number of the operators in the Scott's Run field are anxious to get started and several have under serious consideration the question of a resumption in the near future. Some operators took the precaution more than a month ago of serving eviction notices on their employees so that if a decision is reached on the part of any companies to operate, it will be possible to secure possession of houses now occupied by strikers for the use of working employees.

Obituary

Arthur F. Rice, who for many years was commissioner of the Coal Merchants' Association of New York, died at Los Angeles, on April 17. He, as a young man, entered the employ of the Erie Railroad, in the coal freight department. Later he went with the wholesale coal firm of Leonard & Youngman, and then Meeker & Co., where he remained twelve years. In 1907, he became commissioner of the Coal Merchants' Association. The funeral was held in New York City on Wednesday April 26.

George T. Cutts, recently controller of the Missouri, Kansas & Texas R. R. Co., died at his home in St. Louis recently after a long illness. He is survived by a widow and a son. He was one of the best known coal operators in the Middle West over a long period of years, having been vice-president and general manager of the Consolidated Coal Co., of St. Louis, until 1904.

Augustus B. Meyer, president of the A. B. Meyer Coal Co., of Indianapolis, died recently after a long illness. He first entered the coal business in 1877 by purchasing a small coal yard, beginning his operation on a limited capital. At the time of his death he operated one of the largest wholesale and retail coal business and material supply business in Indianapolis. Mr. Meyer became interested in the production end of the coal business in 1902 and associated himself with the United Fourth Vein Coal Co., Green County. He was elected president of the Western Coal Dealers' Association in 1886 and was one of the organizers of the Michigan and Indiana Retail Coal association.

Walter Ferguson, one of the three partners who constituted H. C. Frick & Co., now the H. C. Frick Coke Co., a subsidiary of the United States Steel Corporation, died at his home in Stamford, Conn., April 8. His brother, Edmund M. Ferguson, and Henry C. Frick, were the other partners. He was one of the organizers of the Brooklyn Edison Co., Brooklyn, and the founder of the Kings County Electric Light Co., which now is part of the Brooklyn Edison Co. He also was active in organization of the Union Carbide Co., of which he was a director, a position he also held with the People's Gas Co., Chicago, the Virginia Iron, Coal & Coke Co., Roanoke, Va., the Virginia & Southwestern Ry., and the Detroit & Mackinac Ry.

Coming Meetings

National Retail Coal Merchants' Association. Fifth annual convention at the Drake Hotel, Chicago, Ill., May 18-20. Executive secretary, Joseph E. O'Toole, South Penn Square, Philadelphia, Pa.

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

Missouri Retail Coal Merchants Association will hold its annual meeting May 16 and 17 at the Planters Hotel, St. Louis, Mo. Secretary, F. A. Parker, Arcade Bldg., St. Louis, Mo.

National Coal Association will hold its annual meeting at Congress Hall, Chicago, May 24 to 25. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham.

The American Wholesale Coal Association will hold its annual convention at Detroit, June 6. Secretary, G. H. Merryweather, Union Fuel Bldg., Chicago, Ill.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 16, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at the Stacy-Trent Hotel, Trenton, N. J., June 7 and 8.

Retail Coal Dealers' Association of Texas. Seventeenth annual convention at Greenville, Tex., May 15 and 16. Banquets on both nights will be tendered the association, that on Wednesday night being given by the Greenville Chamber of Commerce and on Thursday by the Wholesale Coal Men. Secretary, C. R. Goldman, Dallas.

American Society of Mechanical Engineers. The spring meeting will be held at Atlanta, Ga., May 8-11. Preliminary events will be held at Charlottesville, Va., May 5 and 6, in cooperation with the Virginia section of the A. S. M. E. Immediately following the Atlanta meeting observation tours will be made to points in the South, including Birmingham, Greenville, S. C., Muscle Shoals and Pensacola, Fla. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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Policy Not Wrong But Inadequate

OUR Washington correspondent this week points out that "the tactics of the [bituminous] operators are criticized on the ground that they seem to be engaged principally in denying everything that is said which reflects in any way on them. They seem to be striving strenuously to establish their entire blamelessness and to prove that there is absolutely nothing wrong with their own policies."

As a broad generalization this is true. It is true because the soft-coal producers have no organized national expression on labor questions. The officers of the National Coal Association appear before public bodies, make speeches, write articles, explaining away the charges of the miners and answering the questions of an impatient public.

What else can they do? By process of elimination, that is all that is left for them to do. The coal operators have no labor policy, no program for working out the present trouble. The non-union operators have a common policy of staying non-union, and the union operators work, think and act independently in each field, even by groups in each field. They do not allow, nor, of course, will the non-union operators permit, their common national association to formulate policy or express opinion as to labor matters.

Individually the operators speak up and speak plainly, but always as individuals. They do not all speak the same story or advance the same ideas and their scattered efforts lack the weight and force of organized expression. They have no common purpose on these matters.

How silly, then, is the propaganda of the United Mine Workers which says that the "trust-busting interests" of the country—the "predatory capitalists"—are guiding the bituminous industry through this strike with a resolve to destroy the union, to make slaves of the workers and to despoil the public.

Overcapacity—Should It Be Prevented?

COMMENTING on the testimony of Mr. Morrow before the House Labor Committee in which it was stated that the existence of many more mines than are normally needed to supply the nation is "the chief safeguard of the consumer," the *New York Times* says that the cost of each ton of coal is thereby "proportionately enhanced, and to suppose that the difference is not passed on to the consumer is, if you will, sheer nonsense." The *Times* says that the statement would be true enough if the only factor in the price were the number of mines in operation, but labor, it adds, also is a necessary—indeed, the main—factor. With one-third more mines than the country needs and sufficient miners on hand to operate these mines there are "long stretches of unemployment," and wages have been increased "so that 200 days of work will support the miner throughout the year."

What the *Times* has overlooked, apparently, is that we cannot have a highly competitive industry such as bituminous coal without large overcapacity. Just as a majority of the miners are unemployed for a considerable portion of each year, so a considerable portion of the capital invested in the mines is unemployed, and unemployed labor and unemployed capital represent loss if not, indeed, waste. Were the industry so organized that only those mines and that mine labor were engaged in the production of coal that was necessary to meet the current and even the peak demand, it were necessary that there be some controlling organization so placed or so powerful as to prevent initiation of new enterprises. Such a condition can be brought about two ways in the bituminous industry: by private monopoly or government control.

Either means higher prices to the consumer. Government control, regulation or operation is notoriously wasteful. Were the government to take charge of the coal mines, the consumer would pay more either through high prices or increased taxes. Were the bituminous coal industry a private monopoly the consumer would pay more for its coal because a monopoly always exacts a profit and the bituminous coal industry as a whole has never paid a reasonable profit over any ten-year period since its inception.

That Thirst for Facts

FACT finding for coal has become the war cry of the miners' union and a host of others. If the coal operators will but join the chase we will have the full pack in hot pursuit.

The coal operators are just as interested in the facts as any others, of course, and the reason they have not whipped themselves to a fury in the pursuit is that they at least have some perception of what a complicated business is that of mining and marketing coal. They have not, in the aggregate, more facts than the public and the miners but they know better what the facts mean. The producer of coal perceives the instant it becomes a fact that the price of coal is going down and he knows that he must meet the market—that is, if he is a producer of bituminous coal. If, under such conditions as obtained in 1921, he has non-union labor he takes advantage of the flexibility of his wage scales and cuts his wages and costs to meet the competition of others; if he has union labor he loses business and frets under the inelasticity of the union wage scale.

As a general rule the coal operator has no more facts about what the rest of the industry is doing than has the miner and the public but he has learned to interpret those facts. That is his business. That many producers are poor readers of facts does not impair this generalization. What the coal operator has not generally recognized is the reason for the eternal cry of those outside the industry for information. He has been and still is loath to concede that his business is anything but his business. He is quite frank about this and he wants to know why the government, for instance, should pry any more into his affairs than into those of other business. He is above all honest in his assertion that he wants to run his industry, and not turn it over to either the United Mine Workers or to the bureaus of the government at Washington. Furthermore he is honest in his conviction that if it comes to either, he will let Uncle Sam have it rather than the union.

There is ample reason to believe that were every fact, figure and decimal point for which there is such a cry, now available with respect to coal, the real issues before the coal industry would be as difficult of settlement. Hundreds of millions of dollars and decades of time have been consumed in collecting every conceivable fact about the railroads. Laws have been passed and enforced—yes, even to compelling Henry Ford to divulge the fact that his road was losing money—for the collection of mechanical, financial and operating facts about transportation.

With all these data—more than any human can compass—organized, tabulated and assimilated, there is no unanimity of either expert or of public opinion with respect to the railroad situation. A committee of Congress has been hearing testimony based on these facts for months, the Interstate Commerce Commission is wrestling with a million or more words of record and the Railroad Labor Board is at it perennially. And yet we are as much in the dark as ever as to whether it costs the consumer 4½c. or $2 to transport the goods for a suit of clothes from Chicago to Omaha. We perceive the difficulty of the commission in deciding whether the facts justify a lowering of freight rates, and of the Labor Board in finding whether wages can be reduced. Facts they have and power to get more. It is not so much fact finding that takes the time and is the concern of these sundry agencies dealing with the railroads; it is policy finding.

There is available a considerable array of facts about coal; doubtless more than about any other large industry save the railroads. For the practical purposes of the present argument about coal there are abundant figures respecting production, distribution, stocks, prices, profits, wages and earning of mine labor, though one may well desire more refinement here, more completeness there, and more frequent data on other points. There is hardly an aspect of the question, however, that is not covered in part. What, then, is the foundation—the motive—of the cry for "Compulsory Information in Coal"? Despite the list of subjects with respect to which Mr. Brophy calls for "facts" in his recent pamphlet, there is really but one point on which he desires to have more light, and that is profits of the operator. His suspicion that the coal producer reaps tremendous profits was voiced in his tirade against Dr. Garfield on Thanksgiving eve of 1919 in Washington. The same spirit was manifest by the miners in the hearings before the Thompson anthracite commission in 1920.

The pity of it all is that were there made available every single solitary "fact" that is called for, Mr. Brophy and those who think as he does would not be convinced of anything. For most people opinion is weightier than facts and facts are facts when you want them to be so.

Clean-Up Week

IT IS to be hoped that clean-up week has not almost passed without its due observance in our mining towns. After all, cleaning up is no less necessary when the mines are idle than when they are working. In fact, as fire risks are greater when a property is idle, the duty to clean up is more imperative than ever. The out-of-door works of the mine should be put thoroughly in order so as to make fire less likely.

Any brush piles left in construction work should be cleaned up discretely fired. Props should be properly stacked and collections of bark removed. Last year's dried grass and dead weeds, which would burn furiously if ignited by a match or by fires in the woods, should be cleared away. Brush should be cut near buildings and prop piles and the ground carefully scraped free of burnable material.

During the strike, temporarily constructed buildings can be finished and painted, or torn down and replaced. Tipples and sheds need roofing and repainting. The work should not be delayed, for during the rush of resumption, scaffolds and ladders will be in the way. Unfortunately, timber decays and roofs become leaky even though the works be idle.

Certain coats of paint and roofs of buildings at your works have arrived at the age when they cease to give adequate protection and they should be renewed entirely without regard to the running of the mines or the income derived from the investment. If the buildings are to be used hereafter they must be painted regularly despite the biennial disagreements between capital and labor, regarding which they know nothing. This is true of houses as well as of mine buildings. Unfortunately, there is no set day for painting. It is a form of insurance that does not run out suddenly after a given term of years. Today we have fire and life insurance, and if our insurance expires tomorrow the next day we will be uninsured. Paint insurance runs out more slowly though with equal certainty. To carry the simile further, the terms on which the losses are settled for decay due to the failure of paint gradually decreases as the insurance runs out by the drying out and the chemical changes of the oils in the paint. Consequently as this form of insurance does not have a definite day of expiring we like to let it run for every excuse or none till finally the paint is utterly unable to protect the houses and the appearance of the village is discreditable to its owners.

The frost has now left the ground. An excellent opportunity is given for sewering that will free the village of stagnant water with its wealth of troublesome and unhealthful insect life. Ditching should be done even where the standing water is not in the village but in neighboring woods. Steady and energetic work cannot be obtained from men who are living with their families in surroundings that are not healthful. In too many mining camps flies are abundant, and typhoid in consequence frequently makes its appearance. A removal of the food for these flies will remedy the evil, and all accumulations of fly food, whether of human or animal origin, should be placed where they can be transmuted by the alchemy of air and sunlight into such forms as can furnish flies no sustenance. The time to fight insect pests is early in the season before any number of them are bred. Precautions taken in May will bring a much larger reward than when left till July, for by that time the families will have multiplied.

Methods of Mining That Enable the Pocahontas Region To Recover About 90 Per Cent of Coal[*]

Recovery Records at 94 Per Cent of Pocahontas Mines—Thinner Coal Gives More Complete Extraction—Coal Covered by High Hills—First Mining Exhausts from 40 to 55 Per Cent of Seam

By Thomas H. Clagett[†]
Bluefield, W. Va.

THE Pocahontas coal field comprises the area in Tazewell County, Virginia, and Mercer and McDowell counties, West Virginia, in which the Nos. 3 and 4 Pocahontas seams of bituminous coal are mined. It is a mountainous region with ridges that rise to heights of from 300 to 1,000 ft. above narrow valleys and, except for the areas occupied by a few poorly kept farms along the tops of the ridges or occupied by the mining and coking plants and villages, is wooded throughout. Coal was first shipped from this field in the year 1883, the mine producing it being located at Pocahontas, Va. There are now some 100 mines, of which about 95 per cent are drift mines. To the end of the year 1920 about 298,000,000 gross tons of coal had been produced and some 35,000 acres of coal had been mined out.

No. 3 seam is from 4 to 10 ft. thick, but in any particular locality the change in thickness is gradual, therefore the coal seam is fairly uniform. It has one streak of bone coal about 2 in. thick to which the coal adheres above and below. In parts of the field this bone is replaced by hard slate, usually from 2 to 4 in. thick. The seam has a slate or fireclay bottom and a drawslate top.

No. 4 seam is from 65 to 80 ft. above No. 3 seam, and is of minable thickness only in the western part of the field. Its thickness varies from 3 to 8 ft. and it has two streaks of bone coal, each from 1 to 2 in. thick. It has a fireclay or slate bottom and is overlaid by from 4 to 24 in. of a laminated coal and slate, locally termed "black rash," which is separated from the coal seam by about 3 in. of slate. This "black rash" averages about 25 per cent ash, but contains some clean coal.

The coal in both seams is quite soft. The cleavage rarely is sufficiently well defined to exert an influence on the mining. The overlying strata are slates, shales and standstones, the sandstones predominating, extending to heights of from 30 to 1,000 ft. above No. 3 seam. The strata directly over the drawslate of No. 3 seam, or the "black rash" of No. 4 seam, and up to the first sandstone usually are slates or shales. These are about 10 ft. in thickness over the thicker coal and decrease in thickness as the coal becomes thinner, sometimes disappearing altogether.

The seams usually dip enough to provide natural drainage, although there are many undulations, swags and basins where the water must be pumped or liberated by ditching. Explosive gas rarely is found except in the slope and shaft workings. The lands as a rule, including the surface, are owned by land-holding companies

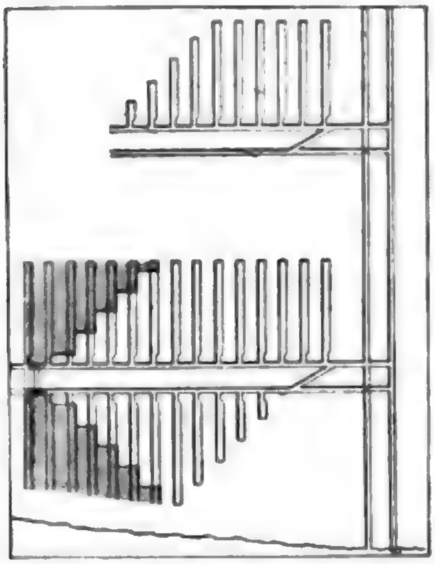

FIG. 1. FIRST LEASES PRESCRIBED THIS METHOD OF MINING

Rooms are opened on one entry advancing and on the other entry only after it has been driven the length desired. Those on the latter entry are opened on the retreat. All pillar drawing in both entries is done retreating also. Note the V break-line with its overloaded point located over the entry and also the temporary barrier pillar between pairs of entries.

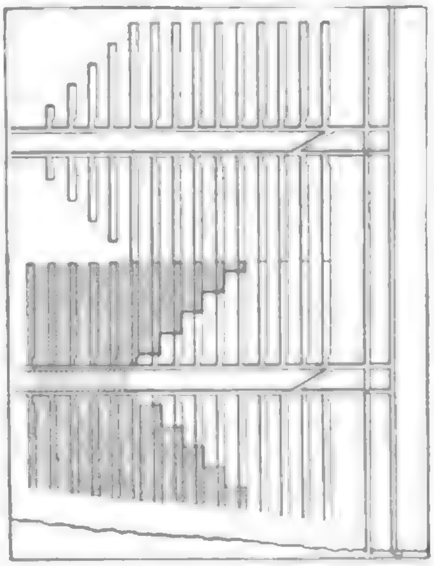

FIG. 2. ANXIETY TO GET OUTPUT EARLY FAVORED THIS CHANGE

All the rooms were driven on the advance and were allowed to stand until the entries were driven up, when pillaring commenced on the retreat, giving a V-shaped pillar line. The support given by the temporary barrier pillar between pairs of entries in the manner of working shown in Fig. 1 is in this plan no longer afforded and all the rooms are weakened by long standing.

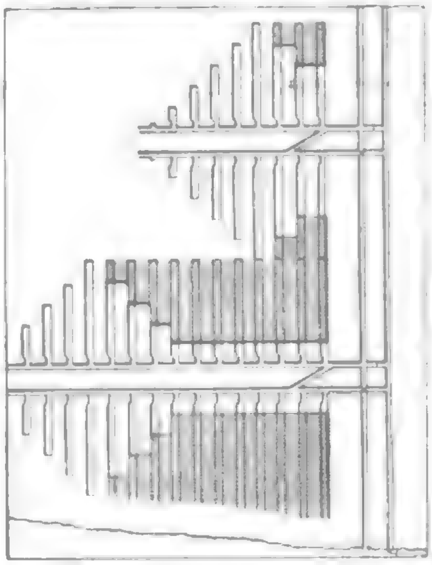

FIG. 3. BACK TO PRIMITIVE ADVANCING METHODS

Long lines of long-standing rooms stretching their length from one pair of entries to another as in Fig. 2 did not give satisfaction. It was thought better to draw the pillars as soon as they were finished and thus gain a surer release of pressure, for when coal is extracted simultaneously from the rooms between adjacent pairs of entries better falls are obtained.

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[*] Article entitled "Systems of Mining in the Pocahontas Coal Field and Recoveries from Them," presented to the American Institute of Mining and Metallurgical Engineers, Feb. 22, 1922.

[†] Chief engineer, Pocahontas Coal & Coke Co.

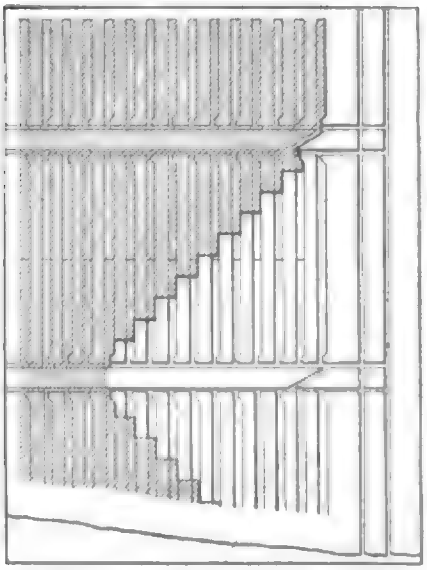

FIG. 4. PLANNING FOR LONGER BREAK-LINES IN PILLARING

The plan in Fig. 3 proved unsatisfactory, for the pillaring break-lines were not continuous and the entries were badly protected. Only in light cover was the right break obtained. So an effort was made to retreat from an inner heading first and to work out, thus giving a larger area of unsupported roof and a more certain cave.

and leased to operating companies on a royalty basis. The room-and-pillar system of mining has been universally adopted from the beginning as being best suited to all the conditions. The principal changes in the manner of its adaptation as mining progressed are shown by the following very general sketches of typical arrangements. Fig. 1 exhibits the system of mining that was made obligatory in the earlier leases and proposed to be followed, subject to such changes as would be agreed upon. It provided that entries and breakthroughs should be 10 ft. wide, entry pillars 60 ft. wide, rooms 18 ft. wide, and room pillars 42 ft. wide; that rooms from one entry of a pair should be turned and driven out progressively on the advance; that rooms from the other entry should be turned and driven progressively on the retreat, and that pillar mining should be deferred until the entries had been driven the intended distance and then should begin in the last pillars and be conducted on the retreat in both sets of pillars, the chain pillar of the entry being mined at the same time. In but few instances was this carried out in its entirety in practice, due apparently to desire for immediate tonnage.

The first change was to turn and drive rooms to their projected limits from both entries on the advance (see Fig. 2), and with few exceptions this was the adopted custom for a number of years. The first mines were in the thicker coal and it was considered good practice to leave from 18 in. to 3 ft. of top coal in openings to protect the roof against the disintegrating effects of atmospheric agencies and to reduce the amount of timbering otherwise necessary, it being the expectation that a large part of this top coal would be recovered when mining the pillars.

But the rooms in the first workings were driven much wider than had been anticipated, room pillars were correspondingly thinner, and there were many falls and squeezes. Few barriers, other than main-entry pillars, had been provided to prevent the spread of squeezes, and in consequence when they occurred they caused in many instances the indefinite postponement of pillar mining and the loss of much of the pillar coal and all of the top coal. Marked improvement was soon noticeable in spacing and widths of rooms, but the practice of leaving top coal continued wherever the seam was thick enough to permit it, and only a small proportion of coal so left has been recovered except over the roadways.

When pillars were mined the V-shaped breakline caused additional weight upon the chain piller at the apex of the "V," which was aggravated by a tendency to lag behind in mining the chain pillar, and frequently resulted in crushing portions of the chain pillar and the end of room pillars. Usually but a small recovery was made of the entry stumps and chain pillar and in many instances they were not mined.

An attempt was made to overcome the losses and inconvenience resulting from the delay in pillar mining by mining pillars on the advance (see Fig. 3), but, except where the rooms were unusually long and the cover light, an area was opened of insufficient size to cause the overlying sandstones to break, and a squeeze usually followed, causing loss of the entry stumps and chain pillar and spreading to the adjacent area when it was opened up.

Longer and more uniform breaklines were obtained by postponing pillar mining until it could continue in one direction over a larger area, as indicated by Fig. 4, or, when the grades were favorable, by Fig. 5. Frequent changes in the direction of the breakline were thus avoided, and the extent and shape of the area mined out were soon such as to cause a good break of the sandstone, but the orderly advance of pillar mining often was interrupted by falls, poor drainage or squeezes in the long-standing pillars, with consequent loss.

Driving rooms from both entries of a pair not only caused large areas to be opened up far in advance of pillar mining, with probability of losses, as stated, but frequently required that one set of rooms be worked to the dip, or else at an acute angle with the entry, in an attempt to keep above the strike line (see Fig. 6). Progress of dip rooms usually was delayed by water and changes in the direction of the rooms caused irregular breaklines in pillar mining.

The working of rooms from both entries of a pair therefore was discontinued as a general practice in favor of working rooms from one entry only (see Figs. 7 and 8), and although many mines continued to turn and work all rooms on the advance, others took advantage of opportunities first to drive room entries to completion and then turn and work out the rooms progressively on the retreat. This was followed promptly by pillar mining as indicated. Other changes were made from time to time and a variety of combinations as regards width, length and spacing of rooms used, but experience in the mining so far conducted and a study of methods of other fields with similar mining conditions had shown that economical pillar mining and a maximum recovery of coal required that rooms be opened up only fast enough to provide for the un-

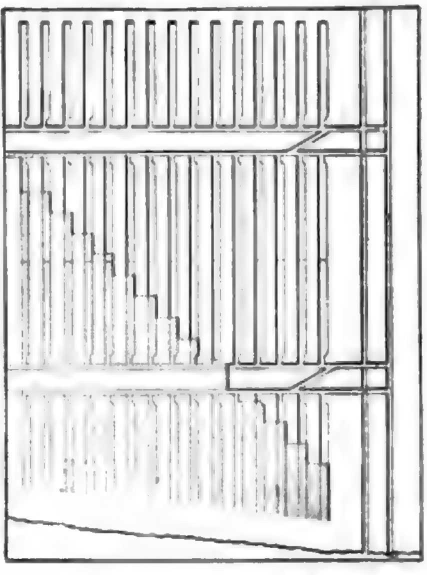

FIG. 5. WITH GRADES FAVORING, THIS PLAN PREVAILED

The method favored speedy output and gave a long break-line. The grades did not always favor its use, however.

interrupted advance of pillar mining, that pillars be mined promptly upon completion of rooms, that the line of pillar mining be carried forward uniformly in one direction until sufficient area was completely mined out to cause a good break of the overlying sandstones, that the direction of the breakline be varied as little as possible within reasonable limits, and that barrier and other pillars be of sufficient size not only to protect the workings properly but to admit of being satisfactorily mined when the time came to mine them. Most new development since the year 1900 has been laid out with these principles in mind.

Fig. 9, which already has been published several times,[1] was prepared by one of the land-holding companies in 1907 to show three prevailing adaptations of the panel system then in general use in many mines, but this plan, to conform to local conditions, tonnage requirements and individual preferences, usually was modified as to width, length and spacing of rooms and in various other ways.

WITH SPEED SMALLER PILLARS ARE PERMISSIBLE

Where pillar mining follows promptly, rooms from 14 to 24 ft. wide, depending on the character of the top, and spaced 60 ft., center to center, afford pillars of sufficient size to admit of successful pillar mining under any conditions of roof or cover yet encountered, and these are the widths and spacing commonly used, although there are numerous instances of greater spacing and some of greater widths. Where delays can be avoided, satisfactory results have been obtained with rooms as much as 36 ft. wide, spaced 90 ft., center to center, 800 ft. long, with two tracks in a room, but to obtain this result good roof, well and systematically timbered, and a high degree of supervision were needed. Under present systems from 40 to 55 per cent of the coal area actually opened up by the rooms and room entries is taken in the first mining.

The procedure indicated by panel No. 1 has been enlarged upon by continuing the entries indefinitely as shown in a very general way by Fig. 10, but illustrated in a comprehensive manner in a paper by W. H. Grady.[2]

Several land-holding companies and some operating companies, some annually and others every two years, determine the quantity of coal recovered from each mine per acre-foot of coal area exhausted, as taken from the mine maps, and calculate the percentage of recovery by comparing the tonnage mined with the theoretical tonnage contained in the same area, and also calculate the average recovery from the beginning of operations to the end of the corresponding period. Theoretical tonnage is estimated on the basis of one gross ton per cubic yard of solid coal, or 1,613.3 gross tons per acre-foot, corresponding to a specific gravity of 1.328. The specific gravity of Pocahontas coal varies from 1.298 to 1.330. Information shown by Figs. 11 and 12 is taken from the records of such companies as prepared and carried forward from year to year since 1890.

Fig. 11 shows graphically the average thickness of coal, the average recovery, in gross tons per acre-foot and also in percentage and the proportion of pillar mining, in sixty-seven mines or groups of mines, representing 94 per cent of the total production of the Pocahontas field to the end of the year 1920, the arrangement of mines or groups of mines being about in the order in which shipments were begun. It shows also the combined average of the mines opened in each 10-year period, as well as the combined average of all the mines. A summary of these averages, showing

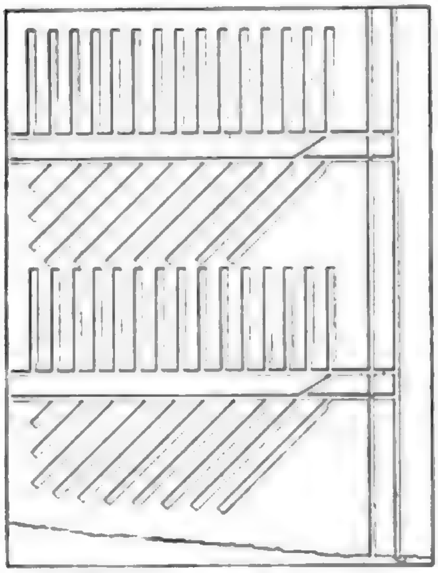

FIG. 6. DIFFICULTIES WHERE COAL WAS NOT LEVEL

Where the coal dipped the rooms were driven at less than a right angle from the roadway and in the direction of the strike-line. This practice resulted in irregular break-lines in pillar mining.

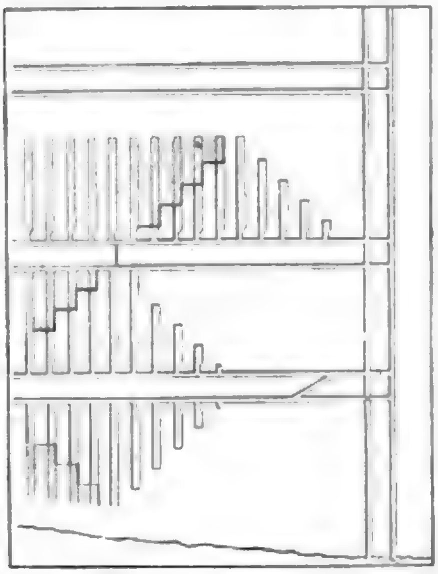

FIG. 7. ROOMS FROM ONLY ONE ENTRY COME INTO FAVOR

In this instance both room driving and pillaring are on the retreat, so that the pillars are drawn before the roof weakens. Only at crop, where roof breaks readily, are rooms driven from both entries.

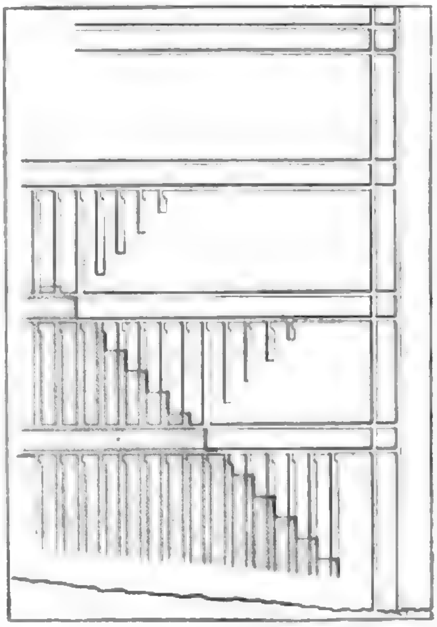

FIG. 8. ONE-WAY ROOM DRIVING WHERE MAIN ROADS DIP

The rooms are driven only as fast as it is proposed to pillar them, so that the rooms are in good condition when the pillaring commences and the solid coal extends almost up to the pillar line.

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[1] H. H. Stock, "Pocahontas Region Mining Methods," *Mines and Minerals*, Vol. 29, p. 395, 1909; Audley H. Stow, "Mining in the Pocahontas Field," *Coal Age*, Vol. 3, p. 594, 1913; W. H. Grady, "Some Details of Mining Methods with Special Reference to the Maximum of Recovery," W. Va. Coal Min. Inst., December, 1913; *Coal Age*, Vol. 5, p. 156, 1913; C. M Young, "Percentage of Extraction of Bituminous Coal with Special Reference to Illinois Conditions," Univ. of Ill. Bull. No. 42, Vol. XIV, 1917

[2] "Cost Factors in Coal Production," *Transactions*, American Institute of Mining Engineers, Vol. LI, p. 138, 1915.

also the coal area exhausted by the mines opened in each period, is as follows:

Mines Opened	Thickness of Coal in Feet	Gross Tons Recovered per Acre-foot	Percentage of Recovery	Proportion of Pillar Mining Per Cent	Coal Area Exhausted Acres
1883 to 1890	7.18	1,290	80.0	55	10,790
1891 to 1900	5.56	1,411	87.5	49	10,431
1901 to 1910	5.30	1,513	94.4	36	10,261
1911 to 1920	6.24	1,469	91.1	18	725
Grand av.	6.04	1,394	86.4	46	32,207

The thickness of coal as shown—on which the recoveries are based—is the full thickness of clean coal in the seam, except that for a number of years the top coal left in first mining was not included in the sections measured in the mines shown by columns 1, 2, 3, 4, 7, 8, 9, 13 and 55. The thickness of coal as shown for these particular mines, therefore, is somewhat less than the actual thickness and indicated recovery is correspondingly higher than the actual recovery.

On the other hand, coke was manufactured at all mines shown by columns 1 to 41, both inclusive, and columns 48, 49, 50, 52 and 53. Coal used in making coke was estimated at the rate of 1.6 tons of coal per ton of coke shipped, but under the conditions of coke manufacture in the Pocahontas field, 1.8 would have been a better factor. While this loss is not directly chargeable to recovery in mining, it is nevertheless included in the recoveries shown.

It may be noted from the thicknesses that the first mines were opened in the thicker coal and that subsequent development as a rule extended to thinner coal. It also may be noted that recovery increases as thickness decreases, as indicated by the averages of mines opened in the first three periods, and that recovery decreases as thickness increases, as indicated by the averages of mines opened in the last period.

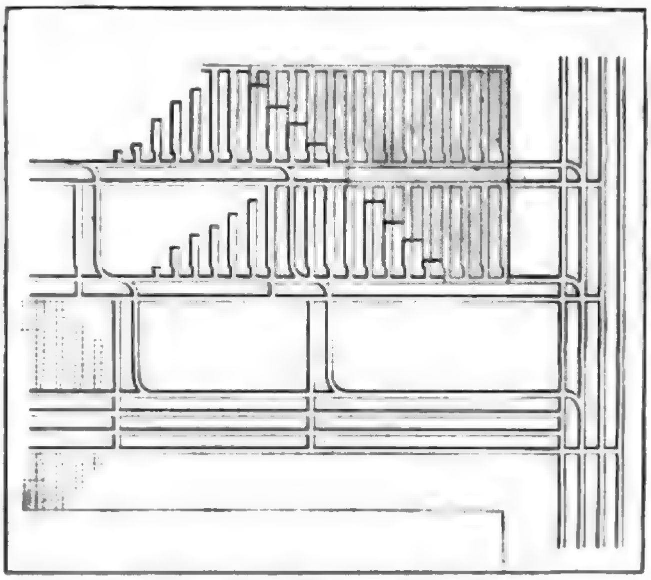
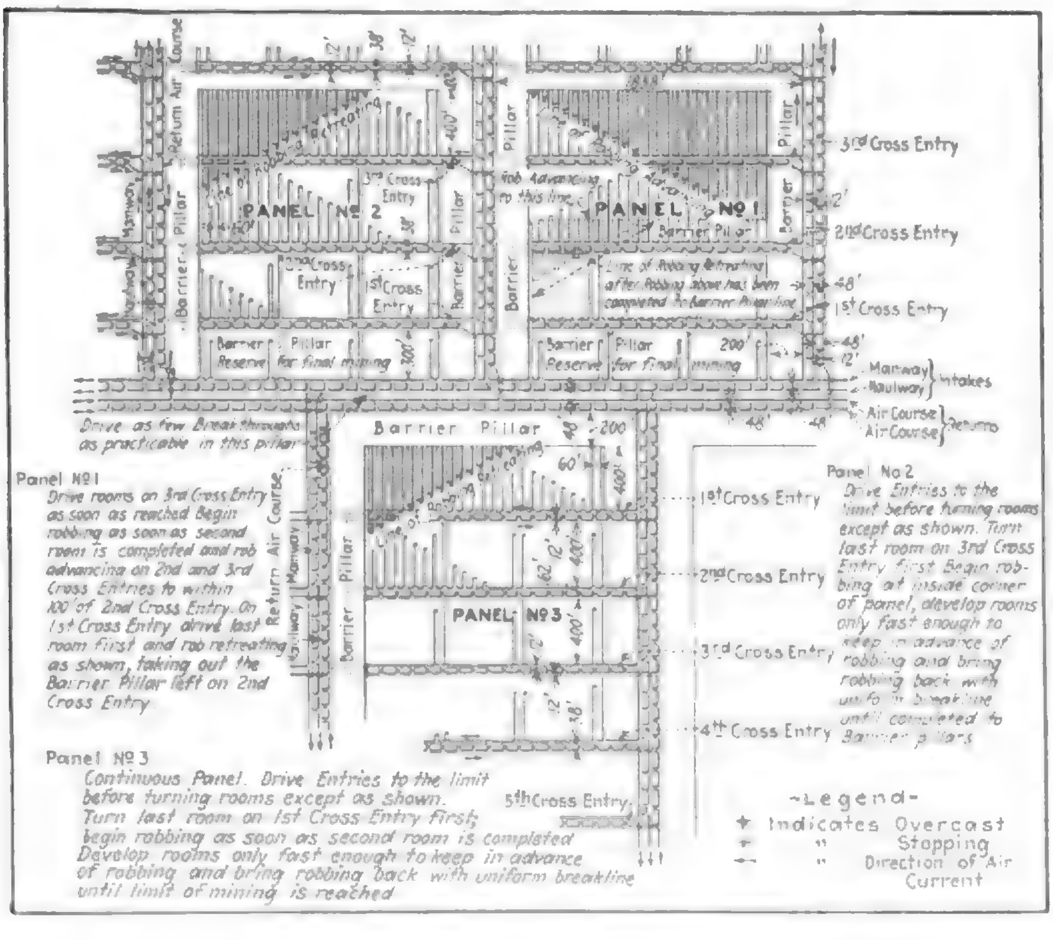


FIG. 10. REVISION OF PANEL 1 IN FIG. 9

By driving the cross roadways, as in this illustration, the headings can be indefinitely extended and a long break-line obtained.

This increase in recovery may be attributed in part to decrease in thickness of coal, in part to improvement in top conditions as the coal becomes thinner, permitting a greater proportion of the coal area to be taken with safety in first mining, as indicated by the decrease in proportion of pillar mining; in part to the fact that but few mines opened since the year 1900 have manufactured coke and in part to the changes in systems of mining illustrated.

Decrease in recovery as shown by the average of mines opened in the last period is on account of the


Return Air Course
Manway
Haulway
Barrier Pillar
Pillar
12'
38'
400'
Line of Robbing Retreating
PANEL No 2
3rd Cross Entry
2nd Cross Entry
1st Cross Entry
Barrier
Barrier Pillar Reserve for final mining
300'
Rob Advancing to this line
PANEL No 1
Barrier Pillar
Line of Robbing Retreating after Robbing above has been completed to Barrier Pillar line
200'
48'
3rd Cross Entry
2nd Cross Entry
1st Cross Entry
Manway
Haulway
Intakes
Air Course
Air Course
Returns
Drive as few Break-throughs as practicable in this pillar
Barrier Pillar
200
60'
Line of Robbing
PANEL No 3
1st Cross Entry
2nd Cross Entry
3rd Cross Entry
4th Cross Entry
5th Cross Entry
-Legend-
✦ Indicates Overcast
" Stopping
" Direction of Air Current

Panel No 1

Drive rooms on 3rd Cross Entry as soon as reached Begin robbing as soon as second room is completed and rob advancing on 2nd and 3rd Cross Entries to within 100' of 2nd Cross Entry. On 1st Cross Entry drive last room first and rob retreating as shown, taking out the Barrier Pillar left on 2nd Cross Entry

Panel No 2

Drive Entries to the limit before turning rooms except as shown. Turn last room on 3rd Cross Entry first. Begin robbing at inside corner of panel, develop rooms only fast enough to keep in advance of robbing and bring robbing back with uniform breakline until completed to Barrier pillars

Panel No 3

Continuous Panel. Drive Entries to the limit before turning rooms except as shown. Turn last room on 1st Cross Entry first; begin robbing as soon as second room is completed Develop rooms only fast enough to keep in advance of robbing and bring robbing back with uniform breakline until limit of mining is reached

FIG. 9

Composite Plan

Shows three methods of operating. Panel 1 shows a method that combines advancing and retreating, the advance being made in the more remote working and the retreat in the near workings. Panel 2 shows a method of retreating from the rear end of the further entry and Panel 3 a method of retreating from the rear end of the near entry. Panel 3 is extended indefinitely, and consequently when the panel is completed an immense area has been extracted and the roof is so completely lowered that a minimum of the roof over the extracted area rests on the roadways on either side of the panel. It is by these methods that the Pocahontas region is making its large percentage extractions.

predominating tonnage from the thick coal mine shown by column 62. The top coal has been left up in most of the entries of this mine and has been included in the thickness, but the greater part of this top coal may yet be recovered.

That recovery increases as thickness decreases is emphasized by comparing results shown in the first eight columns, there being little difference in conditions.

Column 9 represents the only mine completed and shows a recovery of 73.6 per cent. Much of the coal left up in first mining was lost on account of very bad top, and about 30 per cent of the coal produced was made into coke. Column 40 shows a mine with thickness of but 4.5 ft. and, in spite of excellent supervision and great care with the work, shows a low recovery on account of unusually bad top.

Columns 41, 52, 53 and 60 show thick coal and an excellent recovery. Some of the clean coal in the "black rash" top is loaded out in these mines, whereas only the clean coal of the seam is included in the thickness. Columns 42, 43 and 44 have about the same thickness and same proportion of pillar mining but with recoveries of 97 per cent, 91.2 per cent and 85 per cent, respectively, owing to different top conditions.

Columns 50, 55, 62 and 63 show the only mines opened since 1900 in which top coal has been left in first mining. The practice has been discontinued in these mines except as to entries and is being gradually discontinued in all mines.

Columns 56 and 57 do not show any pillar mining. The workings are on No. 3 seam and laid out with wider pillars than usual in order that pillar mining may be deferred until it can follow the pillar mining of the No. 4 seam above.

Fig. 12 shows graphically the average thickness of coal, the average recovery in gross tons per acre-foot and also in percentage, and the average proportion of pillar mining by years from 1890 to 1920 and from the beginning of operations, in 1883, to the end of each year from 1890 to 1920 of all the mines on the property of one of the land-holding companies representing 70 per cent of the total production of the Pocahontas field to the end of 1920, and including mines opened in other fields since 1915. It shows also the total number of mines opened as at the end of each year and the area mined each year.

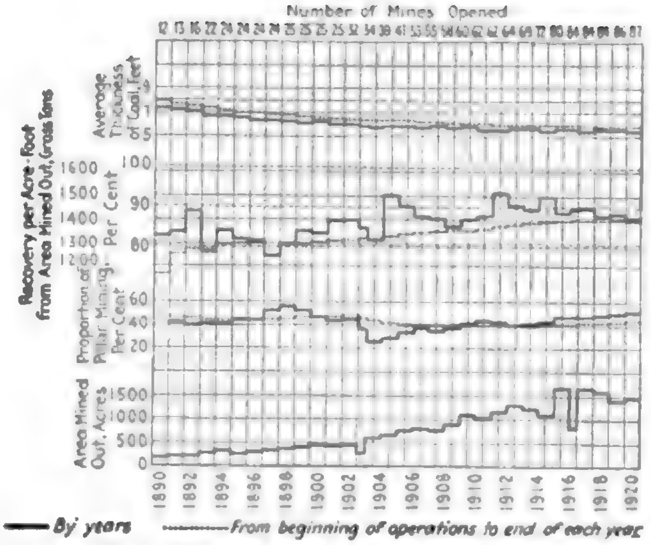


FIG. 12. GRAPH GIVES AVERAGE COAL THICKNESS, PERCENTAGE RECOVERY, PROPORTION OF PILLAR MINING AND ACREAGE EXHAUSTED, BY YEARS

This graph shows how recovery per acre as figured from the beginning of operations till any given year increased steadily till within the last few years. Now, however, it has almost reached a maximum, and advances toward higher extraction are slower and less certain. The thinning of the coal mined has aided somewhat in making the percentage of extraction high.

The averages from the beginning of operations to the end of the years 1890, 1900, 1910 and 1920 are:

Year	Thickness of Coal Feet	Gross Tons Recovered per Foot-acre	Percentage of Recovery	Proportion of Pillar Mining Per Cent	Coal Area Exhausted Acres
1890	7.89	1,161	72.0		899.00
1900	6.74	1,310	81.2	47	4,054.20
1910	6.26	1,358	84.2	44	10,894.95
1920	5.90	1,404	87.0	44	25,431.50

It may be noted that although the recovery by years has many ups and downs, due in part to economic and industrial conditions that obtained in the field from time to time and other causes, the average recovery from the beginning of operations to the end of each year shows a progressive increase. As to the effect of the character of bottom on recovery, there have been occasional instances of pronounced squeezes in which fireclay bottom would heave in openings, causing serious interruptions to haulage, delay in removing pillars and consequent losses. Otherwise the effect of character of bottoms on recovery has been negligible.

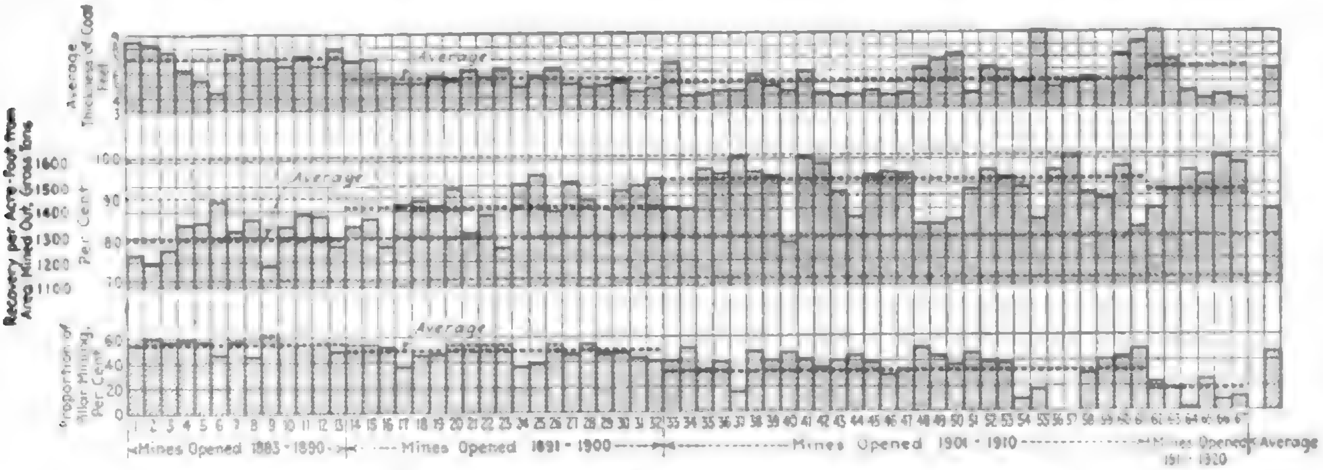


FIG. 11. GRAPH SHOWING AVERAGE THICKNESS OF COAL AVERAGE RECOVERY, AND PROPORTION OF PILLAR MINING FOR SIXTY-SEVEN MINES

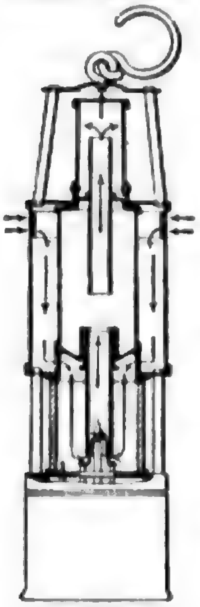
Note how, in the first six mines opened, the reduced thickness in all but one case, No. 2, resulted in increased recovery. Mines 55 and 62 have the thickest coal, and to the pillar losses in the latter mine the lowered percentage recovery in the last decade is ascribed.

German Lamp Which Indicates the Presence Of Methane by Sounding a Warning Note

By Alfred Gradenwitz
Berlin-Friedenau, Germany

THE "singing" safety lamp for miners designed by Dr. Hans Fleissner, professor at the Leoben Mining College, and constructed by Messrs. Friemann & Wolf, of Zwickau, Saxony, is mainly intended to serve as a warning lamp for miners who are already provided with an electric lamp but who cannot with it determine in any way the character of the air in which they are enveloped.

Fleissner lamps may be used also to give warning where gasoline lamps are used, because the signals they give are audible and therefore more likely to be heeded than the small blue cap that can be seen only with difficulty and then only by men having normal color vision.



LAMP THAT SINGS

The tube above the lamp chimney tunefully vibrates when methane is in the air and thus the miner is warned of danger.

The action of the new lamp is based on the principle that a flame burning in the interior of a glass tube under certain conditions will give out a sound audible to the human ear. Though the principle on which the lamp operates is simple and well known, many difficulties had to be overcome in adapting it to actual practice.

The lamp as shown in the illustration is made of metal except for two glass cylinders, which are shown hatched in the cross-section. The flame burns in a narrow glass cylinder or chimney which, by means of a stuffing box, is fitted into a metal vessel. This is surrounded by the usual lamp glass. After entering the upper part of the outer metal cylinder through openings fitted with metal gauze, the air will take the course indicated by arrows between the outer and inner metal cylinders, thus penetrating through a ring likewise fitted with metal gauze into the intermediary space between the outer and inner glass cylinders and, reaching the flame, will burn in the latter cylinder. The products of combustion are discharged through the inner metal cylinder and through the chimney, which is protected by a cap of metal gauze.

The sensitiveness and efficiency of the flame have been increased by fitting it with a coil of wire which in a sense converts the ordinary wick into a bunsen burner. The dimensions of the lamp have been so chosen as to cause it first to sound when the air contains about 2 per cent of methane. As the percentage of the dangerous gas increases, the sound will become louder and shriller, when the flame, which by this time has become nonluminous, will begin to fluctuate. The loudness of the sound will increase when the methane percentage reaches 4, at which time the flame will jump from the burner to the coil of wire. With more than 5 or 6 per cent of methane the flame will go out. However, with the methane at 2 per cent the flame will begin to sing only if the air contains a fair percentage of oxygen. If the atmosphere of the mine has much carbon dioxide and small amounts of oxygen, the explosion limit and accordingly the action of the lamp in the presence of methane will be different.

Actual tests have shown that the lamp affords an absolutely reliable indication of the presence of firedamp and that it can be used safely and satisfactorily under working conditions. Provision also can be made by which it will indicate when oxygen is present in an insufficient percentage.

Tests Range Coal, New Anthracite Size

RANGE coal, the new size which the Lehigh Coal & Navigation Co. has been preparing for the past two months, has been subjected to test by Joseph H. Lucking, a director of the National Coal Association and president of the New Jersey Coal Dealers' Association, says the *Coal Merchant* for April, 1922.

Mr. Lucking used a hand rotary screen in making his tests. The coal that passed through a ¼-in. screen he designated "rice, barley and dust"; that through ½-in. mesh as "buckwheat," and that through the ¾-in. mesh as "pea" coal. The test of the range coal showed that in a ton there is 15 lb. of rice, barley and dust; buckwheat, 135 lb.; pea, 600 lb., and nut, 1,250 lb.

In order to compare this with a ton of nut coal as delivered to the consumer, Mr. Lucking purchased a ton of this size from one of the public pockets in Newark, which he subjected to the same test. This ton of coal showed 20 lb. of rice, barley and dust, 10 lb. of buckwheat, 230 lb. of pea and 1,740 lb. of nut. Another ton from a different public pocket contained 20 lb. of rice, barley and dust, 40 lb. of buckwheat, 260 lb. of pea and 1,680 lb. of nut coal.

The coal of the Lehigh Coal & Navigation Co. was found to contain about one-fourth of the amount of nut in the range size usually found in nut coal, which makes a 50c. reduction in price about right, as Mr. Lucking's calculation showed a theoretical difference of 52c.

The Bureau of Mines has entered into a co-operative agreement with the city of Grafton, W. Va., to make a study of the smoke problem of that city. O. P. Hood, chief mechanical engineer of the Bureau, in announcing the Grafton study, points out that "the problem is just as real as, although on a smaller scale than, was found in larger cities. In fact it is much better to have a constructive program for smoke abatement in the early days of the development of an industrial city than it is to wait until its interests, industrial and residential, become too crystalized or well established to invoke drastic changes." Hood is chairman of a committee on standard smoke ordinances for cities appointed by the American Society of Mechanical Engineers. The other members of the committee are Osborne Monnette, of Chicago; Henry Kreisinger, of the American Society of Mechanical Engineers; P. J. Dougherty, of the American Society of Heating and Ventilating Engineers; Lloyd R. Stowe, of the Stoker Manufacturers Association, and E. L. Millard, of the American Civic Association.

The work of coal sampling and analysis by states is being continued by the U. S. Bureau of Mines. Large numbers of samples have recently been taken at mines in Virginia, West Virginia, western Pennsylvania, Alabama, Tennessee, Oklahoma, Utah, and fewer in Colorado, Illinois and Indiana. Data on the coals of Kentucky have been prepared for publication and will constitute the second report of the series of technical papers containing analyses of coals by states; the first, on Iowa coals, was issued some time ago.

How the Life and Performance of the Lead Storage Battery May Be Extended by Proper Care[*]

Terminals Should Be Greased Where Not Lead-Coated — Acid Spray Must Be Removed — Add Water About Once a Week as Needed — Keep Makeup Water in Lead, Glass, Earthenware or Rubber Vessels

By M. F. Packard
East Pittsburgh, Pa.

IN DETERMINING the performance and life of locomotive storage batteries no factor is more important than care. Unfortunately in mining installations neglect is the rule rather than the exception and many of the criticisms of the storage-battery locomotive and most of its failures may be charged to this cause. A few years ago battery troubles sometimes could be ascribed to fundamental defects in the battery structure, but most manufacturers have done much to rectify these errors in design. At the present time, therefore, a battery has little cause to fail if it is given proper supervision and care. These ministrations need be neither burdensome and expensive nor necessitate special skill. It is the intention in this article to outline briefly the way to safeguard the lead battery and obtain the service of which it is capable. This consists mainly in paying adequate attention to cleanliness, replacement of water, location and correction of troubles and careful charging.

With the lead battery, cleanliness is of greatest importance and neglect of this requisite will cause rapid physical deterioration and possibly destructive accidents. If care is taken in accordance with the following suggestions such troubles can be avoided.

SURFACES SHOULD BE PROTECTED BY PAINT

The interior of the battery compartment, including all exposed metal surfaces other than lead, the wood blocking and the battery trays, must be kept covered with a good acid-resisting paint. The original application will last indefinitely if well applied and cared for. Corrosion of terminals that are not lead coated may be prevented by applications of grease or vaseline. Foreign material and dirt of all kinds must be excluded from the compartment by keeping the covers in place while the locomotive is in operation. Before the covers are removed for the inspection or charging of the battery all precautions should be taken that no material can fall from the roof of the place where the locomotive is standing.

Dilute acid will accumulate on the cell covers and terminal posts from the spray emitted when the batteries are being charged or from creepage if the gaskets become loose. Prompt removal is essential to prevent creepage to the trays and unprotected metal parts, with consequent disintegration and corrosion, which may result in tray destruction, current leakage, grounds, short-circuits or high resistance contacts.

The tops of the cells should be wiped frequently with a damp cloth, and if the compartment is arranged to drain at a point where water will not get on the equipment it will be advantageous to flush it out occasionally with water, after first tightening all filler plugs. Acid on metal or wood parts is difficult to remove completely. It may be neutralized by applying a soda or ammonia solution, care being taken that none enters the cells. Any acid in the tray space left by the removal of a leaky jar should be similarly treated. After such an application all wetted parts should be rinsed with water and dried.

The cells lose water chiefly by gassing, but partly also by evaporation. If the water is not replaced, the electrolyte is concentrated, some of the active plate surface is exposed and the life and capacity of the plates is reduced.

BATTERY NEEDS WATER ONLY ONCE A WEEK

Normally water need not be added to a battery oftener than once a week. This water should be replaced before starting the charge or soon after, so as to insure good mixing and a reliable hydrometer reading at the end. A neat and convenient instrument for doing this is a glass or hard-rubber syringe with a rubber bulb. The cell should not be filled higher than the specified level.

Only pure distilled water should be used unless the ordinary supply has been analyzed and approved by the battery manufacturers. Even small quantities of impurities may seriously harm a battery, and no metal vessel unless it is made of lead is suitable for storing make-up water; glass, earthenware or rubber are the preferable alternative materials.

The specific gravity of the electrolyte furnishes a reliable indication of the condition of battery cells. Its correct value for locomotive batteries is usually from 1.27 to 1.28 at 70 deg. F. In taking hydrometer readings it is necessary to correct for cell temperature by adding or subtracting one in the third decimal place for each three degrees above or below 70.

There can be no appreciable loss of acid from a battery cell except through spilling or leakage. The gravity should never be adjusted by adding electrolyte until after a careful investigation. Falling off in specific gravity, lack of capacity, rapid evaporation of electrolyte and overheating on charge occurring gradually and uniformly throughout the battery signify a dangerous accumulation of sediment that must be removed if injury to the battery is to be prevented.

Local cell trouble is most easily detected when giving the battery an equalizing charge and may be indicated by the low gravity of some particular cell or by its refusal to gas freely after long overcharge. Corrective measures should be applied at once. The elements may be lifted from the jar and the plates inspected. Damaged separators that may have caused short-circuits should be replaced, the new ones being inserted from the bottom and forced all the way up. None should be omitted and all should project equally on each side of the plates. The element with its cover attached should be placed on edge for this operation. Sediment should be removed from the jar if near the top of the ribs and any moss that may have formed on the edges of the plates should be dislodged. Before the sediment is cleaned out the electrolyte should be decanted, to be used again if in good condition. Do not wash the plates.

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[*] This will be followed soon by an article by the same author on the care and maintenance of the nickel-iron battery.

A leaky cell will seem to require abnormal quantities of water and the gravity will fall through dilution. This indication may be confirmed by examining the tray for moisture, and a new jar should be installed as quickly as possible.

Before repairs are made the battery should be given an equalizing charge, upon completion of which the repaired cells may be filled with electrolyte of 1.28 specific gravity. Repaired cells should be charged until the gravity reaches a maximum and remains stationary for three hours. If the gravity is then above or below normal it can be readjusted by drawing off a small quantity of electrolyte and replacing it with pure water or with electrolyte of 1.28 gravity. Mix thoroughly and test by a short gassing charge.

How to Remove Trays, Cells and Covers

In removing trays from the battery compartment the blocking, if any is used, should be removed with care and adjacent tray terminals marked to insure replacement in the same position. Trays should be lifted by the handles, great care being taken not to spill the electrolyte or drop the trays. To remove an element the cell connections at the posts should first be broken. If the joints are burned this should be done with a connector puller, and if they are bolted, by unscrewing the bolt. The cell, including the jar, may now be lifted from the tray by gripping the posts with gas pliers if necessary.

The cover may be detached from the jar by running a hot putty knife through the sealing compound close to the jar wall and removing all the compound adhering to the jar and cover. The element may be withdrawn by holding the jar between the feet and pulling on the two posts as when lifting the complete cell from the tray. The jar may be softened and expanded sufficiently to free the element, should it stick, by submerging the cell in hot water almost to the top of the jar.

In replacing the element one terminal may be held with gas pliers and also gripped near the bottom to prevent the plates from spreading and the outer ones from starting down the outside of the jar. To seal, hot compound may be applied with a hot putty knife, after the cover and exposed portion of the inner jar wall have been wiped with ammonia-moistened waste to neutralize the acid. In making burned connections no soldering flux of any kind should be used. Burned connections can be made easily with a carbon burning set by carefully following the instructions furnished therewith.

Contrary to popular belief, a battery may be discharged safely at any value of current it will deliver. The terminal posts and connecting straps of practically all locomotive-type batteries are now of adequate section for any possible rate of discharge. Of course, the ampere-hour capacity on sustained discharge will decrease as the current increases, but if rest periods are allowed between discharges, practically the rated capacity may be obtained. At the end of complete discharge the specific gravity of the electrolyte in most locomotive-type batteries will be 1.15 to 1.175. The discharge should be stopped and prompt recharge begun when this gravity is reached or when the voltage drops to 1.7 per cell with normal discharge current flowing.

For locomotive service an ampere-hour meter is a reliable guide to the state of the battery charge, provided the accumulator is periodically given equalizing charges to reduce completely the small quantity of active material which is frequently left unchanged after a normal charge, and also to restore the cells which, through individual peculiarities, may have become abnormally low, and to prevent the cumulative effect of slight inaccuracies in the calibration and compensation of the meter.

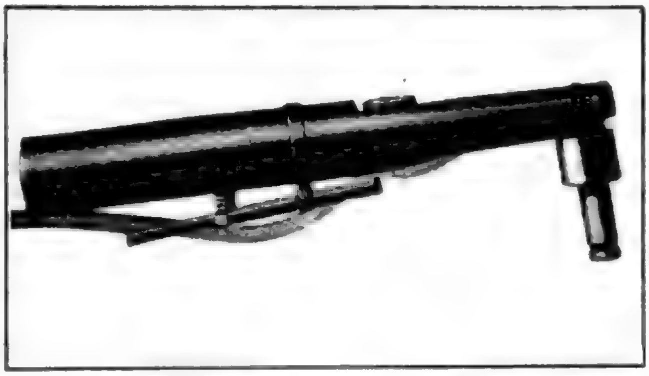
Filler for Batteries That Does Not Slop And Shows Light When Cell Is Full

IN PUTTING makeup water into the cells of a storage battery, care must be taken to prevent this water from running over and spilling upon the tops and sides of the cells. Furthermore, the battery jars should be filled up to a certain height and no more. To accomplish these results with the aid of the ordinary appliances available around the coal mine is by no means easy.

To facilitate the replenishment of a battery with either distilled water or electrolyte and assure that each cell shall contain exactly the right amount, the instrument shown in the accompanying illustration, which is known as a cell filler, has been devised and is now being marketed by the Exide Storage Battery Co., of Philadelphia, Pa.

This device is extremely simple. In operation the barrel is grasped by the operator and the nozzle inserted in the filling vent of the cell. The operator's index finger rests upon the trigger lever on the under side of the barrel or body of the instrument. When this trigger is pulled or depressed, water will flow through the hose into the cell. When the electrolyte rises to the proper height it makes an electrical connection and lights a small bulb on the upper side of the instrument. The trigger is then released and the flow of the liquid stopped. This operation is repeated with each cell requiring replenishment.

By this means time and labor are saved and, what is more important, the cells of the battery are uniformly filled. Overflowing may be avoided and the tops and sides of the cells kept dry.



FILLER THAT FLASHES SIGNAL WHEN CELL IS FULL

Release of pressure on the trigger under the filler shuts off the flow of water from the hose almost instantaneously. The nozzle of the filler is so constructed that a light will be shown when the water in the cell reaches the required level

WINTON WASHERY OF STAPLES & BELL, WHERE A FLOTATION PLANT WILL BE OPERATED

Operating Records and Construction Layouts of Plants Using Chance Flotation Process of Preparing Coal

Coal and Rock Are Separated in a Continuously Agitated Mixture of Sand and Water—Unsized Material Can Thus Be Treated as Fast as Slate Can Be Discharged from the Bottom

By Dever C. Ashmead*
Kingston, Pa.

TAKING advantage of the difference between the specific gravities of coal and the impurities accompanying it, a new flotation process bids fair to modify greatly the methods now employed in the preparation of anthracite and in the design of equipment used for that purpose. It will also change markedly the arrangement and design of preparators. This process was invented by T. M. Chance, of H. M. Chance & Co., of Philadelphia. The basic principle involved is that of producing by mechanical means a liquid the specific gravity of which is intermediate between that of coal and its accompanying impurities. In such a liquid, coal will float, whereas slate and bone will sink. As the specific gravity of coal itself varies somewhat, provision is made in this device for altering the weight per cubic foot of the liquid to suit the quality of the material being treated.

In order to obtain the desired results the machine utilizes a mixture of fine sea sand and water. The maximum specific gravity obtainable with these substances will closely approximate that of the sand itself, while it may vary from this down to unity or the specific gravity of the water used. The value actually employed will depend upon the nature of the coal to be treated and the allowable amount of bone to be shipped with the mine product.

This apparatus permits the complete elimination of all slate from the coal. It consists of a cone-shaped receptacle containing the mixture of sand and water, the sand being kept from settling by the action of an agitator making 14 r.p.m. Water is fed to the machine through the refuse discharge pipe at the bottom of the cone, and makeup sand is pumped from the sand sump to a launder discharging into the cone top.

At the West Nanticoke plant of Staples & Bell, where one of these coal separators is installed, the water flows upward through the cone at the rate of 6 in. per minute, and discharges from the overflow at the top at the same speed. Coal is fed by a chute to the top of the cone. This material is unsized—that is, it is a mixture of all sizes smaller than egg. Egg and larger coal is screened out of the run-of-mine, and after hand picking to remove large lumps of stone, goes to a set of crushing rolls. After being broken down it passes to the separator with the balance of the coal.

DENSITY SUCH THAT GOOD COAL WILL FLOAT

As the specific gravity of the liquid in the separator is maintained intermediate between that of the coal and that of the rock and slate, all the coal and the lighter pieces of bone float, and the rock, slate and heavy bone sink. The coal and light bone go over the overflow along with the surplus water rising through the cone. This product with some sand adhering to it then passes over a screen, where the coal is thoroughly washed with clean water and the sand thus removed. Thence it is fed to a set of shaker screens, from which the various sizes made are sent to their respective pockets. Samples are taken from time to time, of course, to make sure that no excess bone is included.

Within the cone itself slate and heavy bone sink to the bottom and enter the discharge pipe. At the lower end of this pipe a slide gate communicates with a refuse chamber also provided with a gate at its lower extremity. When the upper valve is closed and the one

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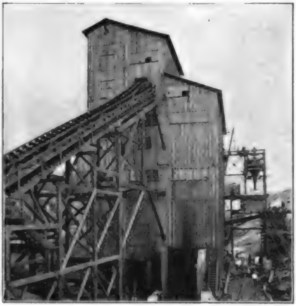
*Anthracite editor, *Coal Age*.



WEST NANTICOKE WASHERY OF STAPLES & BELL
Flotation plant under construction is shown on right, where the agitation cone can be seen in place.

at the bottom is open, it allows the rock to pass to a refuse pocket, from which it is removed by a dragline or scraper conveyor.

As the refuse moves down the discharge pipe from the cone it is partly freed from sand by the action of the water moving upward to the cone through this passage. Some sand passes out through the refuse chamber, however, and when the waste material is discharged from the refuse pocket it goes over a small screen, where this sand is washed off. Thence the slate and rock are sent to the dump.

Sand from the coal and slate screens is conveyed through pipes to the sand sump, being thus returned to circulation. In the sump the sand settles and is by this means separated from the surplus water. It is pumped back to the cone as needed.

BALLS USED TO TEST DENSITY OF FLUID

From time to time tests are made on the specific gravity of the separating medium so as to ascertain whether it is being kept at the proper density. This test consists in placing balls of varying known specific gravities within the cone. If these test balls sink, sand is added to the mixture in the cone until it is brought to the desired weight per cubic foot. If they float more water is added.

At west Nanticoke a 7-ft. 6-in. cone is installed. A 50-hp. motor is connected to this machine, but from 11 to 16 hp. only is normally consumed. This motor drives the agitator, the refuse conveyor and the shaking screen. Another motor drives the sand pump. This is a 25-hp. machine, but it operates at 20 hp. Consequently, in all about 36 hp. is required to drive the entire equipment.

The latest installation of one of these separators is at the Beaver Brook plant of the C. M. Dodson Coal Co. The placing of this equipment, however, was not quite completed before the present suspension of operations throughout the anthracite region began on April 1.

This machine has a diameter of 15 ft., or just twice that of the one at Nanticoke. A number of improvements also are embodied in its construction. Thus the discharge pipe is four times the diameter of the first one, and an interlocking device has been fitted to the upper and lower refuse gates, so that the two cannot be opened at the same time. Otherwise the contents of the cone might be allowed to escape. An accident of this kind is, of course, no fault of the machine, but the interlocking arrangement will tend to guard against human frailties.

Another improvement is the introduction of pipes into the side of the cone, through which water may be forced to start or aid in starting the agitation of the sand should the machine be shut down for any reason. The refuse chamber on this machine is of larger size, so that its contents will not have to be emptied as frequently as was that in the earlier model. A small auxiliary chamber above the upper gate has a capacity of 1½ tons of rock and slate, and the main chamber will hold 4 tons of refuse.

WILL REDUCE HEIGHT OF THE BREAKER

Before taking up the capacities and the results obtained through the use of this process it might be well to refer to the accompanying illustrations showing plans designed for a new type of preparation plant utilizing this kind of separation machine. This illustration shows a building 129 ft. in height. If, however, a conveyor were installed, instead of a tower hoist, as is the usual practice in breakers, to take the coal to the top of the building, the height of the structure would be less than 100 ft.

In this preparation plant the coal will be first dumped into pocket (3). Thence it will be discharged by the feeder (4) onto the lump-and-steamboat shaker (5). From the deck of this shaker the coal will pass to the traveling picking table (7), where large pieces of rock will be removed, the cleaned product going to the crushing rolls (8). Coal going through shaker (5) will pass to a shaking chute (6), thence to a spiral chute, after which it will join the crushed coal from the rolls (8) moving in the chute (9). By this latter chute it will be delivered to the washing cone (10).

The clean coal overflowing from this machine will go to the bank of shakers (11, 12, 13 and 14) to be sized. Broken coal passing off the top of these shakers will go to a set of rolls (18) and be crushed, after which it will be taken by the conveyor (19) and by it delivered to the cone for re-treatment. Sized products from the various other decks of the shakers will pass by means of shaking chutes (15, 16, etc.) to their proper pockets. Rock from the refuse tank below the cone will be removed and discharged to a shaker that will separate all pieces above chestnut size. This will go to the refuse roll (22) and be then returned by the conveyor or tower hoist and passed through the separator for re-treatment.

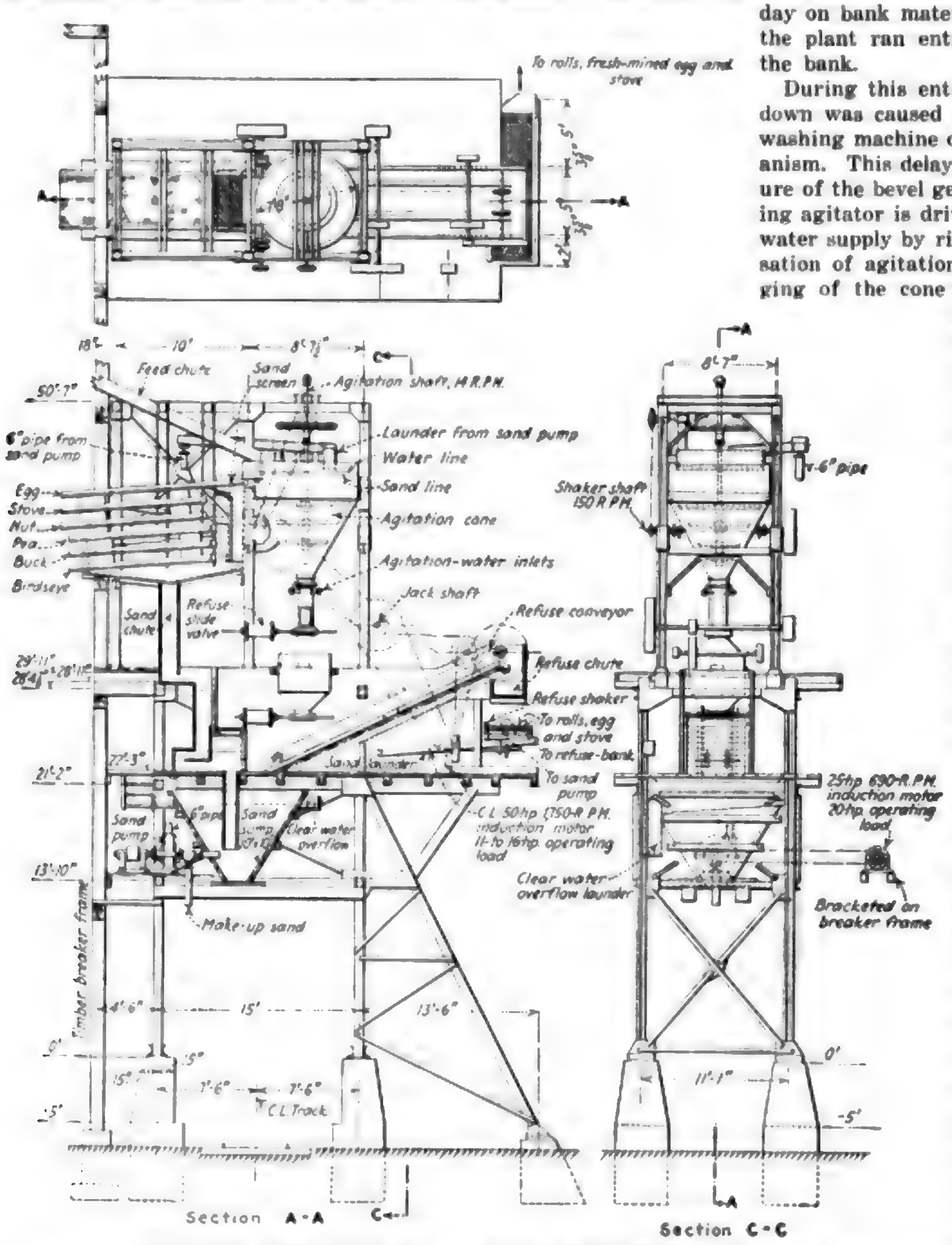
The small refuse will be washed for the removal of sand, after which it will pass to the rock pocket (24). Sand from both shakers (21 and 23) will be taken by sand chutes to the storage pit (26). The makeup sand pump (27) removes this material from the sand storage pit or sump (26), delivering it to the makeup sand cone (28). The sand recovered by washing on shakers (11, 12, 13 and 14) is conveyed by a sand chute (29) to the sand sump (30), from which it is taken by the sand pump (31) and delivered to the cone for use. This sand passes through pipe (33). Overflow from the sand sump (30) passes to a culm settling cone (34).

from the bottom of which the culm is discharged. Water from the cone goes to a sump, from which it is returned by a pump (37) to the water tank (38).

Operation of a double preparator of this description with a capacity of 2,000 tons of coal per day, the feed being 3,333 tons, 40 per cent of which is refuse, will require 41 men. The cubical contents of this structure, as shown, will be 670,000 cu.ft., and the volume per ton of daily capacity will be 335 cu.ft. Preliminary estimates show that a building of this type and size would require 475 tons of structural steel.

The preparation force required in such a building would be as follows: One foreman, 1 bank-and-loader boss, 1 hoist man, 2 dumpmen, 8 platform men, 2 cone operators, 2 cone-refuse dischargers, 1 pumpman, 2 culm men, 2 roll operators, 2 shaker-screen men, 1 oiler, 6 railroad-car loaders, 1 sand man, 2 water men, 3 refuse-larry operators, 2 repairmen, 1 electrician and 1 inspector, making a total of 41 men.

Attention may now be turned to the results actually obtained by this process. The Nanticoke plant was placed in commercial operation in October, 1921, and with the exception of the month of January, has been continuously operated up until April 1. So far as is known, every ton of coal shipped from this plant since last September has been prepared by this process. During a portion of November and throughout practically the whole of December the plant was operating two shifts per day, the day shift working on freshly-mined coal for a part of the time and during the rest of the day on bank material. During the night the plant ran entirely on material from the bank.


To rolls, fresh-mined egg and stove
7'6"
A
Feed chute
Sand screen
Agitation shaft, 14 R.P.M.
Launder from sand pump
Water line
Sand line
Agitation cone
Agitation-water inlets
Jack shaft
Refuse conveyor
Refuse chute
Refuse shaker
To rolls, egg and stove
To refuse-bank
To sand pump
6" pipe from sand pump
Egg
Stove
Nut
Pea
Buck
Birdseye
Sand chute
Refuse slide valve
Sand launder
Sand pump
6" pipe
Sand sump
Clear water overflow
C.L. 50hp 1,750-R.P.M. induction motor 11-to 16hp operating load
Clear water overflow launder
Make-up sand
Timber breaker frame
C.L. Track
18"
10'
8'7½"
50'-7"
29'-11"
28'-11"
27'-3"
21'-2"
13'-10"
4'-6"
15'
13'-6"
0'
5"
7'-6"
7'-6"
-5'
8'7"
6" pipe
Shaker shaft 150 R.P.M.
25hp 690-R.P.M. induction motor 20hp operating load
Bracketed on breaker frame
11'-1"
-5'
Section A-A
Section C-C

PLANS AND ELEVATIONS OF WEST NANTICOKE FLOTATION PLANT

The division of the coal from the slate or bone is done before the coal is sized. When the coal flows over from the cone it is screened into egg, stove, nut, pea, buckwheat and bird's-eye and the fine sand is removed. The refuse falls to the bottom of the cone, is trapped in a chamber having an upper and lower gate and is transported to a chute by a refuse conveyor.

During this entire time only one shutdown was caused by the breaking of the washing machine or any part of its mechanism. This delay was caused by the failure of the bevel gear by which the revolving agitator is driven. A stoppage of the water supply by river débris caused a cessation of agitation, and it was this clogging of the cone to which the accident should be ascribed. As before stated, this machine is 7 ft. 6 in. in diameter and when washing bank material its capacity is limited only by the speed with which the slate can be trapped out through the slate valves. It has been found to treat an average of 25 tons per hour. On two occasions capacity tests have been conducted when operating on culm-bank material. In both cases approximately 62 tons gross of bank coal were passed through the machine per hour. A fully loaded railroad car of coal was delivered by the machine in two hours without overfeeding.

Of course, if the machine is fed at a more rapid rate than that at which the refuse can be withdrawn, slate accumulates in the lower portion of the cone and it becomes necessary to stop the feed until this accumulation can be trapped out. From 5 to 15 minutes is consumed in removing such an accumulation. Were the plant equipped with an automatic feeder, such overfeeding would not occur. After the operatives have become familiar with the capacity of the machine, however, trouble from this cause has been rare, and a feeder such as has been suggested has not been deemed necessary.

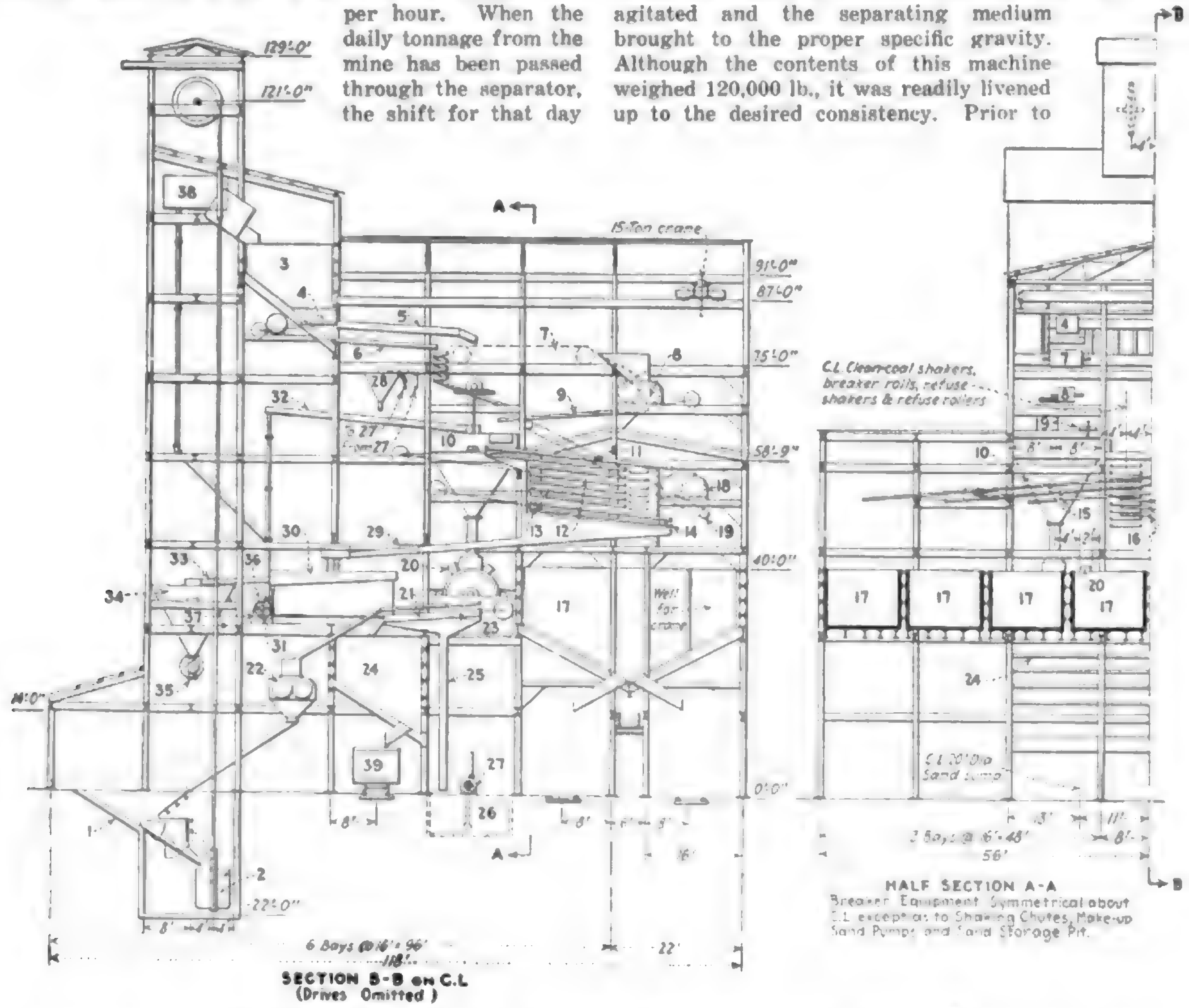
Not alone in this process is it advisable to maintain a steady feed; in all preparators, regardless of their method of operation, steady feeding gives much better results than when coal enters the apparatus in intermittent rushes. No preparation machine can show good results if fed improperly.

The capacity of this machine when working upon freshly mined coal, as shown by its operation through the period above mentioned, appears to be between 50 and 60 tons of feed per hour. The output of the mine furnishing coal to this plant being relatively small, few opportunities have been afforded to determine the maximum capacity of the machine by continuous feeding at high rates over long periods of time.

The mine cars at this colliery hold 1.98 tons each and the usual rate of feed is 30 such cars, or 57.9 tons, per hour. When the daily tonnage from the mine has been passed through the separator, the shift for that day naturally ends. The longest consecutive run for which coal from the mine was available has been 150 cars, or 289½ tons, in five hours. When running on freshly mined coal, the overflow capacity of the machine also is a factor. This, with the type of overflow employed at this plant, seems to be about 50 tons of clean coal per hour.

By the introduction of a scraper, or a coal wheel, the rate of discharge can be materially increased. If such a device were added to the machine, its capacity would be limited only by the amount of slate or refuse that could be removed through the discharge pipe. The overflow type of discharge was employed at this plant because it breaks the coal less than do mechanical devices. With the overflow discharge the coal actually slides out of the machine onto the shakers.

At the Beaver Brook plant, of course, no tests have been made, as this installation has just been completed, its operation being prevented by the suspension of work on April 1. However, on the day prior to the suspension, sand was placed in the cone and was readily agitated and the separating medium brought to the proper specific gravity. Although the contents of this machine weighed 120,000 lb., it was readily livened up to the desired consistency. Prior to


129'-0"
121'-0"
38
3
4
5
6
7
8
28
32
9
27
27
10
11
18
30
29
13 12
14
19
33
36
20
21
17
Well for crane
34
37
23
31
22
24
25
35
14'-0"
39
27
26
1
2
-22'-0"
8'
8'
8'
16'
22'
6 Bays @ 16' = 96'
118'
A
A
15-Ton crane
91'-0"
87'-0"
75'-0"
58'-9"
40'-0"
0'-0"
SECTION B-B on C.L
(Drives Omitted)
C.L. Clean-coal shakers, breaker rolls, refuse shakers & refuse rollers
4
7
8
19
10
15
16
17
17
17
20
17
24
C.L. 20' Dia. Sand sump
3 Bays @ 16' = 48'
56'
8'
11'
B
B
HALF SECTION A-A
Breaker Equipment Symmetrical about C.L. except as to Shaking Chutes, Make-up Sand Pumps and Sand Storage Pit.

TWO ELEVATIONS OF A FLOTATION PLANT FOR TREATING ANTHRACITE

In the illustration 1 is dump bin and measuring chute; 2, 240 cu.-ft. skip; 3, feed bin; 4, feeder; 5, lump and steamboat shaker; 6, shaking chute; 7, traveling platform; 8, rolls to broken; 9, shaking chute; 10, sand-flotation cone; 11, clean-coal shakers making broken and egg; 12, clean-coal shakers making stove, egg and pea; 13, clean-coal shakers making No. 1 and No. 2 buckwheat; 14, clean-coal shakers making Nos. 3 and 4 buckwheat; 15, shaking chutes making egg, stove and nut; 16, shaking chutes making pea and No. 1 and No. 2 buckwheat; 17, pockets; 18, broken-to-egg rolls; 19, egg conveyor; 20, refuse wheel; 21, refuse shaker to stove; 22, refuse rolls to nut; 23, refuse shaker to culm; 24, refuse and platform rock pocket; 25, sand chute to 26; 26, sand storage pit; 27, makeup sand pump; 28, makeup sand cone; 29, sand chute to 30; 30, sand sump; 31, sand pump; 32, sand chute to 10; 33, chute to 34; 34, culm-settling cone; 35, culm discharge; 36, chute and water sump; 37, water pump to 38; 38, water tank; 39, rock larry. The 15-ft. coal separator has a shipment capacity of 2,000 tons per day.

deciding to install one of the machines, Weston Dodson & Co. ran a test on three carloads of coal, with the results shown in Tables I, II and III.

TABLE I—FRESHLY MINED COAL FEED, AVERAGE FOR THREE HOURS, OCT. 23, 1921

Size	Coal, per Cent	Light Bone, per Cent	Chipped Coal, per Cent	Chipped Slate, per Cent	Slate, per Cent	Ash Content, per Cent
Egg	14.8	0.0	0.7	0.5	9.0	....
Stove	22.5	0.0	0.9	0.5	8.1	....
Nut	14.8	0.0	0.0	0.0	4.0	....
Pea	7.5	0.0	0.0	0.0	1.7	....
No. 1 buckwheat	9.4	0.0	0.0	0.0	0.0	29.0
Rice and barley	5.6	0.0	0.0	0.0	0.0	26.4
Total	74.6	0.0	1.6	1.0	22.8	....

TABLE II—COMPOSITION OF WASHED COAL AFTER SIZING, AVERAGE FOR THREE HOURS

Size	Coal, per Cent	Light Bone, per Cent	Chipped Coal, per Cent	Chipped Slate, per Cent	Slate, per Cent	Ash Content, per Cent
Egg	100	0.0	0.0	0.0	0.0	....
Stove	100	0.0	0.0	0.0	0.0	....
Nut	100	0.0	0.0	0.0	0.0	....
Pea	100	0.0	0.0	0.0	0.0	
No. 1 buckwheat	100	0.0	0.0	0.0	0.0	12.2
Rice and barley	100	0.0	0.0	0.0	0.0	14.0

TABLE III—COMPOSITION OF REFUSE FROM SLATE CONVEYOR, AVERAGE FOR THREE HOURS

Size	Coal, per Cent	Light Bone, per Cent	Chipped Coal, per Cent	Chipped Slate, per Cent	Slate, per Cent
Egg	0.0	3.2	3.3	2.2	43.0
Stove	0.0	2.5	2.8	2.6	27.6
Nut	0.2	0.2	0.2	0.1	7.7
Pea	0.0	0.0	0.0	0.0	1.9
No. 1 buckwheat	0.0	0.0	0.0	0.0	1.6
Rice and barley	0.0	0.0	0.0	0.0	0.9
Total	0.2	5.9	6.3	4.9	82.7

Tests, the results of which are set forth in Tables IV to VI, were made on bank material after roughing with jigs in order to remove the heavy rock only.

TABLE IV—COMPOSITION OF BANK FEED, TWO-HOUR RUN MADE ON OCT. 26, 1921, AFTER REMOVING HEAVY ROCK

Size	Coal, per Cent	Chipped Coal, per Cent	Chipped Slate, per Cent	Slate and Bone per Cent
Stove	4.3	0.5	0.5	11.0
Nut	11.0	1.5	1.0	32.0
Pea	7.0	0.0	0.0	14.0
No. 1 buckwheat	5.0	0.0	0.0	10.2
Rice and barley	2.0	0.0	0.0	0.0
Total	29.3	2.0	1.5	67.2

Items are percentages of total sample.

TABLE V—COMPOSITION OF WASHED COAL, TWO-HOUR TEST

Size	Coal, per Cent	Light Bone, per Cent	Bone, per Cent	Slate, per Cent
Stove	86.0	9.0	4.5	0.5
Nut	91.7	5.0	3.0	0.25
Pea	95.0	...	4.0	1.0
No. 1 buckwheat	93.0	...	4.0	3.0

Items are percentages of average samples.

TABLE VI—COMPOSITION OF REJECT MATERIAL FROM SLATE CONVEYOR

Size	Coal, per Cent	Chipped Coal, per Cent	Light Bone, per Cent	Slate and Bone, per Cent
Stove	0.5	1.0	0.0	....
Nut	1.0	0.0	0.0	....
Pea	2.0	0.0	0.0	....
No. 1 buckwheat	0.2	0.0	0.0	....
Rice and barley	0.0	0.0	0.0	....
Total	3.7	1.0	0.0	95.2

Items are percentages of total sample taken from the slate conveyor.

By the use of this process the degradation of the coal is much lessened. In a preparation plant such as the one shown in the accompanying drawing the distance through which the coal must travel before it finally comes to rest in the coal pocket is much shorter than in the ordinary building. Furthermore, in sizing the coal at the head of the building, the small particles act as a cushion for the larger ones.

The complete elimination of jigs also reduces breakage appreciably. In this machine the material is not, as in jigs, caused to alternately rise and fall. Consequently the abrasion of one particle of coal by another is greatly lessened. Furthermore, the delay in sizing the coal till the rock has been removed from it, still further reduces breakage.

This process of preparation requires much water. At West Nanticoke it is possible to draw this from the Susquehanna River. The water in this stream is low in acid and consequently it corrodes but little the lining of the separator. Should these machines be installed in localities where a copious supply of fresh water was not available and mine water had to be used, the effect of acid on the tank and parts of the machine might be serious. However, this difficulty could be met in many ways. Thus the water could be treated with lime and the acid neutralized, or the parts of the machine exposed to the action of the water could be made of bronze, cast iron or some non-corroding metal. The sand, of course, has an abrasive action when agitated, but this is not serious and readily may be overcome.

So far as I have been able to learn, investigations already conducted would indicate that nothing will interfere with an extended utilization of this process. It promises to cheapen the cost of production, decrease the amount of capital invested, reduce the number of men employed, better the product and increase the return because of lessened degradation. It would appear to have like advantages in the cleaning of bituminous coal.

Ultimate Analysis of Coal by Determination From Sodium Peroxide Fusion

IN a paper before the American Chemical Society recently, Prof. S. W. Parr proposed that the ultimate analysis of coal be made by determinations from the sodium peroxide fusion. The percentage of sulphur and carbon from these fusions can be determined by ordinary methods. The hydrogen which contributes to the heat value of the coal is then calculated by subtracting from the total heat that which was derived from the sulphur and carbon. Assuming the nitrogen content to be 1.25 per cent, the remainder of the heat is then assumed to be due to the hydroxyl (OH) radical.

This OH can, of course, be considered as being composed of eight-ninths oxygen and one-ninth hydrogen. Thus the complete analysis for hydrogen, oxygen, sulphur and nitrogen is available. Prof. Parr states that this method has proven satisfactory for engineering use, especially for work where calculation of stack losses is necessary. The results are, he believes, accurate within 5 per cent on any constituent.

Heating Values of Wood

THE heating values of typical samples of wood were reported by Prof. S. W. Parr recently in a paper before the American Chemical Society in Birmingham. Professor Parr finds that drying of the wood samples is the most difficult portion of the analysis. His results show the following heat values in British thermal units per pound of dry wood: Oak, 8,556; pine, 8,836; birch, 8,458.

The percentage of moisture driven off below 105 deg. C. from these woods after they are thoroughly air dried is reported by Professor Parr as follows: Oak, 8.35; pine, 8.88, and birch, 10.18.

THE AVERAGE TRACT of land in Illinois from under which coal is recovered by a single mine is about two miles square —slightly over 2,500 acres.

Problems of Operating Men

Edited by James T. Beard

Oil and Gas Wells in Vicinity of Coal Mines

Illinois Law Relative to Oil and Gas Wells—Distance from Mine Opening — Maps to Be Filed — Plugging Abandoned Holes — Penalties for Violations

UPON reading the inquiry relating to the mining of coal in the vicinity of gas wells, *Coal Age*, Mar. 2, p. 374, I thought that it would be of interest to draw attention to the fact that practically all of the suggestions offered by the editor in reply to the inquiry are contained in the revised mining law of Illinois.

This law went into effect June 7, 1911, supplanting the old law of six years previous relating to the sinking, operating and final filling of oil and gas wells, in mining districts.

Briefly stated, the law prohibits the drilling of oil or gas wells nearer than 250 ft. to any mine opening used as a means of ingress or egress of persons employed in the mine, or used as an air shaft.

Another section makes it the duty of any person or firm in charge, and the owner of the land on which a well is drilled that penetrates a coal seam, to file, within fifteen days, in the office of the County Recorder and in that of the State Mining Board, a statement of facts, giving the location and depth of every such hole drilled.

FILLING AN ABANDONED WELLHOLE

Still another section requires that, previous to the drawing of the casing and abandonment of a hole drilled in gas- or oil-bearing rock, it shall be the duty of said person or firm in charge, and of the owner of the land on which the hole is drilled, to securely stop and plug each hole in the following manner:

The hole to be first solidly filled, from the bottom to a point at least 20 ft. above the gas- or oil-bearing rock, with sand, gravel or pulverized rock, immediately on the top of which shall be seated a wooden plug not less than 2 ft. in length and having a diameter not less than ½ in. smaller than the inside diameter of the well casing.

Then, for at least 25 ft. above that plug, the well is to be filled with the same material just mentioned, and that followed by another plug of the same size and kind as the first. Then, another 25 ft. of the same filling material must be placed above the second plug.

Finally, when the casing is drawn a tapered wooden plug at least 2 ft. in length, or a cast-iron ball having a diameter greater than that of the hole below the seat of the casing, must be seated at that point and the hole then filled to the top with the same material previously mentioned.

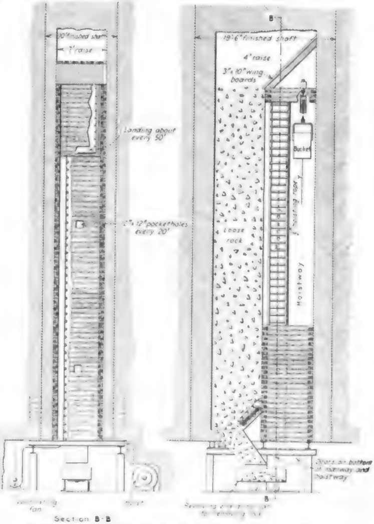
The law further requires the filing of the affidavit of at least two persons who were present when the hole was plugged, said affidavit to be filed with the County Recorder, within fifteen days after the hole was plugged. The law provides a penalty of $100 for every violation of this law and another $100 for every ten days such violation shall continue.

Peru, Ill. **Gaston F. Libiez.**

Driving an Upraise

Sinking shallow shaft in loose material safer than driving upraise—In deep shafts, work expedited by sinking and upraising at the same time—Details of operation in upraising.

HAVING had a long experience in shaft sinking and in working vertical coal seams in different sections of the United States and Canada, I



SECTIONAL ELEVATIONS OF SHAFT DRIVEN AS AN UPRAISE was much interested in the inquiry of a Pennsylvania superintendent asking for the best method of sinking a shaft, which appeared in *Coal Age* Feb. 2, p. 212.

The correspondent appears to be favorably inclined toward driving an upraise, in preference to sinking a shaft from the surface. I quite agree with the statement made, in the reply to this inquiry, that "the sinking of a shallow shaft from the surface will not only be safer but prove more economical and quicker, in the end, than to attempt to drive an upraise from the mine."

In the case mentioned, the proposed shaft is only 70 ft. in depth, and the material is alternate clay and shale formation, which might prove difficult to support safely, in upraising. Again, it is possible to sink a shaft, to this depth, with a derrick, which will avoid the expense of putting up a headframe.

Danger in Driving an Upraise

It cannot be denied that sinking a shaft is always a safer method to employ than upraising. When driving an upraise all loose material must be barred down, following a blast; and it is often hard for the worker to find a safe place to stand, while doing this work. Where experienced men are employed, however, comparatively few accidents happen.

Believing that some of my experiences will be of interest in this connection, I am persuaded to outline briefly the method employed in driving an upraise to meet the sinking operations already started from the surface, in the sinking of a shaft to a depth of 640 feet.

Before proceeding, however, let me say that if the conditions, in the shallow shaft here mentioned, will permit of stowing the excavated material underground, and there is no great amount of water in the strata, driving an upraise would be wholly practicable. In that case, I would use the method I am about to describe.

Method of Driving Upraise to Meet Shaft Sunk from Surface

The main hoisting shaft of the Raleigh-Wyoming Coal Co., at Glen Rogers, W. Va., had been sunk to a depth of 125 ft. The total depth to the coal is 640 ft. In order to expedite the work, a contract has been awarded me by Carl Scholz, vice president and general manager of the company, to drive an upraise, in the mine, to meet the sinking operations going on at the surface.

In the accompanying figures, I have shown the general method of proceeding with this work. The entire excavation below is 7 x 14 ft., in section. As shown in the detailed plan, this is divided into three sections, thereby providing a hoistway, about 3 x 5 ft.; a manway, about 2 x 5 ft., the remaining space being left to hold the excavated material.

The manway and hoistway are shown securely timbered, skin to skin, with 8 x 8 in. hardwood timber. The manway is equipped with steel ladders for the use of the workmen, if necessary. The hoistway is equipped with a bucket and cable, for hoisting material and men, and is protected from falling material by wing-boards, as indicated in the figure.

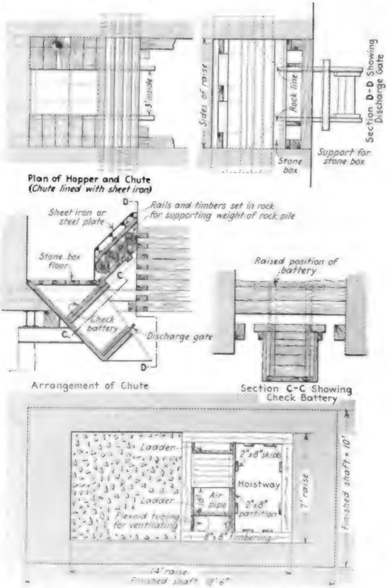
Hoisting and Ventilating

A Waugh portable hoist is installed at the foot of the upraise, and the hoisting rope is carried up the side of the shaft to a headblock, which is suspended from crossbeams, in the center of the hoistway. On the other side of the shaft is a small 12-in. blower to which flexoid tubing is attached. This is extended up the manway to conduct the air to the top of the excavation and provide the needed ventilation.

In the manway, also, is an air pipe for conducting the compressed air for operating the drills, which are the Waugh self-rotating type known as "stopers." As the rock is very hard, 60 per cent dynamite is used for blasting, with first and second delay fuses.

The excavated material is allowed to fill the space in the side of the manway, which is kept full to provide the needed support for the workmen. This material is also drawn from the chutes at the bottom of the upraise, from time to time, as the work proceeds. By keeping the loose rock on a level with the top of the manway good standing room is afforded for the workmen.

At times the loose material will block, however, and need to be started again by means of a bar, or perhaps a small stick of dynamite may be required. For that purpose, there have been left, as shown in the figure, 12 x 12-in. starting holes. These are provided every 30 ft. in the timbers pro-


3' inside
Plan of Hopper and Chute
(Chute lined with sheet iron)
Sides of raise
Rock line
Stone box
Support for stone box
Section D-D Showing Discharge Gate
D
Sheet iron or steel plate
Rails and timbers set in rock for supporting weight of rock pile
Stone box floor
C
Check battery
C
Discharge gate
D
Arrangement of Chute
Raised position of battery
Section C-C Showing Check Battery
Ladder
Ladder
Flexoid tubing for ventilating
Air pipe
2"x8" skids
Hoistway
2"x8" partition
8"x8" timbering
7' raise
Finished shaft = 10'
14' raise
Finished shaft 19'6"

GENERAL PLAN OF SHAFT AND DETAILS OF UPRAISE tecting the manway. If the material blocks it can generally be started by inserting a bar in one of these holes.

Experience in loading chutes, in steeply pitching coal seams, has taught me the need of leaving these holes for starting the material when it has blocked. Where this work had to be done at the bottom of the chute it has often proved a very hazardous undertaking.

J. W. Powell, Supt.
Raleigh-Wyoming Coal Co.
Edwight, W. Va.

Drawbacks in American Mining

Lack of economy not due to foreign mine officials in charge—Interrupted operation and waste create loss in mining—Market conditions prevent steady operation of mines.

DISCUSSING the question of "Economy in Mining Coal," James F. Gamille, in a letter, *Coal Age*, Feb. 23, p. 332, ascribes the lack of economy, in American mining, to the employment of English, Scotch and Welsh miners, who are given charge of the work.

If this is true there certainly must be something wrong with the coal companies who employ these men to take charge of their mines. The fact that they are thus employed, however, is evidence that their methods are not wasteful or uneconomical. The same can be said of our mine inspectors, many of whom are of English, Scotch or Welsh descent.

Again, this writer speaks of these men as having gained their experience in a single locality or district, and regards them as "men of one idea" whom it is difficult to impress with the advantage of a new plan of working. On the contrary, I have found this class of men to be possessed of many ideas, which alone explains their employment to such a large extent in our mines.

All Methods of Mining Found in England, Scotland and Wales

For our friend's information, allow me to say that, in a single day's travel in any one of the countries named, it is possible to find all the various methods of mining known to the coal industry. These different methods are employed according to the varying conditions that exist in the mines.

In England, can be found the room-and-pillar; pillar-and-stall; longwall advancing and retreating; and square work. At times, different systems will be used in the same district, according to the varying conditions that may prevail in that locality. In Wales, there is to be found the longwall method, both advancing and retreating; single and double stalls; and the panel system. The same can be said of the mines in Scotland.

Now, if I was going to adopt a new method of working my first step would be to employ a man who had had experience in that kind of work, without regard to his nationality. Having found such a man, I would give him charge of the work underground and leave him to map out his own plans, in accordance with his experience.

Expressing a preference for the longwall-advancing system of mining, our friend states that he has advocated its adoption for several years, but was never given the opportunity to put it in practice. Is that not because he failed to get his ideas across to the other fellow?

Coal companies are looking for men who can produce the goods; or, in other words, mine coal at a lower cost and with less waste in the mining. In respect to economy here and in the old country, my opinion is that where 65 per cent of extraction is realized in most of our mines here, the majority of the mines in the United Kingdom will show 90 per cent or more of extraction.

Allow me to suggest one or two reasons why there is lack of economy in American mining. One great reason is the failure to operate the mines continuously throughout the year. Mines that are run two-thirds of the time carry the same overhead charges as though they were operated full time. Longwall work, in particular, requires continuous operation of the mine to make the work successful. When working longwall, the coal face must be advanced regularly, in order to avoid an undue pressure on the coal.

Another reason for poor economy is the large waste of coal in mining. This coal is lost beyond recovery, by reason of poor mine management or on account of employing a wrong method of extraction. Too often, the pillars left for the support of the roof, in the first working, are too small and cannot be drawn back safely or economically.

As a rule, much saving can be effected by proper timbering. In my opinion, it would be cheaper in the end to build concrete arches or sidewalls, with steel I-beams to support the roof, on all main haulage roads. The first cost of this work would be offset by the reduction in upkeep of the road, and avoiding delays and wrecks caused by roof falls on these entries.

Finally, while there are many ways in which we may economize in the mining of coal, probably the one that would count for the most is maintaining a steady market for the output of the mine. A steady market would insure continuous operation and reduce the cost of production more than is now realized.

George Bowker.
West Frankfort, Ill.

Inquiries Of General Interest

Gas Given Off by Electric Storage Battery

Principle of Electrolysis of Water—Gases Produced by Dissociation of Water Absorbed by Electrodes—In the Last Stage of Charge Some Gas Given Off

AT A recent meeting of our Mining Extension Class, a question came up regarding the gas given off by the storage battery of an Edison mine cap lamp. There was considerable doubt expressed in regard to whether the battery gave off any gas, after it was completely assembled and in use in the mine.

It was stated, as is well known, that hydrogen gas is given off by a storage battery at the time of charging the battery; but it was generally thought that when a battery has been completely charged and is in use there is no longer any danger to be expected from that source, as the production of gases would cease with the charging of the battery.

We shall very much appreciate having this matter fully explained in *Coal Age*.

Student.
———, W. Va.

Desiring to obtain first-hand information on this point, the question was submitted to the Edison Storage Battery Co., Orange, N. J., and the following reply was received from R. C. Mitchell, sales engineer for the company:

In any electrolytic couple wherein two electrodes and an electrolyte are used, gases are given freely off during the period of passing current. An illustration of this would be the familiar electrolysis of water, as conducted in the laboratories of various Preparatory Schools, in the first year of physics.

In the electrolysis of water, both hydrogen and oxygen are given off. In the case of blank electrodes, these gases are given off in the proportions indicated by the formula for water (H_2O); and the amount is proportional to size of electrodes and current rate.

In a secondary or storage battery of any type or kind, the principle of the electrolysis of water is made use of to obtain a chemical reaction, which on reversal will again react in the opposite direction and produce an electric current. In any storage cell, therefore, as the charge progresses the hydrogen goes to the negative plate and reduces it to a metallic state, while the oxygen goes to the positive and oxidizes it.

At the first part of charge, nearly all the gas is taken up in the reaction; but, toward the end of charge, the gas though still produced at a constant rate (if a constant current rate has been used), will not enter into perfect combination with the materials because of their advanced state in the chemical reaction. The gases will then have to come off the cell. It is seen, therefore, that toward the end or the completion of charge, gas will come off in an increasing proportion depending on the state of charge.

In the small size of cells used in the Edison mine cap lamp a very minute quantity of gas is given off toward the end of charge. This will run about 65 per cent hydrogen and about 35 per cent oxygen; but the total quantity and rate of production will be exceedingly small, being in the neighborhood of 70 per cent of the theoretical amount of 140 c.c., per watt-hour, at the so-called fully charged point; or, in other words, for the last two hours of an 8-hr. charge. This latter is due to the fact that, at the so-called fully charged point, some of the gas enters into the reaction; and, therefore, the volume escaping from the cell does not equal the amount for dissociation of water.

Examination Questions Answered

Examination, Foreman and Assistant Foreman, Sixteenth Anthracite District

(Hazleton, Pa., April 11-14, 1922)

QUESTION—*What is carburated hydrogen? What is its symbol and its weight as compared to air of the same temperature and pressure?*

ANSWER—Carburated hydrogen is another name for methane or marsh gas. Its symbol is CH_4. The weight of this gas is 0.559 times the weight of the same volume of air, at the same temperature and pressure, that being the specific gravity of the gas referring to air.

QUESTION—*What is firedamp? What is blackdamp and give its symbol? What causes this gas?*

ANSWER—Firedamp, as its name implies, is any inflammable or explosive mixture of gas and air, the mixture being chiefly methane and air.

Blackdamp is a variable mixture of carbon dioxide and air, the oxygen content being depleted by reason of the presence of this gas. Blackdamp being a variable mixture has no chemical symbol. Blackdamp is produced wherever carbon dioxide is generated in quantity and allowed to accumulate in poorly ventilated places and in dip workings in the mine.

QUESTION—*What is the most practicable manner of detecting firedamp in the mine?*

ANSWER—Firedamp is best detected in mine workings by observing its effect on the flame of a safety lamp. The presence of firedamp in the air surrounding the lamp is indicated by a faintly visible non-luminous flame cap in the lamp, which is best observed by lowering the wick flame to a mere glimmer and screening the eye of the observer from the glare of the flame. As the percentage of gas in the firedamp increases, the cap increases in height and eventually the lamp chimney fills with flame. In other words, the lamp "flames." As the mixture reaches the maximum explosive point, slight explosions are liable to occur within the lamp.

QUESTION—*What is a blownout or windy shot?*

ANSWER—A blownout shot is a shot that has blown its tamping from the hole, without breaking down the coal. The force of the explosion is then expended on the air, producing a heavy concussion there of air. In the presence of accumulated dust, this is blown into the air and ignited by the flame of the shot, causing a more or less local explosion of dust.

A windy shot is one where the force of the explosion is partly expended on the air, owing to an overcharge of powder or to crevices existing in the coal, through which the gases find vent. A windy shot is not necessarily a blownout.

QUESTION—*What should be considered in fixing the quantity of air for any particular mine?*

ANSWER—In the first place, the quantity of air in circulation in a mine must be sufficient to comply with the requirements of the state mining law, the quantity being generally specified in cubic feet per minute, per man, and an additional amount for each animal employed in the mine. It frequently happens, however, that this method of determining the required circulation does not afford good ventilation at the working faces. A larger volume of air will often be required, in the mining of thick coal, in order to insure a sufficient velocity to sweep away the gases that accumulate. At other times, in the mining of thin coal, the volume of air required by law would cause too high a velocity at the working face and make the men uncomfortable.

Again, in a large mine generating gas or blackdamp in quantity, the circulation required by law will not be sufficient to dilute and render harmless these gases which contaminate the air. For these reasons, in determining the circulation required in a mine, it is necessary to consider both the velocity of the air sweeping the working faces and its quality in addition to the volume require by law.

QUESTION—*What is the smallest amount of air per minute allowed for each person working in a mine? What is the greatest velocity allowed in a gaseous mine, except in the main inlet or outlet airway?*

ANSWER—The anthracite mine law of Pennsylvania (Art. 10, Sec. 3) requires the circulation of at least 200 cu.ft. of air per minute, for each person employed in the mine; and (Sec. 7) the area of all air passages must be sufficient to allow this volume of air to pass while the velocity of the air current must not exceed 450 ft. per min.

QUESTION—*How is the amount of air determined in any airway?*

ANSWER—Choosing a straight piece of airway of uniform cross-section, its area is first carefully measured. The velocity of the air current is then ascertained from the reading of an anemometer, which is exposed for one or more minutes in different portions of the measured area. The reading of the anemometer gives the velocity of the air current in feet, which must be reduced to feet per minute, by dividing by the number of minutes the instrument is exposed to the current. Finally, the sectional area of the airway, in square feet, multiplied by the velocity of the air, per minute, gives the volume of air passing, in cubic feet per minute.

QUESTION—*When the velocity of a current of air is 300 ft. per min., what quantity of air is passing through a 7 × 7 ft. airway?*

ANSWER—The sectional area of this airway is $7 \times 7 = 49$ sq.ft. For an average velocity of 300 ft. per min., the volume of air passing in this airway is $300 \times 49 = 14{,}700$ cu.ft. per min.

QUESTION—*What are the advantages and disadvantages in using electricity for power or other purposes, in mines?*

ANSWER—When a mine is electrically equipped the same power can be used to operate the machines for drilling and cutting the coal, transporting it under ground, lighting the mine and driving electric motors for ventilating and pumping. An electrical installation furnishes a more flexible system of transmitting power underground, than either compressed air or steam.

Electricity cannot be employed with safety in a mine generating dangerous quantities of gas, because of the liability of the gas being ignited by the sparking of wires, blowing out of fuses or short-circuiting of the current, at some point. The presence of high tension wires, in a mine, is always a menace to safety, owing to accidental contact of workmen with the wire.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

INCREASED production, more stable prices, and larger export trade are the principal features shown by figures received during the last ten days of April by the Department of Commerce for its "Survey of Current Business."

"From the figures available in recent months," the report states, "it is clear that fundamental conditions are much better and there is every reason to expect business to improve steadily, although perhaps slowly.

"Imports of unmanufactured wool in March showed a large increase over recent months: The total, amounting to 43,071,000 lb., is by far the largest since April, 1921, i.e., during the period of the emergency tariff. Receipts of wool at Boston were also larger than in February, due to the increase in foreign wool. Receipts of domestic wool, amounting to 10,899,000 lb., were less than in February but were exceptionally heavy for this time of the year.

"The percentage of active wool machinery hours increased in March for carpet and rug looms, cards and woolen spindles. Other groups of machines decreased slightly in activity but, with the exception of combs and worsted spindles, all showed a large gain over March of last year.

"In agreement with other phases of the iron and steel industry, there was a distinct improvement in the March export trade. Total exports increased 55 per cent over February and were the largest since March last year. Imports also increased 2,000 tons, with a total of 14,000 tons, the largest amount imported in one month since January, 1921.

"With a total of 80,853,000 lb., copper exports showed a marked gain over recent months and registered the largest total for any month in nearly two years.

"The trade reports indicating increased operation of the automobile factories is confirmed in the total figures now made available. The March production totals, 152,920 passenger cars, compared with 109,121 in February. The March output is not quite as large as that reported for last July and August, but exceeds the output of any intervening month. Truck production totaled 19,422, or nearly 5,000 more than the February output. The March production is by far the largest in any of the nine months for which figures are available.

"The petroleum industry set new high records in March in all directions. The production of crude totaled 46,916,000 barrels, compared with the previous record output last January of 43,141,000 barrels.

"A marked increase occurred in the production of newsprint paper. The March total was 117,507 tons, the largest since January, 1921. Shipments were slightly less than production, with a consequent small increase in stocks.

The production and shipments of lumber, brick, cement and other building materials increased in March in response to the greater volume of construction. The marked increase in the movement of enamel sanitary ware is indicative of the increase in building.

"Exports of wheat, including flour, increased over February, with a total of 14,371,000 bushels. Since the beginning of the crop year we have exported the equivalent of 236,672,000 bushels of wheat.

"Wholesale price-index numbers indicate a slight rise over the condition in February. On the whole, prices seem to be stabilized for the present at an average of about 50 per cent above the pre-war level. Retail prices, on the other hand, continue to decline. The index of the cost of living, compiled by the National Industrial Conference Board, showed a drop of three points in the total during March."

Federal Reserve Report Favorable

In analyzing the business situation as of May 1, the Federal Reserve Board says that reports received by the U. S. Employment Service for the period ending March 31 showed an increase of 2.5 per cent in numbers employed as compared with the preceding month.

District No. 1 (Boston) reports that notwithstanding the continuance of the textile strike, the "actual amount of unemployment in the cotton manufacturing industry is probably no larger than at the beginning of April." In the centers of manufacture for metal goods, machinery and tools such as Waterbury, Worcester, Providence and New Haven, there has been a steady upward movement in numbers employed.

In New York State there was an increase of 1.3 per cent in numbers employed in industrial establishments between Feb. 15 and March 15, according to the reports received from the New York State Department of Labor. In District No. 3 (Philadelphia), excluding 200,000 striking miners, employment conditions also showed continued improvement between March 15 and April 15.

The special inquiry regularly made into employment conditions in District No. 7 (Chicago) shows that 220 firms employing 117,983 persons at the end of March had on their payrolls 3.5 per cent more employees than at the end of the preceding month, and practically the same number as a year ago, the decrease amounting to only 0.1 per cent.

Idle Cars Up 70,967 in Week

Idle cars for the week ended April 15 totaled 491,513, an increase of 70,967 compared with the 420,546 idle cars reported on April 8. Of these 333,393 were surplus freight cars. Surplus coal cars totaled 187,918, an increase in a week of 65,559, while an increase of 613 was reported for coke cars, the total surplus being 2,842.

Brass Company Raises Wages

Notices have been posted in the shop of the Ansonia Manufacturing Co., Ansonia, Conn., announcing a 15 per cent wage increase, to go into effect May 15. The company manufactures brass goods. Between 500 and 600 employees are affected. The company cut wages about a year ago, promising at the time to raise them as soon as conditions justified.

400 Steel Men Get Work

The Bethlehem Steel Co. has started another finishing mill at its plant at Lebanon, Pa., giving employment to 400 men.

More Mine Fatalities in March, but Ratio To Output Is Lower Than Last Year

ACCIDENTS at coal mines in March, 1922, caused the deaths of 187 men as compared with 137 during the same month last year, an increase of 36 per cent, according to reports received by the Bureau of Mines from all state mine inspectors. The fatality rate, based upon an estimated production of 58,950.000 tons, was 3.17 per million tons mined, as against 3.62 for March last year, when the output was 37,798,000 tons.

During the past nine years (1913-1921) the month of March has averaged 201 fatalities, with an average production of 48,039,000 tons, indicating a fatality rate of 4.18 per million tons mined. It will thus be seen that the rate for March, 1922, represents an improvement of nearly 25 per cent.

On March 24 an explosion of gas and dust, supposedly caused by an electric arc, resulted in the death of 17 men at the Sopris mine, Sopris, Col. In this connection attention should be called to the increase in the number of explosions in the first quarter of the present year. There have thus far been five major disasters with a loss of 66 lives, as compared with five similar disasters and a loss of 34 lives during the whole of 1921. Unless greater care is exercised by all persons concerned, the record at the close of 1922 will not be an enviable one as regards large disasters.

During the first quarter of the current year 566 men have been killed at coal mines, as compared with 494 during the corresponding quarter last year, an increase of 72 fatalities, or more than 14 per cent. The output of coal for the same periods was 150,923,000 tons and 124,030,000 tons, respectively, an increase in 1922 of about 22 per cent. The increased production has resulted in a decline in the fatality rate per million tons mined from 3.98 in 1921 to 3.75 in 1922.

If the causes of the fatalities during the three months, January to March, be considered in relation to production of coal, the reports show a decrease in the per-million-tons fatality rates for nearly all of the main causes of accidents. A conspicuous exception to this statement is in explosions of gas and dust, for which the fatality rate per million tons has increased 173 per cent over the first three months a year ago and 156 per cent over the rate for the entire year 1921. These increases occurred in explosions caused by shots and those caused by electric arc.

When the general strike now in progress is terminated and coal-mining operations are resumed, special caution should be exercised by miners and operators to avoid an increase in accidents due to lessened morale and an interruption to normal safety measures and training.

Freight Car Loadings Fall 7,555; Coal Movement 6,595 Cars Less

LOADINGS of revenue freight totaled 706,713 cars during the week ended April 15, compared with 714,268 during the previous week, or a decrease of 7,555. This was, however, an increase of 4,597 over the corresponding week in 1921 and 105,018 in excess of the corresponding week in 1920, when, however, the unauthorized strike of switchmen seriously affected transportation.

Coal loadings totaled 62,851 cars during the week of April 15. This was 6,595 less than the total for the preceding week, 71,195 less than for the corresponding week last year and 73,035 under the corresponding week two years ago. Tabulations showed 8,072 cars loaded with coke, a decrease of 527 compared with the preceding week but 3,686 in excess of the same week last year and 1,291 above the same week in 1920.

THE SENATE COMMITTEE ON JUDICIARY has appointed a subcommittee consisting of Senators Cummins, of Iowa; Nelson, of Minnesota, and Walsh, of Montana, to give hearings and report on the bill of Senator Edge, of New Jersey, defining the status of trade associations and placing them under jurisdiction of the Federal Trade Commission.

COAL-MINE FATALITIES DURING MARCH, 1922, BY CAUSES AND STATES

(Compiled by Bureau of Mines and Published by *Coal Age*)

State	Underground													Shaft					Surface							Total by States	
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal.	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions (including gas and dust combined).	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1922	1921
Alabama	5		2										7													7	9
Alaska																										0	0
Arkansas																										0	0
Colorado	3	2			17								22							1					1	23	4
Illinois	5		4		1			1					11										1		1	12	12
Indiana	2		2										4													4	2
Iowa	1		1										2	1				1								3	[illegible]
Kansas	1												1													1	2
Kentucky	2		3					1					6										1		1	7	9
Maryland																										0	0
Michigan																										0	0
Missouri																										0	[illegible]
Montana	1												1													1	3
New Mexico	1							1					2													2	2
North Dakota																										0	1
Ohio	[illegible]	1											10													10	11
Oklahoma	1												1													1	0
Pennsylvania (bituminous)	9	4	5	5						2			25			1		1								26	11
South Dakota																										0	0
Tennessee	1		1										2													2	0
Texas																										0	0
Utah	1	1				1							3													3	1
Virginia	1		1										2													2	3
Washington			1										1											1	1	2	0
West Virginia	14	5	7			2		3		1			29						1				2		3	32	17
Wyoming						1						1	2													2	1
Total (bituminous)	54	10	27	5	14	4		5		3		1	131	1		1		2	1	1			2	3	7	140	88
Pennsylvania (anthracite)	16	5	8	5	1	6						1	41	1				1			3		1	1	5	47	49
Total, March, 1922	70	15	35	10	15	10		5		3		2	172	2		1		3	1	1	3		3	4	12	187	
Total, March, 1921	[illegible]	6	25	8		12	2	7	2	1		3	122	2		1		3	2	1	3		1	5	12		137

Says Ordinary Buyer's Coal Bill Chiefly Represents Transportation Charges

J. D. A. MORROW, vice-president of the National Coal Association, told the members of the Academy of Political Science, in New York City, on April 27, that since bituminous coal prices are determined by competition in the open market the individual operator, or a group of operators, is no more able to arrange in advance a schedule of prices month by month throughout the year than a grower of hogs in Indiana can determine in advance the price at which he will sell his hogs in different months.

Following out the same argument Mr. Morrow said it has been found possible for distributors of anthracite to put arrangements of this character into effect, but they are dealing with a commodity which can be stored readily and of which the production is limited, so that methods of marketing the output can be applied there which are wholly impracticable in the case of bituminous coal.

Transportation charges figured largely in the addresses and discussions of the meeting, which had been called to discuss railroads and business prosperity. Mr. Morrow's subject was "The Transportation Factor in the Price of Coal." He told his hearers that when the ordinary consumer pays his coal bill he thinks he has paid for his coal when as a matter of fact what he has chiefly bought and paid for is transportation service from the coal seam to his furnace room.

The proposal that coal producers store a part of their output at the mines in summer and thus render the operation of their properties more stable and regular has the defect of being impractical, Mr. Morrow said, since production, transportation and distribution of coal is effected at the most economical cost when that movement is uninterrupted. There also is a certain degradation and deterioration of coal in storage, so that it would have to be sold by the producer who has stored it at a higher price than his freshly mined coal, if he is to avoid a loss.

W. N. Doak, vice-president of the Brotherhood of Railway Trainmen, who spoke on labor policies from the viewpoint of the railway employees, suggested as a proper solution of railroad labor disputes the re-establishment of the Board of Mediation and Conciliation, with the right to bring about, if possible, voluntary arbitration; establishment of bi-partisan boards of adjustment on which the railroads and the employees are equally represented; re-establishment of the rights of the respective parties to adjust any disputes by mediation, conciliation or voluntary arbitration if possible, before reference to any board; maintenance, if necessary, of a board to act as referee, which for the time being, until otherwise changed, would be the U. S. Railroad Labor Board, this board to be applied to only in case of deadlock by bi-partisan boards or in case of failure to adjust any dispute through mediation, conciliation or arbitration; establishment of a system or plan by which exact facts concerning wages, grievances and conditions of employment may be accurately obtained in a fair and impartial manner; prohibition by law or otherwise of the circulation of propaganda concerning railroad disputes, which has a tendency to alarm or inflame the public mind.

Henry C. Wallace, Secretary of Agriculture, said that either freight rates on agricultural products and on the principal commodities the farmers need to buy must come down quickly to about pre-war levels, or prices on agricultural products must increase sufficiently to equal the increasing freight rates, or there will be profound readjustments in agricultural production and these will involve readjustments in industry as well.

Daniel Willard, president of the Baltimore & Ohio Railroad Co., said that whatever policy of ownership, control or operation may be adopted with reference to American railroads it must make satisfactory provision so that in times of emergency it will be possible to mobilize and coordinate promptly all of the physical properties of all companies in order that the railroads as a whole may be used in the most effective manner possible.

Walker D. Hines, former Director General of Railroads: Charles R. Hook, vice-president and general manager, American Rolling Mill Co., of Middletown, Ohio; William J. Cunningham, of Harvard University, and R. H. Aishton, president of the American Railway Association, were other speakers.

British Engineering Situation Parallels Labor Conditions in Coal Industry

THERE is a distinct parallel between the developments which have culminated in the engineering trade stoppage and the situation recently created in Great Britain by the controversy over Part II of the Mining Industry Act. The conditions prevailing in the two great industries are, of course, entirely different, and the respective sets of circumstances which brought matters to a head are in no sense analogous, but the basic principle involved is the same in both cases: Whether or not the employers are to retain their legitimate right to exercise the functions of organization and management free from the continual interference of those men who claim to speak for the workers.

The defunct Part II of the Mining Industry Act was an innocuously worded measure, but its potential dangers were apparent to every owner and manager of experience. If skilfully employed, it would have proved a veritable charter of liberty to the extremists and political opportunists of the miners' unions.

The conditions that would emerge if the small minority constituting the dissenting balloted members of the Amalgamated Engineers' Union had their way represent a big advance on the abandoned proposals of Part II, and are such that, if applied to the mines, would render colliery operations dangerous in the extreme, or, indeed, impossible, as no manager would dare undertake the responsibilities for safety for which he is liable under the various acts of Parliament.

Effective control cannot be shared by colliery managements with any other party or parties if mining properties are to be safely and efficiently worked. This is equally true of the engineering trades, where a system which virtually amounts to dual control, imposed upon the employers by the shop stewards and works committees, has made it impossible for the former to keep their establishments open.

Under no economic system is it practicable for the responsible organizers and managers of a business concern to carry on when their instructions on essential matters are constantly challenged and frequently ignored or reversed by their workmen's representatives. Such vexatious interference is bound to upset costing and the other factors which necessarily enter into every contract, and is calculated to transform what would have been a profitable transaction into a losing venture.

There, too, is the question of the engineering employers sanctioning a state of affairs by which a precedent of the most dangerous kind would be established, one that might eventually involve every other great industry of the nation. The usurpation of the employer's legitimate and necessary rights by trade unions, acting under the pressure of extremists, is a development along lines which economic laws do not recognize. It is the thin edge of the wedge of industrial anarchy.

IN COAL AGE of April 27, on page 704, there was published a statement from the Pennsylvania State Employment Bureau respecting the number of coal miners on strike in that state. It is obvious that these figures cannot be correct, for it is stated that 194,698 bituminous coal miners are out, whereas there are only about 175,000 bituminous coal mine workers in that state. The statement also says that the number of anthracite mine workers idle in that state is 95,000. There are approximately 145,000 men in the anthracite industry and they are all on strike.

DISCUSSING THE COST OF LIVING, Secretary of Agriculture Wallace says that of the average family budget 5.6 per cent is expended for fuel and light and that fuel and light advanced 77 per cent from July, 1914, to March, 1922.

More Illinois Mines Install Improvements During the Strike

IT IS evident that a good many Midwestern mining companies are looking into the future with confidence and are preparing now for next year's business. The O'Gara Coal Co., is spending more than $50,000 on a new office building in Harrisburg, Ill., and a new concrete building over its remodeled preparation plant at No. 1 mine. The Harrisburg building will be two stories high and of mill construction to house various of the operating departments of the company. In the expanded preparation plant at the mine will be installed new shaker screens and loaders and one additional loading track under the tipple.

The J. K. Dering Coal Co., of Chicago, is spending approximately $50,000 to extend its power system at its No. 6 mine so as to bring the plant to a point of development at which there will be no production delays chargeable to insufficient power. The Bell & Zoller Coal Co., also of Chicago, is installing a 300-kw. generator set deep in the workings of the Zeigler No. 1 mine, at Zeigler, Ill. This is but one of the units in the mine that serve to maintain voltage at the working faces in spite of their distance from the power plant.

Coal Consumed by Railroads in February

CONSUMPTION of coal in road service by Class 1 railroads during February approximated 8,546,918 net tons, according to data compiled by the Bureau of Statistics of the Interstate Commerce Commission from 164 reports of freight statistics representing 180 roads and from 161 reports of passenger statistics representing 177 roads. During the corresponding month of 1921 the fuel consumed equalled 8,377,348 tons of coal. These figures include an equivalent coal tonnage for fuel oil consumed.

For the two months ended with February these roads consumed 17,459,166 tons compared with 18,489,812 tons in 1921, a decrease of 1,030,646 tons. The revenue and nonrevenue freight ton-miles increased from 54,733,000,000 in 1921 to 55,441,000,000 this year and passenger-train car-miles decreased from 558,206,000 to 531,034,000.

Says Trade Associations Can Be of Real Service Without Violating Law

TRADE associations among coal men—associations serving for the general advancement of the trade and not as labor-handling organizations—can perform a real service in the future, according to W. K. Kavanaugh, president of Southern Coal, Coke & Mining Co., of St. Louis, Mo., which operates six Illinois mines. The Supreme Court's decision against a lumbermen's trade association in the Hardwood case does not kill "good" associations but merely upholds the anti-trust law, Mr. Kavanaugh believes, and does not make it illegal for associations to report on past transactions. The Hoover-Daugherty correspondence on the subject of "What can trade associations do legally?" seems, to Mr. Kavanaugh, to indicate for associations many proper activities that are valuable to members. He thinks that coal operators, in any future plan of co-operation between the government and coal-trade associations, should willingly furnish general information. This should not be required by law but should be accepted as the voluntary offering of associations.

"The individual coal-trade associations, children of necessity, have grown up to meet the requirements of industrial conditions," said Mr. Kavanaugh. "Many of these associations have been brought into being at government suggestion. Their right to exist, like the individual, is evidently unquestioned unless through their behavior they have forfeited such right.

"There seems to be a tendency on the part of many to consider that the decision in the Hardwood lumber case has been adverse to all association activities, precludes the making of market reports and has in fact denied to associations the right of existence. This attitude on the part of those interested in the associations' welfare seems unfortunate since, I believe—and this belief is supported by the opinion of counsel—that the Hardwood lumber case in reality merely upholds the Sherman anti-trust law, which prohibits conspiracy to enhance prices, the fixing of prices, division of territory or restriction of production through agreement. The court found that the association in question had, through certain means, violated the above statutes and forfeited its right of existence. I do not consider that the court intended to make such forfeiture on the part of the associations not guilty under the statute and I do not read into the decision therein a finding that the making of a report covering past transactions is illegal.

"The set of questions propounded by Secretary of Commerce Hoover in his correspondence with Attorney General Daugherty [printed in *Coal Age*, Feb. 16, 1922, pp. 279-300] will bear considerable study in connection with the text of the so-called anti-trust laws and the decisions of the Supreme Court thereunder by the officers and members of trade associations with a view to determining activities best suited to the needs of the membership of any given association. A careful reading of these questions and the Attorney General's reply cannot fail to leave the conviction that there are many proper activities open to trade associations. . . .

"The officers and employees of a trade association should, like any employee of a company, be active for the betterment of the industry with which they are connected. This does not mean that the officers of a trade association should violate the law because some individual might want them to, but it does mean that they should, through knowledge of the law and situations involved, prevail upon the individual members of the association *not to violate the law* should they be tempted to do so.

"There appears to be no law prohibiting the exchange of information based on past transactions so long as this information is compiled and made accessible to the public and so long as this compilation is not made the basis of agreements for restriction of output or the fixing or the maintaining of prices.

"There should be no hesitancy on the part of the individual citizen to make available to properly authorized government officials general information surrounding the operation of his business, neither should there be hesitancy on the part of a group of individuals in association.

"It is doubtful whether the best interests of the public are served by providing by law that certain specific information shall be developed and furnished to the government. It is doubtful whether the government, by categorically fixing a 'straight and narrow way' through which business may proceed, can arrive at cheapness and efficiency of operation and consequent reduction of cost to the consuming public. The government should be in position to accept, compile and distribute publicly statistics which could be voluntarily submitted without expense to the government, by the various trade associations. The government should be permitted, at its option, to check these statements submitted by the various associations as a means of assurance of their accuracy."

No Coal Famine in Kansas, Court Learns

A CANVASS of the coal situation in Kansas made by the Kansas Court of Industrial Relations shows that there is no demand, every sizable consumer, including railroads, is stocked, and that 350 cars, most of them filled with lump, stand unbilled at mines. A total of 123 co-operative mines, employing 807 men, are now working part time. They can produce 2,000 tons a day.

IN A REPORT recommending standardization of freight cars and central control of distribution of all classes of freight cars, the Agricultural Commission of the House and Senate says the supply of coal cars is inadequate to meet the demand during normal periods of activity and should be rapidly augmented.

Reports of Central Pennsylvania Mine Workers' Earnings at Variance

THERE appears to be some dispute over what the miners in central Pennsylvania earned in 1921. The following statement by John Brophy, district president of the United Mine Workers in central Pennsylvania, was introduced in the record of the Labor Committee of the House in one of its recent hearings. There also follows a letter from the president of the Central Coal Association to Secretary Davis, taking exception to Mr. Brophy's statistics. Here is Mr. Brophy's statement:

"The average earnings of 31,979 miners in central Pennsylvania for 1921 were $14.60 a week. The average net income per miner was $760 for the year. This afforded the miner, for the 365 days that he had to keep his family alive, $2.08 per day. This is from an exact tabulation of 364 mines, which covers all but a tiny fraction of the miners in District No. 2 of the U. M. W of A. District No. 2 comprises all the organized soft-coal miners in fourteen counties in central Pennsylvania. In these same 364 mines are also employed about 12,000 day men. To estimate the day men's average earnings will require fuller analysis of the data, but a preliminary calculation indicates that their earnings will run slightly higher, they may have averaged $17.50 a week, or an income giving them as high as $2.50 a day for the support of their families for the year. The data also indicate that the 364 mines averaged 122 days' work for the year, or 2½ days of work a week.

"This is a tabulation of wages based upon exact figures of production tonnage for the entire district. The tabulation was a month's work. District No. 2 is the only district which pays the checkweighman (union employees who check the company's weighing of the tonnage produced) at all mines out of a central fund. This system requires every checkweighman to file a report at the Miners' Building at Clearfield, Pa., every fortnight. Each report gives for each mine the exact tonnage for the fortnight, the number of days the mine operated, the number of miners and the number of day men.

"Each report is signed by four officers of the local union. Each of the 364 checkweighmen made 26 reports in 1921, a total of 9,464 reports in the tabulation.

"The results were: 31,979 miners worked in the 364 mines. They mined: 6,282,905 gross tons, pick mined, for which they were paid $1.2803 a ton; 2,953,559 net tons, pick mined, paid at the rate of $1.1431 a ton; 7,253,303 gross tons, machine mined, at $0.8656 a ton; 7,460,862 net tons, machine mined, at $0.7729 a ton.

"This total tonnage, 25,574,974 (net tons), constitutes nearly 7 per cent of the tonnage of the whole country. Allowing for a portion of the tonnage mined at a rate 10c. higher than the above scales and estimating the amount paid for car pushing (at the rate of 6c. a ton) as actually applying to half the total tonnage, the tabulation gives the following earnings by territories and totals:

WAGES RECEIVED BY BITUMINOUS COAL MINERS IN 1921—DISTRICT NO. 2, CENTRAL PENNSYLVANIA

Ter. No.	Net Tons Pick Mined	Net Tons Machine Mined	Wages Received	No. of Miners	Average Wage Yearly	Average Wage Weekly	No. Days Worked
1	1,819,432	2,820,773	$4,399,174	5,105	$862	$16.[illegible]	123
2	719,216	938,761	1,597,443	2,466	652	12 55	98
3	3,697,343	2,758,937	6,552,504	6,224	1,052	20 45	163
4	665,800	61,062	902,763	1,612	560	10 77	91
5	755,569	2,140,609	2,605,053	3,115	836	16.06	137
6	545,572	3,083,731	3,115,938	4,256	732	14 08	95
7	757,261	528,646	1,312,792	2,122	618	11.89	95
8	642,864	3,180,217	3,307,541	6,204	532	10 24	117
9	387,356	71,825	512,076	875	586	11.27	188(?)
Total	9,990,413	15,584,561	$24,305,284	31,979	760	$14.60	122

"The flat average annual income was obtained by dividing the total of wages paid to the miners by the total number of miners, 31,979, giving $760 for the year, or $14.60 per week. The only other source of income the miner has is the irregular sums paid for dead work or yardage, not large in this district but an item. Out of his total earnings the miner must pay for his supplies, through the company's check-off—powder, picks, blacksmithing and other mine supplies. This cost to the miner is very conservatively estimated at 5c. a ton. It may be considered in total as more than canceling the total earnings from yardage.

"Day men are paid at the rate of $7.50 for inside labor and $6.92 or less for outside. If the day men worked every day that the mines worked, the day men's average earnings would run from $50 to $915 per year, but no exact calculation is possible such as the tabulation made for the 31,979 miners. The average number of days, 122, which the mines worked in central Pennsylvania seems to be about the same as in other large districts. Operators' figures for Illinois, for example, give 126 days for the Illinois mines in 1921."

The letter from G. Webb Shillingford, president of the Central Coal Association, April 25, 1922, to James J. Davis, Secretary of Labor, follows:

"We notice in the press a letter from John Brophy, president of District No. 2, United Mine Workers of America, addressed to you, in which he states: 'The miners of central Pennsylvania protest respectfully but vigorously against the 2-per cent statistics of the miners' wages issued under authority of the Department of Labor'; also stating that your estimated average of $1,357 earnings for bituminous miners of the country for 1921 is wrong.

"For your information, the Central Coal Association has made an investigation of the earnings of all employees in central Pennsylvania [*Coal Age*, April 20, page 667], and this shows that the earnings in 1921 for mine employees in central Pennsylvania were $1,319.42 for 138 working days, or at the rate of $9.56 per day, or about $1.20 per hour based upon the eight-hour day.

"In order to show the fallacy of Mr. Brophy's figures, we wish to quote from his own testimony given before the House of Representatives Committee on Labor, Friday, April 7, 1922, in part. The cross-examination in reference to this tabulation of so-called earnings is as follows:

"'Mr. Nolan, Chairman: In reference to the figures that were given here [figures on earnings contained in Mr. Brophy's statement] I have a memorandum stating that the figures quoted do not include day laborers, 35 per cent of the total cost; the amount paid for yardage and deadwork, the amount paid for car pushing, and the amount paid for extra allowances for deficient work.

"'Mr. Brophy: It is correct that the $24,000,000 covers the tonnage mined and the day labor has not been entered into the $24,000,000 to get the total cost. When the question was asked I had in mind that you were referring to the rates paid to the tonnage workers.

"'The Chairman: No; what I had in mind was the total cost to all men connected with the mining of coal. Then this $24,000,000 does not take into consideration the day men?

"'Mr. Brophy: No.

"'The Chairman: And those other men who are mentioned here [in this memorandum]?

"'Mr. Brophy: That is correct.

"'The Chairman: I am glad that is straightened out.

"'Mr. Brophy: Yes.'

"Notwithstanding that Mr. Brophy was forced to admit that these figures were wrong, based upon partial information that did not include 42 per cent of the money paid to the workers in wages, he has the audacity to reiterate to another federal department these same figures.

"I am sending this for your information and in order that you may make proper and, I hope, public reply to Mr. Brophy, as he has published his letter to you in the press."

Supreme Court Upholds Packer Control Act

THE right of Congress to regulate industry against monopoly under the commerce clause was sustained by the Supreme Court in a decision rendered by Chief Justice Taft Monday, May 1, in upholding the validity of the packer control act. Justice McReynolds dissented. The packers attacked the act on the ground that it was unconstitutional in that the commerce it regulated was not interstate in character. The court held that in the meat-packing industry there was a continuous current of commerce from the West to the East; that it was a national public utility and that it was affected by a public use of a national character subject to national legislation. The court held that Congress may enact legislation to prevent monopoly the same as it may enact legislation to punish monopoly.

Fourth Week of the Coal Strike

EDITORIAL REVIEW

INCREASED production with increased demand and further gains in prices were the outstanding characteristics of the fourth week of the coal strike.

Preliminary estimates placed the production of bituminous coal in the week ended April 29 at 4,150,000 tons. Demand for coal has not as yet really called forth the utmost that the non-union mines now operating can produce. Even in central and southwestern Pennsylvania, where the union has closed many unorganized mines, production is slowly forging ahead.

Production in Pennsylvania and northern West Virginia in the fourth week of the strike had dropped to 75 per cent of that in the first week, but was 20 per cent over the third week. Each day in the fourth week up to and including Friday showed improvement in output.

Because of the confusion and detail of reports from this area—reports of this mine in and that mine out, this mine working with reduced forces and labor moving to other mines—it is not possible to make a definite statement as to whether the union is gaining or losing in its efforts to tie up the non-union fields of Pennsylvania. It seems clear, however, that the speed of its onslaught has been checked and perhaps it now is losing as much each day as it gains. The increase in production from this territory is doubtless largely due to the stronger demand, which is now sufficient to call forth the available non-union output in the Pennsylvania fields.

South of the Ohio and Potomac rivers production has been gaining steadily. Coal fields in eastern Kentucky, southern West Virginia, Virginia, Tennessee and Alabama by the middle of the fourth week of the strike were turning out 40 per cent more coal than a year ago or than in the first week of the strike. These fields have suffered no setbacks and so far have met each demand for tonnage that the country has made.

CONSUMPTION TWICE AS LARGE AS PRODUCTION

The Geological Survey estimates that bituminous coal stocks are being used up at the rate of 4,000,000 tons a week; the coal bureau of the U. S. Chamber of Commerce thinks 4,600,000 tons a week. At any rate about twice as much coal is being consumed as is being produced at the present time, and some of these days the country will begin scraping out the corners of its coal bin. There is still more than a million tons of unconsigned bituminous coal held on tracks at the mines. This, of course, is less than one day's consumption. In every quarter it seems to be accepted that there will be no active steps taken looking toward settlement of the controversy and resumption of work at the mines so long as there is so much coal above ground throughout the country.

Even with stocks as huge as they are, even after four weeks of the strike, there are numerous instances of consumers with little or no coal on hand. They are in the market for coal. Some others, without large stocks, are becoming a little anxious. Altogether the effect has been to advance the market week by week. Each price advance has been met with a flood of offers of non-union coal, particularly from the South. Temporary freight rates have been approved by the Interstate Commerce Commission to bring this coal into the markets of the North.

A few operators in southeastern Kentucky have signed an open-shop agreement with their miners providing for a scale based on the 1917 rate, the agreement being subject to revision on the basis of whatever may be determined in the Central Competitive Field. Many mines are working without any agreement whatever and in a good many instances union charters have been surrendered.

About 15 of the larger mines in Harlan and Bell counties are not operating at present. The union claims to have tied them up, but the operators assert that they are simply waiting for a profitable price before reopening. Much labor is drifting into the field from Alabama, Tennessee and the North, and production is increasing daily. The general market tendency is up and operators are without question improving their position against the union each day.

Chamber of Commerce Sees Coal Shortage Early in June at Present Rate of Output

THE Coal Bureau of the Chamber of Commerce of the United States, in a published statement on May 1, calls attention to the unusual condition found in the general lack of demand for coal supplies that exists throughout the country. At the present rate of production and consumption there is no danger of any general shortage, says the bureau, for at least six weeks. Summing up the situation as of April 22 the Coal Bureau says:

"On April 1 the stock of coal in the hands of railroads, industrial consumers, public utilities and retailers was approximately 63,000,000 net tons. Adding to this 4,250,000 tons estimated at the Upper Lake docks and the unbilled coal on hand April 1, there was a total of 68,650,000 net tons above ground April 1. Stocks cannot drop below 20,000,000 tons without danger of a coal panic. The quantity of coal which apparently can be drawn from stocks before a serious situation develops is 48,650,000 tons. To this supply there will be continuously added the output from the non-union fields, which up to date has averaged about 3,500,000 tons per week. At the present time the average weekly consumption is estimated at 8,100,00 tons. Therefore, supply from the non-union fields is falling short of meeting the consumption by 4,600,000 tons per week. To cover this deficit we have the 48,650,000 tons in storage. If the consumer continues to draw from this storage at the rate of 4,600,000 tons per week, unless there is an increase in production from the non-union fields, a shortage will be felt in approximately seven weeks from April 22, or until early in June.

"The above are average figures covering the entire producing and consuming areas, and rest on an even division of product and uniform storage capacity and uniform stocks on hand throughout the country. In reality, however, such uniform conditions do not exist in the different communities. If the strike continues, the ordinary lines of distribution are likely to be disarranged and result in great variation in the ability of the different communities to secure needed supplies."

Anthracite Operators and Miners Discuss Minor Demands of Workers

THREE sessions of the joint subcommittee negotiating the anthracite wage agreement held last week in New York City were devoted mainly to a discussion of the minor demands of the miners, no reference being made to the major demand for a 20-per cent wage increase. John L. Lewis, International president of the union, returned to the city on April 28 and it was expected that he would endeavor to speed up the negotiations.

The week's conferences did not resume until April 26, one day later than scheduled, but this was accounted for by the announcement that the operators were preparing their arguments to the miners' demands. On April 26 the session was devoted to a discussion of the demand of the miners for an eight-hour day, the operators inquiring particularly as to the views of the mine workers upon this demand covering the inside workers. There also was a general discussion of the result of the shorter work day in the mines of England.

At the next day's session the demand of the mine workers for a restoration of the differentials that existed in cents per day prior to the last agreement was considered.

The miners, it was announced, took the position that the fixing of a $4.20 minimum by the last commission destroyed many of the differentials that had been paid to occupations requiring more skill than common labor and that it was important that these differentials be restored. There also was a general discussion of the wage question and the cost of living.

Following the session on April 27 S. D. Warriner, for the operators, said that 47,000 workmen in the industry last year received an average of $1,803.55 each. The average earning of contract men was $2,170.40 and the lowest average annual wage was $1,439 earned by outside day men.

House Labor Committee Said to Be Favorable to Bland Fact-Finding Bill

PROPOSED federal coal legislation probably will be considered next on the floor of the House. The House Committee on Labor has concluded hearings on the bills of Representative Bland, of Indiana, proposing creation of a coal commission and a fact-finding agency and this week considered the matter in executive session with a view of reporting some legislation on the subject to the House. Opinion of members of the committee leans strongly to the second Bland bill, which proposes a fact-finding agency of ten members, including government officials, to investigate the coal situation over a period of four years. The bill also provides that companies refusing to furnish information to such an agency shall not be allowed to ship coal in interstate commerce. Representative Bland is reported as hopeful of obtaining a favorable report on this bill by the committee, notwithstanding objections made to it that interstate commerce cannot be refused an article of trade unless it is dangerous to public health or is immoral.

If a bill is reported by the committee, and indications are that it will recommend some legislation in the present coal situation because of the apparently favorable attitude manifested toward the labor side of the controversy during the hearings by its members, consideration of such a bill by the House is problematical. The bill would have to take its place on the calendar and await its regular turn unless the Rules Committee was persuaded to bring in a special rule for its consideration out of its regular order.

OFFICIALS SHOW NO CONCERN ABOUT STRIKE

In other respects the coal-strike situation is a matter of no great concern in official Washington, although reports of bombing at mines are disquieting. Reports that the administration plans to take some steps to settle the strike cannot be verified. Naturally all officials concerned with phases of the strike are studying the situation and while plans for its settlement may be maturing they are being withheld. It is not believed any action will be taken until coal stocks are exhausted and there is an acute shortage of coal by industry and the public generally, or unless riots or other violence disturb peaceful conditions.

Reports to various government departments show that the strike has not caused any slowing down of manufacturing industries. These reports are to the Department of Commerce, the Federal Reserve Board and other agencies. Industries in factory cities are reported as having large reserve stocks of coal, with plants operating under favorable conditions. Due to unemployment, however, there has been a slack in buying in retail stores in coal centers.

President Harding discussed the strike situation May 1 with Chairman Nolan of the House Labor Committee and Representative Bland, a member of the committee. No definite action is planned at this time by the administration, so far as has been learned, but a program which, it is hoped, will be helpful in bringing about a settlement is being formed.

A general reorganization of the coal industry when a settlement of the present strike is reached is said to be the desire of the administration leaders, including President Harding, Secretary Hoover and Secretary Davis. A commission has been making an investigation of the industry under the direction of the Department of Commerce.

Report of Federal Scheme to End Strike Premature; Plan Under Consideration

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

OPERATORS and mine workers alike were surprised by the statement, published on Tuesday afternoon, April 25, that the administration practically had perfected a plan not only for the settlement of the coal strike but which would provide the machinery for settling future labor controversies. As a result of this article officials in Washington were deluged with telegrams and long-distance telephone calls asking further particulars. It proved that there was insufficient justification for the very definite statements carried by the newspapers.

The report is believed to have grown out of a statement at the White House to the effect that a plan is under consideration. It is believed that there was no intention to convey the idea that the government is about to make a definite effort to bring this strike to a close. The idea evidently was to assure the public that the strike is being given serious consideration as is the whole matter of employer-employee relationship. It is known that the administration recognizes the possibility of being called into the controversy at a later date and that some thought is being given to the type of tribunal which must be set up if the strike be not settled before the public has been made to suffer to an extent sufficient to justify federal intervention.

STRIKE PROBABLY WILL RUN NATURAL COURSE

In justification of the newspaper correspondent who wrote the story it may be said that the impression frequently has been received at the White House that the administration had some big plan under way for settling the strike. This impression may not have been intended and probably has its rise in rather zealous efforts to assure the public that the administration has its fingers on the pulse of the situation. It has given the impression in some quarters that the administration is not working out skillfully its policy of watchful waiting. The real intention of the administration is believed to be to let the strike take its natural course until the parties to it are more willing than at present to work earnestly for a settlement. The chance of the parties to the strike to reach an agreement between themselves will be lessened materially if the White House continues to give out the impression that the federal government is about ready to intervene or even is willing to intervene.

Disinterested observers in Washington of the strike make the point that the operators well could take a leaf from the book of the successful political orator who never is perturbed by heckling. They point to various evidences that the operators are manifestly annoyed by the heckling they are being compelled to withstand. While it is admitted that it is difficult to remain magnanimous in the face of suggestions of foolish remedies and unfair statements of their position, their failure to meet this form of attack in a practical way is hurting them in the opinion of the public. The tactics of the operators are criticized on the ground that they seem to be engaged principally in denying everything that is said which reflects in any way on them. They seem to be striving strenuously to establish their entire blamelessness and to prove that there is absolutely nothing wrong with their own policies.

When the operators appeared before the Calder committee, every effort was made to emphasize the overdevelopment of the industry and its highly competitive character. Now the tendency seems to be one of minimizing this competitive situation. Instead of trying to explain away everything, the operators should be more intent, it is suggested, in pointing out the real difficulties under which they are laboring.

While the treason trials at Charles Town have no connection with the strike, that fact is not generally recognized by the public. News of the trials is printed by the newspapers in connection with the strike news, which increases the popular tendency to confound the two issues. The Charles Town developments are sufficiently picturesque to appeal to the newspapers. A number of special writers are attending the trials and wide circulation is given their articles. The type of story coming from at least some of these special correspondents is anything but helpful to the opinion that the public will form of the operators.

One of the outstanding developments of the fourth week of the strike was the sudden increase of production. While this was confined entirely to the non-union fields, it indicates that consumers are not going to take chances on a settlement of the strike and are replenishing their stocks. There has been a marked diminution in the number of unconsigned loads.

Strike Benefits Not Forthcoming, Many Coke Workers Return to Work

STRIKING coke workers in the Connellsville field served notice on the officials of the United Mine Workers that unless strike benefits were forthcoming they would go back to the pits and coke ovens. It was reported that no funds were available and a number of the operations resumed work. Many miners are returning to work along with the coke workers.

Organizers for the United Mine Workers have failed in their attempts to organize the miners at Ralphton, Cambria County. It is asserted by organizers that the town is so well guarded by the operators that there is no way of getting the message to the miners. At Vintondale a number of evictions were reported and there are frequent clashes between organizers and the police.

Four hundred employees of the Knickerbocker mines at Hooversville, Somerset County, held a mass meeting in the Savoy Theater last week and declared their allegiance to their employers. Organizers of the United Mine Workers have been busy in Somerset County but the men employed by the Knickerbocker company decided to remain loyal. A parade was a feature of the evening and addresses were made by leading men of the town.

The Republic district of the Connellsville coke region was the scene Saturday morning, April 29, of the first serious riot resulting from the effort of the Mine Workers to unionize the coke region. A mob demonstration occurred at the mouth of the Tower Hill No. 1 mine, in which two state police were injured, one striker shot, but not fatally, and many others suffered minor wounds, from riot clubs.

The disorders followed a mass meeting on Friday which was attended by 4,000 miners and others in which Organizers Feeney and Van Bittner made vicious remarks against operators and centered their attacks upon the guards sworn in as deputy sheriffs. They were characterized as gunmen, wharf rats, thugs and hardened criminals gathered from every city in the country.

Warning that peace and order must be maintained and that the state police would exert its full authority to maintain it was given the Tower Hill local union officials Friday following a second demonstration by women attempting to interfere with workmen entering the mine. The women were arrested and given hearings; their fines were paid by the local union. Lieutenant Charles Smith then asked the union officials if their action indicated that they countenanced the interference with workmen and a hard policy of "no more intimidation" was laid down.

A detachment of state police were on hand Saturday morning, and when 500 men and women started for the pit mouth, the riot resulted.

Utah Now Realizes There Is a Strike; Many Shots Fired and Troops Out

UTAH hardly realized there was a coal strike within its borders until last Friday and Saturday, April 28 and 29, when disturbances grew so vicious that Sheriff Kelter of Carbon County wired for troops and Acting Governor Crockett called part of the state's national guard to the colors. A minority element among the miners grew so resentful over the posting of mine guards at properties that were working, that some stone throwing and fist fighting started. A Greek striker hit Sam Dorrity, a mounted guard, with a piece of iron. The guard got into a wrangle with him which ended in the Greek shooting Dorrity in the thigh. There followed a mêlée in which about 500 shots were fired, with but few casualties. Then the sheriff wired for troops to be sent to Helper and Winterquarters.

On Friday, the 28th, the state miners' union organization proposed to the operators that the strikers return to work if the armed guards would be withdrawn and organizers allowed to meet the men and hold meetings among them. The operators refused. There was no demand for the little coal they were mining, so they were not keen to bring about any general resumption if that meant surrender at any point to the union. They have lost more from low market than from the strike, they say. A further cut in coal prices of 50c. or 75c. a ton was scheduled for May 1. This reduction is entirely due to reduced wages which working miners have accepted.

Farrington Talks About End of Strike

FRANK FARRINGTON, miners' president for the Illinois district, made a slight and vague contribution to the strike situation last week when he said in Chicago that the time had about arrived for the international organization of the union to permit state settlements and the resumption of work. He said he had information that Alabama district union officials had ordered their men to stay at work in spite of the strike order from union headquarters and that in some sections of Kentucky and Tennessee separate agreements were even now being signed. He had his usual bitter word for International President Lewis' effort to obtain government intervention, declaring he didn't think Lewis would succeed in getting it.

Mr. Farrington and miner members of the joint adjustment boards of Illinois districts 1, 2 and 3 sat with the operator groups for three days in Chicago last week finishing up the last of the routine labor disputes hanging over from before the strike. Ordinarily the joint board would not convene during a strike; but it finished up all pending cases this time at the request of Mr. Farrington.

Miners at Bridgeport, Texas, Accept Wage Cut, Pending Final Settlement

SETTLEMENT of the strike of coal miners in the mines at Bridgeport, Texas, was effected at a conference between representatives of the miners and operators in Bridgeport on April 22. The 300 miners who had been on strike for three weeks returned to work on Monday, April 24.

A temporary agreement was reached and a tentative wage scale arranged which will remain in effect until a permanent wage scale is fixed for District 21, including the States of Oklahoma, Texas and Arkansas, and the Southwestern Coal Operators' Association. Under the temporary agreement the miners will accept a wage cut of $1.50 a day and a cut of 25c. a ton for piece work.

Coal miners at Thurber and Strawn, Texas, are still out, but negotiations are under way and it is believed that the same tentative wage scale will be put into effect in these mines and that the miners will return to work pending settlement of the strike in District 21.

Charges "Conspiracy Within Conspiracy" in Perpetuating Winding Gulf Injunction

HIGH spots in the decision of Judge George W. McClintic, in the U. S. District Court for the Southern District of West Virginia, on April 25 perpetuating the injunction obtained by the Alpha-Pocahontas Coal Co. and other Winding Gulf companies were charges that the United Mine Workers of America have been in a conspiracy with the operators of Ohio, Indiana, Illinois and western Pennsylvania ever since 1898 to curtail production in West Virginia and that the United Mine Workers of America have entered into a "conspiracy within a conspiracy" to curtail production of coal in the United States in order to win their strike by creating a coal famine. The decision of Judge McClintic was rendered in connection with the motion of counsel for the United Mine Workers to dismiss the injunction restraining union activities in the Winding Gulf field.

It is stated in the decision that the defendants, including their officials, agents and members, "have knowledge that the plaintiffs operate their mines under the "non-union system," the decision adding that "if said unlawful purposes and objects be effectuated, the plaintiffs will suffer immediate and irreparable injury, loss and damage to their properties and business, for which they have no adequate remedy at law."

Captain S. B. Avis, representing the plaintiffs, declared: "It is the first time that a definite conspiracy really did exist since the finding by Judge Anderson was appealed. This will answer all arguments about the judge's jurisdiction in these injunction cases. Had he found that a conspiracy did not exist it would have materially affected the whole proceedings."

The injunction will remain in full force and effect until the further order of the court. Counsel for the United Mine Workers argued that no conspiracy existed and that only the state courts had jurisdiction in the matters complained of.

Illinois Coal Miners Could Work 218 Days A Year If They Would

COAL mines of Illinois have hoisted coal an average of 186 days a year during the last eleven years, according to Dr. F. C. Honnold, secretary of the Illinois Coal Operators' Association. He calculated, after a study of working-day figures and earnings in certain Illinois mines scattered all over the state, that the miner who really wants to work can get in approximately 18 per cent more working days than the number of days his mine hoists coal. He found that out of the total number of miners on whom he had statistics 15,511, or 36.7 per cent, worked 2,899,405 days, earning $25,293,469, or 70 per cent of total payroll disbursement. These are the men who put in 18 per cent more working time than their mines did. "Predicated on the 11-year average of 186 working days," says Dr. Honnold, "it will be noted therefore that 218 is the average number of days available each year to an industrious Illinois miner."

IN THE HEARINGS before the House Labor Committee on the coal situation, Ethelbert Stewart, commissioner of labor statistics of the Department of Labor, submitted a mass of data on the earnings of coal-mine labor, operation of bituminous coal mines, costs of production, wholesale and retail prices of coal, and costs of living in mining towns. Mr. Stewart's testimony, which presumably represents the anticipatory studies of the coal situation by the Bureau of Labor Statistics, has been printed by the House Committee on Labor as a special pamphlet of 101 pages. The forthcoming issue of the monthly Labor Review of the Bureau of Labor Statistics will also contain much of the same information.

Mr. Stewart submitted tables covering 29 anthracite collieries in Pennsylvania showing 12,105 miners who averaged 267 days during the year ending Oct. 21, 1921. The highest number of days operated by any colliery was 308 and the lowest 199 days. He estimated the average earnings during the year of these miners to be $1,892.23, assuming each miner worked every day of operation. In one mine, he said, the tonnage rate ranged from 32c. to $1.58.

Cost of living comparisons submitted by Mr. Stewart for anthracite were for Scranton, Pa., only, and showed that from December, 1917, to March, 1922, the cost of living had decreased 20.4 per cent. The decrease from December, 1921, to March, 1922, was 4.7 per cent. During the life of the former wage contract—February, 1920, to March, 1922—the decrease had been 16.6 per cent. The largest decreases were in food and clothing. Mr. Stewart was not prepared to give general conclusions on anthracite mining but insisted that in the bituminous field probably not more than 30 per cent of the best mines were needed, which would employ not over 65 per cent of the men now in the industry.

Roads File Final Brief on Bunker Freight Rates; Decision Expected Soon

ANNOUNCEMENT of a decision by the Interstate Commerce Commission is expected soon in the matter of freight rates on bunker coal, which was the subject of recent hearings. The railroads concerned have filed a final brief in the case in which it is contended that there is a distinct difference between transportation service given coals for local delivery and that given coals for ship use, and that as the delivery of coal locally involves more service, it should be reflected in the transportation rate. Other arguments advanced are that there is no competition locally between coal for local use and coal for ship use, as the latter is not burned at the port; that any rate on bunker coal is a proportional and not a local rate; that there is nothing to prevent cargo coal being used as bunker coal and that this is often done, and that any change in existing differentials will have the effect of destroying the entire coastwise and overseas system of rates, which are based on a custom of many years' standing.

In its investigation of freight rates on bunker coal the Interstate Commerce Commission has received a brief from the Smokeless Coal Operators' Association of West Virginia, contending that there is no violation of law in the present practice of applying the vessel-transshipment coal rates upon bunker coal although these rates are lower than the rates for local track delivery within the port cities. The commission is requested to give weight to the absence of complaint against this practice.

Utilities Consumed 2,710,141 Tons of Coal During March

REPORTS to the Geological Survey from central power plants, electric railways and other public utilities producing electric power, show that these plants consumed 2,710,141 net tons of coal in March, 1922. This compares with 2,600,000 in February, 2,950,000 in January, and 2,777,000 in November, 1921.

About one-third of the central-station power is produced at hydraulic plants. The increase in the water supply at these plants is indicated by the gain from 33.5 per cent in November, 1921, to 38 per cent in March, 1922, in the proportion of the total output of electricity produced by water power. The total output of electricity in February and March of this year was in excess of the corresponding months in 1920 and substantially greater than in the corresponding months of 1919 and 1921.

Strike to End About July 1, Observer Says

FRED B. ROBINSON, secretary of the Indiana State Purchasing Committee, thinks the miners will go back to work about July 1. He has arrived at this conclusion after talking with a number of Indiana operators from whom about 280,000 tons of coal is bought for state institutions each year. He expects the state committee to delay making new contracts until later in the summer, though the old contracts expire May 1.

INSTEAD OF LISTENING to prominent men in other lines of endeavor, members of the National Coal Association at their annual meeting this year will hear from men who have distinguished themselves in the coal industry. Every effort is being made to mobilize as speakers some of the best brain power engaged in coal production and distribution. The annual meeting of the National Coal Association will be held in Chicago this year. The date is May 24 and 25 and the place is the Congress Hotel.

WHEN THE 1920 CENSUS was taken there were 733,936 persons in the United States employed as workers in coal mines. The number of coal-mine operatives shown in the 1910 census is 613,924.

Defense Wins Opening Skirmishes in Treason Trial in West Virginia

EFFORT of counsel of the twenty-three officials and members of United Mine Workers on trial for treason before Judge Woods in the Circuit Court at Charles Town, W. Va., to have the indictments quashed on the ground that they were improperly drawn were unsuccessful. The defendants gained a point, however, when the court on Tuesday, April 25, upheld their demand for a bill of particulars. Under the court order the prosecution must specify the overt acts of each of the twenty-three defendants charged with traitorous acts and give the time and place of and his connection with the commission of the crimes alleged.

When the defense exercised its right to demand that each defendant be tried separately attorneys for the state elected to proceed with the trial of William Blizzard, president of subdistrict 2. Blizzard was arraigned on Tuesday, April 25, and pleaded not guilty, as did each of the other twenty-two defendants.

Progress in Blizzard's trial was slow, as the defense stubbornly contested every move by the prosecution, insisting that "the state must lay its cards on the table."

A jury composed of ten farmers, one merchant and one lumberman was chosen April 27. The prosecution called 275 witnesses and the defense 1,100.

Forty-four mine locals were listed by the state in its amended bill of particulars as having been influenced by Blizzard to contribute to funds for the purpose of levying war on the state last autumn. Officials are given by the state where they are known. Frank Snyder, president; Fred Mooney, secretary-treasurer, and Harold W. Houston, attorney, are on the list.

BLIZZARD AND MOONEY BRANDED AS CONSPIRATORS

In opening its case, the state charged Blizzard, Mooney and their associates with conspiring and executing a conspiracy to levy war against the State of West Virginia and particularly designed to nullify the effort of martial law in Mingo County and of gathering an unlawful assemblage for the purpose of destroying the sovereignty of the state. Reference was made to a statement in a printed circular issued in Charles Town about Aug. 1, 1921, in which they declared the time had come to act and that mere solutions were ineffective. This was followed, according to Attorney Belcher, by visits of the defendants and their associates to locals in different sections, when they urged miners to join in the invasions which followed.

J. F. Stewart, a union miner, took the stand as the first witness for the state. He told of seeing gatherings of armed men on Lens Creek, near Marmet, from which point the march started. He testified that "Mother" Jones addressed the men, telling them they were violating the law and advising that they go home.

Mrs. Stewart, the second witness, also told what she saw and heard at the meeting addressed by "Mother" Jones. She also told of driving her car with Keeney and District Secretary Mooney as passengers from Lens Creek, and of being stopped by an armed guard.

Governor Morgan was called to the witness stand April 28. His testimony was confined largely to a recital of his actions in issuing the martial law proclamations for Mingo County, the double call for Federal troops, the response and turning back of the armed miners. The Governor was put on by the state. He also is summoned by the defense and indicated he would endeavor to return later when needed.

Major Tom B. Davis, in charge of the operation of martial law in Mingo, and Captain Broaddus, his chief lieutenant, who was in command of the state troops at the battle of Blair Mountain, have been in Charles Town since April 26. Both are summoned as witnesses. Official announcement said that Attorney-General E. T. England, former Governor John J. Cornwell and Major-General A. A. Bandholtz had been summoned and would appear as needed.

What threatened to be a serious clash between counsel occurred May 1, when the lie was passed to the State's Attorney by Harold Houston, chief of counsel for the defense, during a warm verbal exchange over the admission of evidence pertaining to the activities of Sheriff Don Chafin and his deputies in the Logan non-union coal fields.

The fighting word was passed by Houston to A. M. Belcher, special prosecutor, when the latter intimated that the union counsel had knowledge of the fact that William Petry, vice-president of District 17, United Mine Workers, met to shoot Sheriff Chafin in the union headquarters at Charleston about two years ago. Belcher took up the challenge by declaring his willingness to meet the other belligerent "anywhere on that proposition."

The court room was thrown into an uproar as the two attorneys glared at each other. The quick intervention of Judge Woods prevented a continuation of the hostilities, which broke out when Holly Smith, one of Sheriff Chafin's deputies, took the stand to testify against William Blizzard.

Houston apologized to the Court for the scene, but there was no statement from the Special Prosecutor, and the situation was extremely tense when court adjourned for the day, after hearing testimony from several witnesses as to the armed march on the non-union coal fields last summer.

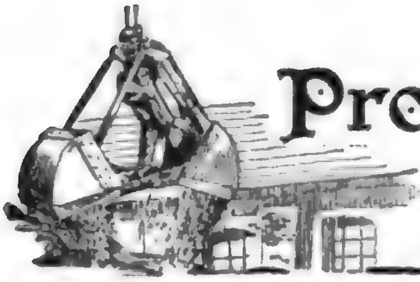
Census of Manufactures Gives Interesting Figures on Coal Consumption

SOME of the most valuable and, to the coal man, the most interesting data so far made available by the Census of Manufactures for 1919 is contained in a recent special report compiled for the use of the Committee on Finance of the Senate. What interest the coal man in this array of figures are the annual tonnages of coal, both hard and soft, consumed by each and every industry in the country. In the accompanying table are shown the industries that in 1919 used one million net tons or more of bituminous coal, or that used 125,000 gross tons or more of anthracite. This is but a selection of the more important coal-consuming industries. Many more are listed in the report from which these figures are taken. All industries included in the census, including byproduct and beehive coke manufacturing, are shown to has consumed 203,452,724 net tons of bituminous coal and 14,545,300 tons of anthracite.

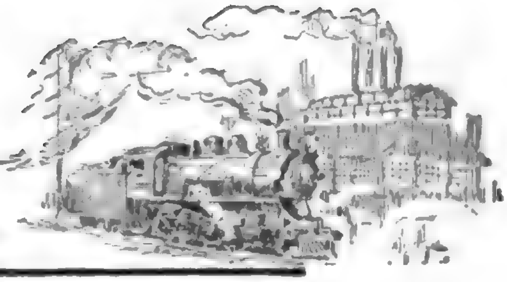
INDUSTRIES THAT CONSUMED 1,000,000 OR MORE TONS OF BITUMINOUS COAL, OR 125,000 GROSS TONS OR MORE OF ANTHRACITE, IN 1919.

(Reported by the Census of Manufactures)

Industry	Anthracite In Gross Tons	Bituminous Coal In Net Tons
Automobiles	17,133	1,120,585
Brass, bronze and copper products	200,719	655,947
Bread and other bakery products	596,989	554,982
Brick and tile, terra cotta and clay products	128,252	6,894,745
Cars and general shop construction and repairs by steam railroads	609,078	6,964,403
Cement	272,266	6,031,428
Chemicals	389,356	3,844,667
Coke, not including gas-house coke	5,808	64,245,629
Confectionery and ice cream	126,566	458,614
Cotton lace	322,668	3,610,372
Dyeing and finishing textiles, except that done in textile mills	422,855	1,071,156
Electrical machinery, apparatus and supplies	175,800	1,091,704
Flour-mill and grist-mill products	57,034	1,582,494
Foundry supplies	513,767	3,691,909
Gas	1,388,467	7,383,687
Glass	15,268	2,653,654
Ice	205,875	3,309,634
Iron and steel, steel works and rolling mills	598,944	25,911,098
Iron and steel blast furnaces	42,779	2,261,315
Leather tanned carried and finished	89,722	1,488,166
Liquors, malt, including cereal beverages	346,914	1,692,067
Lumber and timber products	15,386	1,820,058
Oil and cake cottonseed	34,763	1,172,175
Paper and wood pulp	869,948	7,863,150
Petroleum, refining	1,105,503	3,619,534
Rubber goods, not elsewhere specified	84,915	1,928,116
Silk goods	306,165	269,717
Slaughtering and meat packing	222,891	3,802,849
Smelting and refining, copper	179,026	1,088,511
Smelting and refining zinc	835,129	1,123,599
Sugar, beet	....	1,047,605
Sugar refining, not including beet sugar	406,248	987,640
Worsted goods	161,207	895,399



Production and the Market



Weekly Review

BUYING interest is moving West. The first upward trend in prices came in the second week of the strike and occurred in the New York market. The next week interest centered around Pittsburgh, where the steel companies actively entered the market to replace tonnage lost to the union in Connellsville. The fourth week of the strike, and as the fifth week begins, finds the storm center hanging over the Cincinnati gateway.

The principal demand is as yet for high-volatile coal, and the main supply of the country is now eastern Kentucky and southern West Virginia. Kentucky coals are now being marketed on a "mine-run" basis. On top of the quiet but steady buying of the steel companies comes the request for Lake tonnage. In the offing is the inevitable demand from Chicago and the Midwest as local supply of unbilled coal is absorbed. Within a week or ten days Chicago will be the center of interest among coal speculators.

INDEX OF SPOT PRICES ADVANCES 15 POINTS

Prices range over a wide spread. When prices became too high for the steel companies they ceased to bid, and the market for high-volatile coal in Pittsburgh was thereby weakened. Lack of demand in New England and abundance of Southern coal in New York Harbor combined to temper the price on any coal for eastern and northern New York line delivery. Elsewhere prices have substantially increased over last week. *Coal Age* Index of spot prices of bituminous coal advanced 15 points to 221 on May 1, as compared with 206 on April 24. Jobbers continue to be the most numerous class of purchasers of coal.

Consumers generally, both household buyers of anthracite and bituminous and industrial users, are holding off to the best of their ability, waiting for the expected reduction in freight rates on coal. From every center come reports that purchases of coal are being delayed until freights are reduced. Although demand from industries is not increasing rapidly, consumption is gaining steadily, as business over the country is picking up.

Production of bituminous coal passed the four million-ton mark the fourth week of the strike and as demand continues to increase it will go still higher. "No-market" is limiting the output of nearly every producing non-union field.

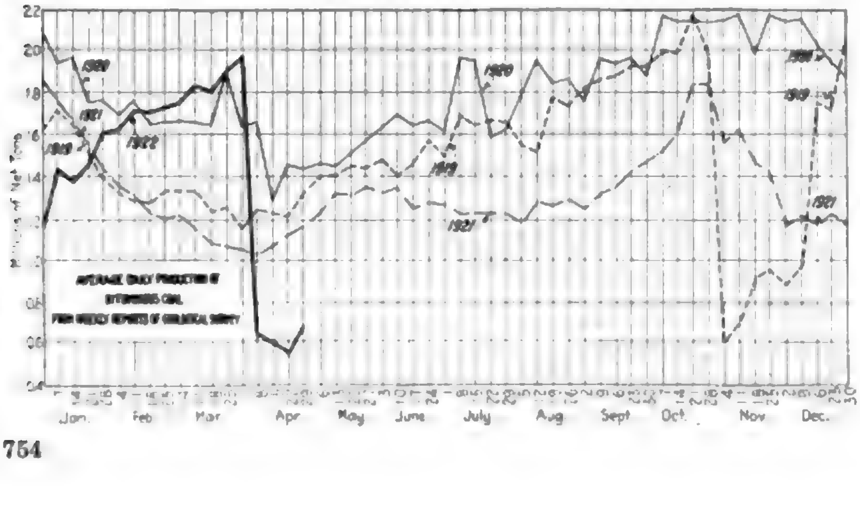
Anthracite production, of course, is at a standstill, only 6,000 tons being produced during the third week of the strike. Cold weather during the latter part of April caused a slight pick-up in retail distribution, but orders placed were only for the barest requirements necessary to piece out the season. Retail yards show the effect of the month's suspension of receipts, but domestic consumers show no anxiety over the outlook. Steam grades are about all cleaned up with the exception of buckwheat No. 1, but even with this condition there has been no urgent purchasing during the last two weeks.

Coke is a scarce article and the extremely limited offerings have brought high prices. Coke users are generally unable to pay current figures and many of them are out of the market, although ready purchasers can still be found to absorb what little coke is being made.

BITUMINOUS

In the fourth week of the strike production turned upward. The output of bituminous coal is expected to pass the 4,000,000-ton mark, according to the Geological Survey. Production of anthracite, however, remains practically zero. The Survey says:

"The revised figures for the third week (April 17-22) are 3,560,000 tons of soft coal and 6,000 tons of anthracite, a total for all coal of 3,566,000 net tons. The same week of the 1919 strike saw 5,344,000 tons of bituminous and 2,055,000 tons of anthracite produced, a total of 7,399,000 tons. The current output of hard and soft coal combined



Estimates of Production

(Net Tons)

BITUMINOUS Weeked ended:	1922	1921
Apr. 8 (*b*)	3,835,000	6,120,000
Apr. 15 (*b*)	3,656,000	6,528,000
Apr. 22 (*a*)	3,560,000	6,815,000
Daily average	593,000	1,136,000
Calendar year	140,338,000	120,167,000
Daily av. calendar year	1,485,000	1,272,000
ANTHRACITE		
Apr. 8	9,000	1,865,000
Apr. 15	6,000	1,885,000
Apr. 22 (*a*)	6,000	1,903,000
COKE		
Apr. 15 (*a*)	140,000	74,000
Apr. 22 (*a*)	93,000	73,000
Calendar year	2,216,000	2,274,000

(*a*) Subject to revision. (*b*) Revised from last report.

is, therefore, some 3,800,000 tons short of that in the corresponding period of the 1919 strike.

"Telegraphic reports indicate a definite increase in production of soft coal during last week (April 24-29). Loadings on Monday, April 24, were 12,131 cars. This was the highest since the strike began, yet it was exceeded on Tuesday and again on Wednesday, when 12,520 cars were loaded. If this rate be maintained during the rest of the week, the total output should approximate 4,150,000 tons. The trend of production may be seen from the following table of cars loaded daily:

Day	First Week	Second Week	Third Week	Fourth Week
Monday	11,445	10,772	7,898	12,131
Tuesday	11,019	10,658	10,041	12,377
Wednesday	11,437	10,961	11,088	12,520
Thursday	11,090	11,482	11,193	12,000
Friday	11,296	10,714	11,596	.....
Saturday	8,888	8,501	10,194	.....

"The increase has come largely from the non-union districts of the Middle and Southern Appalachians. It is not due to the return to work of striking miners, either union or non-union, but rather to increased demand, resulting in greater activity in those districts which have remained at work.

"Consumption is still being met largely from storage. Even at the present rate of output the draft upon consumers' stock piles cannot be much less than 4,000,000 tons a week."

UNBILLED CARS OF COAL AT THE MINES

Week Ended	Cars Bituminous	Cars Anthracite	Total Cars
March 4	14,126	1,548	15,674
April 1	28,867	2,506	31,373
April 8	30,730	2,815	33,545
April 15 (revised)	26,350	1,655	28,011
April 22 (revised)	22,836	1,254	24,090

The Lake market is now taking a considerable volume of non-union coals. Boats are clearing daily, although the movement is still below normal. Coal in two vessels at Lake Erie ports has been unloaded to meet local demands and more cargoes will be diverted if the need arises. The flow of coal to the lower ports became so heavy last week that a temporary embargo was necessary against certain Kentucky mines. The Lake market is being used by these producers as an outlet for any tonnage not finding a ready sale.

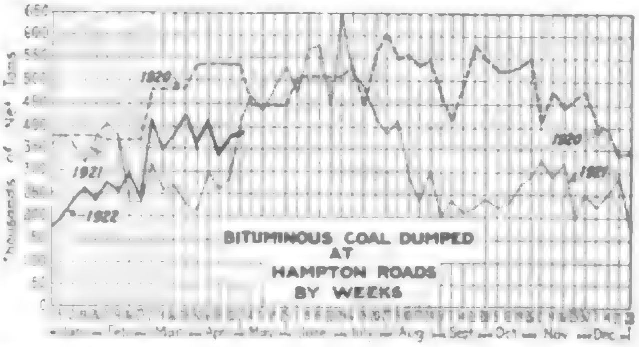
All-rail movement to New England continued to decline during the third week of the strike. Central Pennsylvania grades are finding a ready market in other sections and New England is so surfeited with coal that the higher spot quotations afford no opportunity to close orders. The situation is different at the New York piers, as shippers whose mining connections are closed are substituting considerable spot tonnage.

CARS OF COAL FORWARDED OVER THE HUDSON TO EASTERN NEW YORK AND NEW ENGLAND

Week Ended	1922 Anthracite	1922 Bituminous	1921 Anthracite	1921 Bituminous
April 8	2,702	2,130	1,867	2,526
April 15	966	1,365	2,724	2,474
April 22	371	947	2,566	2,322

(a) Figures furnished by courtesy of the American Railway Association.

Hampton Roads factors are more active. There is a strong market, especially on high-volatiles, prices on which have increased rapidly. Pocahontas quotations also are up, although not now as high as the high-volatile coals. Dumpings for all accounts were 384,677 net tons during the week ended April 27, as compared with 367,892 tons in the preceding week, and accumulation at the piers is less.



ANTHRACITE

A few cars of anthracite steam sizes dredged from the rivers continue to go forward—about 6,000 tons during the third week of the strike—but production is otherwise nil. The market is as sluggish as at any time since the strike began. Cold weather late in April temporarily aided the retailers, but no householder stocking movement is in evidence and orders are for small lots only.

The consumer can see no reason for making provision

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Apr. 3, 1922	Apr. 17, 1922	Apr. 24, 1922	May 1, 1922†
Pocahontas lump	Columbus	$2.95	$2.85	$2.85	**$3.00@$3.10**
Pocahontas mine run	Columbus	1.85	1.90	2.00	**2.25@2.50**
Pocahontas screenings	Columbus	1.15	1.40	1.55	**1.50@2.00**
Pocahontas lump	Chicago	2.60	2.50	2.30	**2.50@3.00**
Pocahontas mine run	Chicago	1.35	1.65	1.80	**1.85@2.00**
Pocahontas lump	Cincinnati	2.90	2.35	2.65	**2.75@3.00**
Pocahontas mine run	Cincinnati	1.75	1.70	2.00	**2.00@2.25**
Pocahontas screenings	Cincinnati	1.25	1.60	1.90	**2.00@2.25**
*Smokeless mine run	Boston	4.55	4.75	4.80	**4.85@5.25**
Clearfield mine run	Boston	1.95	2.15	2.70	*2.60@2.75*
Cambria mine run	Boston	2.45	2.55	3.25	*2.75@3.25*
Somerset mine run	Boston	1.90	2.25	2.70	**2.00@3.00**
Pool 1 (Navy Standard)	New York	2.85	3.40	3.65	**3.50@4.00**
Pool 1 (Navy Standard)	Philadelphia	2.80	3.15	3.45	**3.50@3.85**
Pool 1 (Navy Standard)	Baltimore	2.70	....	3.75	3.50@4.00
Pool 9 (Super. Low Vol.)	New York	2.25	3.25	3.25	3.00@3.50
Pool 9 (Super. Low Vol.)	Philadelphia	2.15	2.75	3.05	**3.15@3.40**
Pool 9 (Super. Low Vol.)	Baltimore	2.30	....	3.25	**3.25@3.50**
Pool 10 (H. Gr. Low Vol.)	New York	2.00	2.75	3.00	2.75@3.25
Pool 10 (H. Gr. Low Vol.)	Philadelphia	1.90	....	2.90	**3.00@3.25**
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.20	....	2.95	**3.25**
Pool 11 (Low Vol.)	New York	1.80	2.75	2.75	2.50@3.00
Pool 11 (Low Vol.)	Philadelphia	1.75	2.25	2.70	**2.75@2.85**
Pool 11 (Low Vol)	Baltimore	2.10	2.75	2.85	**3.00@3.15**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.80	2.90	2.50	**2.50@2.85**
Pool 54-64 (Gas and St.)	Philadelphia	1.80	2.15	....	**2.20@2.80**
Pool 54-64 (Gas and St.)	Baltimore	1.55	2.90	....	**2.85@3.10**
Pittsburgh sc'd. Gas	Pittsburgh	2.65	....	....	....
Pittsburgh mine run (St.)	Pittsburgh	2.00	....	....	....
Pittsburgh slack (Gas)	Pittsburgh	1.55	....	....	....
Kanawha lump	Columbus	2.30	2.30	2.45	**2.75@3.00**
Kanawha mine run	Columbus	1.80	1.60	2.15	**2.50@2.75**
Kanawha screenings	Columbus	1.45	1.50	1.70	**1.75@2.25**
W. Va. Splint lump	Cincinnati	2.15	2.00	2.65	**2.75**
W. Va. Gas lump	Cincinnati	1.85	1.75	2.40	**2.50@3.00**
W. Va. mine run	Cincinnati	1.40	1.90	1.95	**2.00@2.75**
W. Va. screenings	Cincinnati	1.30	1.70	1.90	**1.85@2.50**
Hocking lump	Columbus	2.60	2.65	2.65	**3.00@3.10**
Hocking mine run	Columbus	1.75	1.75	2.15	**2.75@3.00**
Hocking screenings	Columbus	$1.55	$1.50	$1.75	**$2.00@$2.25**
Pitts. No. 8 lump	Cleveland	2.90	3.40	3.40	*2.75@3.75*
Pitts. No. 8 mine run	Cleveland	1.90	2.35	2.55	**2.75@3.00**
Pitts. No. 8 screenings	Cleveland	1.70	2.20	2.55	**2.75@3.00**
Midwest					
Franklin, Ill. lump	Chicago	3.45	3.45	3.45	3.30@3.65
Franklin, Ill. mine run	Chicago	2.40	2.75	2.75	**2.75@3.25**
Franklin, Ill screenings	Chicago	2.05	2.75	2.75	**2.75@3.25**
Central, Ill. lump	Chicago	2.60	....	2.65	**2.60@2.85**
Central, Ill. mine run	Chicago	2.25	....	2.65	**2.60@2.85**
Central, Ill., screenings	Chicago	1.85	....	1.85	**1.75@2.25**
Ind. 4th Vein lump	Chicago	3.15	3.15	3.15	3.00@3.25
Ind. 4th Vein mine run	Chicago	2.35	2.50	2.50	2.25@2.75
Ind. 4th Vein screenings	Chicago	2.15	2.25	2.25	2.00@2.50
Ind. 5th Vein lump	Chicago	2.60	2.60	2.60	2.50@2.75
Ind. 5th Vein mine run	Chicago	2.20	2.60	2.60	2.50@2.75
Ind. 5th Vein screenings	Chicago	1.75	2.40	2.40	2.25@2.50
Standard lump	St. Louis	2.65	....	....	**3.00@3.25**
Standard mine run	St. Louis	1.60	....	....	**2.50@3.00**
Standard screenings	St. Louis	1.45	....	....	**2.50@3.00**
West. Ky. lump	Louisville	2.35	2.35	2.20	**2.50@2.65**
West. Ky. mine run	Louisville	1.85	2.00	2.00	**2.50@2.65**
West. Ky. screenings	Louisville	1.70	1.90	2.25	**2.50@2.65**
South and Southwest					
Big Seam lump	Birmingham	2.00	2.00	2.00	1.95@2.10
Big Seam mine run	Birmingham	1.70	1.70	1.70	1.50@1.90
Big Seam (washed)	Birmingham	1.85	1.85	1.85	1.75@2.00
S. E. Ky. lump	Louisville	2.25	2.25	2.40	**2.60@3.00**
S. E. Ky. mine run	Louisville	1.55	1.75	2.40	**2.50@3.00**
S. E. Ky. screenings	Louisville	1.40	1.55	1.70	**2.50@3.00**
S. E. Ky. lump	Cincinnati	2.10	2.15	2.40	**2.75@3.00**
S. E. Ky. mine run	Cincinnati	1.40	1.90	2.00	**2.00@2.75**
S. E. Ky. screenings	Cincinnati	1.30	1.65	1.65	**2.00@2.50**
Kansas lump	Kansas City	4.50	4.25	4.25	4.00@4.50
Kansas mine run	Kansas City	4.00	4.00	4.00	**4.00@4.25**
Kansas screenings	Kansas City	2.50	2.50	2.50	**2.50@2.75**

*Gross tons, f.o.b. vessel, Hampton Roads.

†Advances over previous week shown in heavy type, declines in *italics*.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

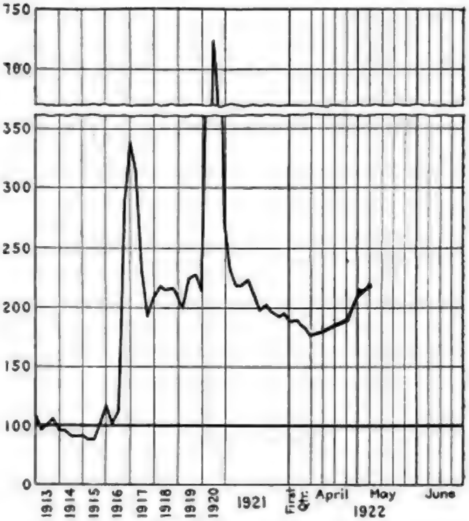
	Six Months July to Dec. 1921	Jan. 1 to Apr. 1, 1922 Inclusive	Apr. 3 to Apr. 15, 1922 Inclusive	Week Ended Apr. 15
U. S. Total	45.6	55.7	....	....
Non-union				
Alabama	63.5	64.6	73.0	69.5
Somerset County	55.5	74.9	84.6	81.9
Panhandle, W. Va.	55.3	51.3	30.8	30.8
Westmoreland	54.9	58.8	77.6	71.9
Virginia	54.8	59.9	61.0	61.0
Harlan	53.3	54.8	34.7	40.1
Hazard	51.7	58.4	46.4	49.1
Pocahontas	49.8	60.0	67.9	71.4
Tug River	48.1	63.7	68.0	68.2
Logan	47.6	61.1	67.2	68.2
Cumberland-Piedmont	46.6	50.6	8.2	8.9
Winding Gulf	45.7	64.3	63.3	65.1
Kenova-Thacker	38.2	54.3	64.7	66.4
N. E. Kentucky	32.9	47.7	54.3	55.6
New River‡	24.3	37.9	8.0	8.6
Union				
Oklahoma	63.9	59.6	19.2	17.3
Iowa	57.4	78.4	0.0	0.0
Ohio, north and central	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	0.1	0.0
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	8.5	12.0
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	12.8	11.4
Fairmont	35.3	44.0	4.2	4.8
Western Kentucky	32.5	37.7	19.5	18.2
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	0.7	0.8
Ohio, southern	22.9	24.3	0.0	0.0

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

as yet for next year's fuel requirements, as he has heard too much about reduced costs to come before that time. There is no steam demand, even though all small coals are scarce, with the exception of buckwheat No. 1. The Lake market is dormant, as all available coal has been sold in the East this spring.

COKE

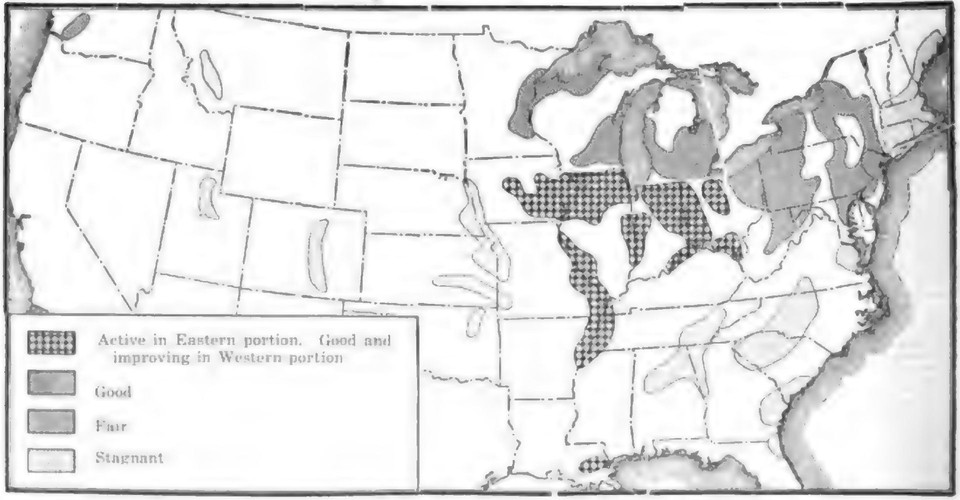
Beehive coke production slumped further during the third week of the strike. The output was 93,000 net tons, as compared with 140,000 tons during the week ended April 15. Additional closings in the Connellsville region account for this decrease. The present weekly rate of production is only 49 per cent of that in the week before the strike. Observers believe that the high tide of the strike has been reached but that the end will be slow in coming. Beehive coke is in such short supply at Buffalo that local smelting furnaces are drawing on the byproduct coke ovens.



Coal Age Index 221, Week of May 1, 1922. Average spot price for same period, $2.67. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh prices not included in figures for last week.)

West Virginia and Kentucky coals have been substituted in heavy volume for coke making at the Clairton byproduct plant. Offerings of coke are extremely light and the high prices have caused some closings of merchant blast furnaces whose supply has been cut off. The acute needs of some foundries have caused all grades to be quoted alike.

Relative Activity of Markets for Bituminous Coal at End of Fourth Week of Strike


Active in Eastern portion. Good and improving in Western portion
Good
Fair
Stagnant

Foreign Market And Export News

British Output Reduced by Easter Holidays; Glut of Small Coals Weakens Prices

BRITISH production, as cabled to *Coal Age*, slumped during the pre-Easter week. The output during the week ended April 15 was 4,384,000 gross tons as compared with 4,961,000 in the preceding week.

The market is steady, especially for the larger sizes and much May business has been taken. Smaller sizes are in oversupply. Inquiries are increasing, activity being noted recently among South American and Canadian buyers. The British Admiralty has contracted for 90,000 tons of Blyth steam at 21s. 6d. f.o.b. Scandinavian interests have ordered 100,000 tons of Durham coal at 21s. f.o.b.

There is no jubilation on account of the American strike and those in well-informed circles do not feel that the strike will greatly benefit this country. The general opinion is that buyers on the other side have pretty large stocks and are not likely to call for assistance from Britain unless the strike proves to be unduly protracted. As a result there are no efforts to meet an American demand that will probably not be forthcoming.

Hampton Roads Pier Situation

	Week Ended April 20	Week Ended April 27
N. & W. Piers, Lamberts Point:		
Cars on hand	2,739	2,569
Tons on hand	150,020	138,617
Tons dumped	177,558	188,019
Tonnage waiting	25,000	22,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,330	1,333
Tons on hand	79,250	66,650
Tons dumped	88,138	92,172
Tonnage waiting	42,000	16,000
C. & O. Piers, Newport News:		
Cars on hand	1,041	921
Tons on hand	62,050	46,050
Tons dumped	62,779	63,271
Tonnage waiting	19,000	2,251

March Exports Heaviest of the Year

Exports of bituminous coal picked up sharply during March, according to figures compiled by the Bureau of Foreign and Domestic Commerce. Shipments to Canada ran close to the million-ton mark. Latin America took more coal, as did Italy and France. The detailed figures, as well as the revised figures for March, 1921, are as follows:

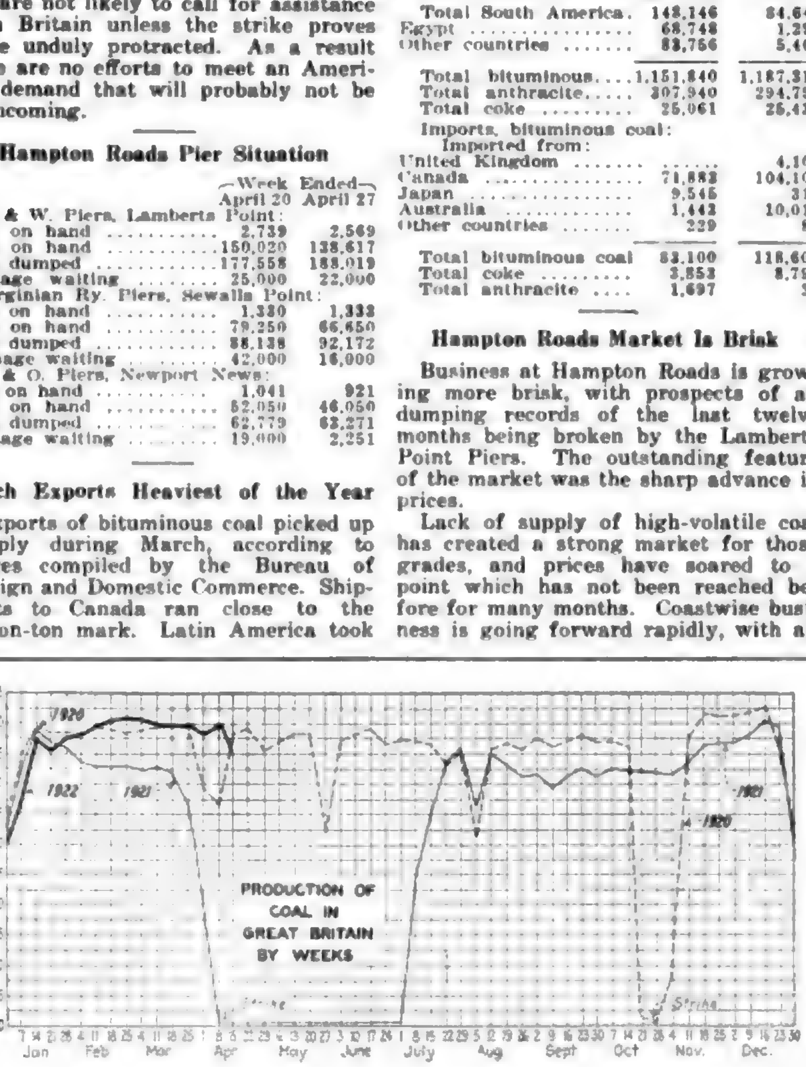
MARCH EXPORTS AND IMPORTS

	March 1921	March 1922
Exports, bituminous coal:		
By rail to		
Canada	591,557	974,321
Mexico	12,687	7,889
Total	604,244	982,210
By vessel to		
West Indies	2,784	34,077
Panama	19,657	......
Cuba	74,963	57,258
Total	97,404	91,335
France	37,728	8,227
Italy	71,517	14,200
Netherlands	26,881	......
Sweden	6,839	......
Denmark	6,577	3
Total Europe	149,542	22,430
Argentine	68,562	37,591
Brazil	52,801	40,492
Chile	26,783	6,557
Total South America	148,146	84,640
Egypt	68,748	1,297
Other countries	83,766	5,401
Total bituminous	1,151,840	1,187,313
Total anthracite	307,940	294,753
Total coke	25,061	26,435
Imports, bituminous coal:		
Imported from:		
United Kingdom	......	4,100
Canada	71,883	104,101
Japan	9,546	313
Australia	1,442	10,010
Other countries	229	80
Total bituminous coal	83,100	118,604
Total coke	3,553	8,799
Total anthracite	1,697	35

Hampton Roads Market Is Brisk

Business at Hampton Roads is growing more brisk, with prospects of all dumping records of the last twelve months being broken by the Lamberts Point Piers. The outstanding feature of the market was the sharp advance in prices.

Lack of supply of high-volatile coal has created a strong market for those grades, and prices have soared to a point which has not been reached before for many months. Coastwise business is going forward rapidly, with all available bottoms being taken in advance.



Foreign shipments were holding their own, but the bulk of the trade is moving to the North. Supplies of low-volatiles are good.

Coal Paragraphs from Foreign Lands

GERMANY—Production of coal in the Ruhr region for the week ended April 15 was 1,578,000 metric tons, according to a cable to *Coal Age*. The previous week's output was 1,908,000 tons.

ITALY — The price of Cardiff steam first is quoted at 42s. 9d., according to a cable to *Coal Age*, unchanged from last week's quotation.

It is not expected that consumption of imported coal will reach the pre-war maximum for a considerable period, says a report to the Department of Commerce. However, the quantity of coal imported in 1921—7,653,000 tons—is not sufficient to meet Italy's requirements under normal conditions, and a gradual increase to about 9,000,000 tons per year may be expected when business conditions improve. At present, consumption has been reduced to not much more than 3,000,000 tons.

Export Clearances, Week Ended, April 27, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Nor. S.S. Bur, for Fort de France	6,401
For Canada:	
Dan. S.S. Olaf L. Kongsted, for Montreal	4,543
For Colombia:	
Nor. S.S. Tosto, for Cartagena	987
For Cuba:	
Dan. S.S. Rolf, for Havana	2,691
Swed. S.S. Mongolia, for Havana	2,029
Dan. S.S. Sarmatia, for Havana	2,983
For Italy:	
Jap. S.S. Fuiji Maru for Portoferrajo	8,272
Am. Schr. Percy R. Pyne II. for St. Georges	2,038

Pier and Bunker Prices, Gross Tons

PIERS

	April 22	April 29†
Pool 9, New York	$6.15@$6.40	$6.15@$6.40
Pool 10, New York	5.80@ 6.10	5.80@ 6.10
Pool 9, Philadelphia	6.10@ 6.50	6.10@ 6.50
Pool 10, Philadelphia	5.75@ 6.10	5.75@ 6.10
Pool 71, Philadelphia	6.50@ 6.65	6.50@ 6.65
Pool 1, Hamp. Rds	4.75@ 4.85	**4.75@ 5.25**
Pools 5-6-7 Hamp. Rds	5.00	**5.25@ 5.40**
Pool 2, Hamp. Rds	4.75	**4.75@ 4.85**

BUNKERS

	April 22	April 29†
Pool 9, New York	$6.45@$6.70	$6.45@$6.70
Pool 10, New York	6.10@ 6.40	6.10@ 6.40
Pool 9, Philadelphia	6.40@ 6.55	**6.40@ 6.60**
Pool 10, Philadelphia	5.85@ 6.25	**6.00@ 6.40**
Pool 1, Hamp. Rds	4.85@ 4.90	**4.95@ 5.00**
Pool 2, Hamp. Rds	4.75	**4.90**
Welsh, Gibraltar	40s. 6d. f.o.b.	**41s.** f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	42s. f.o.b.	**43s.** f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	42s. t.i.b.	**43s.** t.i.b.
Welsh, Messina	38s. f.o.b.	....
Welsh, Algiers	38s. 6d. f.o.b.	**41s.** f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	40s. f.a.s.	**42s. 6d.** f.a.s.
Welsh, Teneriffe	38s. f.a.s.	**40s. 6d.** f.a.s.
Welsh, Malta	42s. f.o.b.	**44s. 6d.** f.o.b.
Welsh, Las Palmas	40s. f.a.s.	**40s. 6d.** f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	**57s. 6d.** f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Alexandria	45s. [illegible]	45s.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	April 22	April 29†
Admiralty, Large	28s. 6d. to 29s.	*28s. 6d.*
Steam, Smalls	19s. to 20s.	19s. to 20s.
Newcastle:		
Best Steams	23s. 9d. to 24s. 3d.	*23s. @ 24s.*
Best Gas	24s. to 24s. 6d.	*23s. @ 24s.*
Best Bunkers	22s. 6d. to 23s.	*22s to 22s. 6d.*

†Advances over previous week shown in heavy type; declines in *italics*

North Atlantic

With Diminution of Reserves Market Shows Firmer Tone

Flurries Disappear—Coal Scarce and Price Trend Upward—Small Buyers in Market, Larger Ones Make Inquiries—Southern Coals Counteract Bullish Tendency.

A DIMINUTION of coal reserves is gradually causing a firmer tone to the market, which is strong and without the flurries that marked the transactions of a week or two ago. Coal is scarce and prices show an upward trend. Small buyers are coming into the market and large ones have reappeared, to the extent at least of making active inquiries.

Southern coals from Hampton Roads are making strides in the North Atlantic markets. This factor is a restraining influence on a distinctly bullish coal market. Line business is good but at New York Tidewater, however, there is a trace of softening, under the volume of coals from the Roads.

NEW YORK

The local situation is quiet and is largely affected by the receipt of upward of 50,000 tons of Southern coals during the past ten days. It is still coming forward and is being quoted by some houses at $6.40@$6.75 alongside. Cars on hand at the various loading piers on April 28 were about 500 less than on the corresponding day of the previous week. Buyers have not yet been forced to enter the market, although they are digging into their reserve piles.

Some mines owned by local houses are now idle, with the result that these producers have been forced into the market in order to keep up with their contracts. There are many inquiries but few actual orders.

Where it is impossible to locate immediately a shipment of classified coals, buyers are willing to take other coals, provided they are about as good in quality.

A few days of good demand would, it is thought, cut a big hole in the available tonnage and might result in stronger quotations. As conditions now stand it is believed that the quotations given are higher than the actual selling prices, so anxious are some producers and middle houses to get rid of their coals.

BALTIMORE

A number of larger consumers are represented in the market and their purchasing is rapidly growing to be an emergency condition. Until the present there had been shown no anxiety on the part of many large consumers, but the fact that they are now eating into stocks has put a number of the larger purchasing departments on edge. The result is that the entire bituminous situation is growing tighter.

There is very little Pennsylvania coal offering. Some of the low-volatile group sold here at the opening of the week at $3.50@$3.75; high-volatile commands $3.75@$4. Even at these prices, which are showing indications of a still further jump, there are few offerings as most of the non-union mines which closed down recently still remain inoperative.

PHILADELPHIA

The market seems ripe for almost anything. While there is no strong demand by the smaller buyers, yet when he does arrive in the market he is just a trifle shocked to find how prices have increased since his last inquiry. The inquiries are not many and the buyer has generally been able to get coal from somebody, but it is not going to take much greatly increased buying to arrive at the point where some consumers will have to be advised that they cannot have coal.

As it is now the highest quality coals are almost out of the market. Under these conditions it would be altogether possible for a runaway market to start over night. Prices hold fairly firm as compared with last week's quotations, and there are signs of higher prices plainly evident and at times actually quoted.

As showing this tendency to get better prices there is much offering of coal around among the brokers. There is one factor that tends to hold back prices and that is the arrival of Southern coal.

FAIRMONT

There was hardly as strong a demand in northern West Virginia at the end of the third week of the strike. Prices, however, were on a much higher scale than at the outset of the strike. Railroad fuel buying was heavier. Ninety mines out of the 550 were operating at the outset of the fourth week of the strike.

UPPER POTOMAC

There was comparatively little change in conditions during the third week of the strike. There were a few more mines at work than during preceding weeks. With a slight improvement in market conditions, additional mines are expected to resume operations at the solicitation of miners who have been in idleness for some time.

CENTRAL PENNSYLVANIA

The fourth week of the strike ended without any material change in the situation. Both sides claim gains. The outstanding feature of the week was the injunction proceedings in Somerset County, instituted by operators to restrain the union from violence, intimidation and other illegal measures in organization work.

Production is largely confined to the mines in and about Johnstown and in sections of unorganized territory in Somerset County. A large number of empty cars are being stored in the railroad yards at Hollidaysburg, pending the settlement of the strike. The number of train crews on the Pennsylvania is being reduced.

Coke

UNIONTOWN

There appears to be a good market for coal with prices, however, below $3 even for the best grades. The impression prevails that large industrial consumers have placed a price limit upon coal and when they are asked to pay above that limit they will withdraw from the market and adjust their affairs as best they can. In any off event, the market here may be reported as firm but easy with no distress signs showing and any panicky feeling absent.

Such tonnage as is available can find a ready buyer at $2.50@$2.75 for Sewickly steam, $2.50@$2.75 for Pittsburgh steam and $2.75@$3 for byproduct.

Coke has become a scarce article, especially foundry, with the result that grades have disappeared, much furnace coke commanding the price usually given foundry. That situation was brought about by the acute need of some foundries. Coke, consequently is quoted at $6.25@$6.75.

CONNELLSVILLE

There has been no further spread of the striking in the past week, and a few of the strikers have returned to work. Taking the region as a whole, production of coal is approximately one-third of what it was in the latter part of March.

The best judgment is that the striking will not spread farther, but that the men will be slow in returning to work. There may be considerable straggling back in the next week or two, but in general the striking may be fairly strong a month hence.

The operators' policy at present is clearly and positively outlined, that men who desire to work will be given the fullest possible protection, and moral suasion will be employed intelligently, but there will be no strike breakers, evictions, etc.

The Steel Corporation's output of coal and coke is reduced much more than was expected, and vigorous measures have been taken to make up the deficiency. Until recently there have been heavy purchases of West Virginia and Kentucky coal, to supplement the stocks at the Clairton byproduct plant, which it is understood is now assured of a steady operation indefinitely.

The *Courier* reports coke production in the week ended April 22 at 47,900 tons by the furnace ovens and 17,080 tons by the merchant ovens, a total of 64,980 tons, a decrease of 33,830 tons.

BUFFALO

The local smelting furnaces are increasing their activity and drawing on their own byproduct coke ovens for supplies, as the beehive plants are generally idle. Jobbers get next to no orders, so that prices are about nominal at $5.25@$5.50 for 72-hr. Connellsville foundry, $4@$4.25 for 48-hr. furnace and $3.50 for stock, at the ovens.

Anthracite

Orders Only for Bare Needs; Await New Cost Conditions

Cold Weather in April a Windfall to Retailers—Pea and Buckwheat Still to Be Had from Storage—Sales Bring No Premiums.

COLD weather during the latter part of April supplied retailers with some additional business. Orders were confined almost entirely to the barest needs to eke out the season, however, as consumers are convinced that the wise policy is to delay stocking until production is again resumed. The impending freight rate reduction also is delaying any buying for future needs.

Pea is still available from mine storage, as is buckwheat No. 1, but the larger domestic sizes have been cleaned up. The smaller steam coals are scarce but there is no strong demand even for those sizes that are available. Coal is still afloat in New York Harbor, but such as is sold is not commanding any premium.

BOSTON

Except for two or three of the large producing companies who have stocks of odd sizes, practically all domestic has now been picked up and absorbed. While there has been more or less steady inquiry for what domestic sizes were available, there has been no snap to the market and only through constant pounding have the companies been able to place what coal they had.

Retail business has been extremely light, except for spells of cool weather that have obliged householders to keep their furnace fires.

NEW YORK

With most of the domestic coals in boats wholesale dealers are finding it difficult to dispose of their holdings. Buyers are conservative and are not adding to their stocks unless it is absolutely necessary. Most of the large retail dealers are still well supplied.

Although conditions during the past 10 days have been such as to induce good fuel consumption and a depletion of retail dealers' stocks, the latter have not entered the buyers' market to the extent of taking coal at any price.

So far as the public seems to be interested there is no suspension and consumers are showing no anxiety over a possible shortage of coal later on.

The situation might be changed considerably were it not for the reports emanating from Washington that the I. C. C. is expected to lower freight rates by June 1. These reports and the possibility of a reduction in the mine price of coal cause many consumers to refrain from putting in their next winter's fuel supply.

Most of the coal being offered is quoted as "stock" coal and is afloat. Some middle houses are said to be quoting around $9 for stove and chestnut but there are no takers at those figures.

Demand for the steam coals has not picked up and quotations do not indicate the strength that should be expected under present conditions. There is some river barley being offered on a basis of $1.10@$1.20.

BUFFALO

Demand is about as small as it has ever been at this time of the year and the sellers do not try to push it to any extent, unless they have independent coal and they have difficulty in getting the 75c. or $1 premium that they demand on the ground of heavy cost.

The supply of stove is very short and egg is not large, but the consumer does not complain, for he has enough coal. The retailer is complaining, of course, for he is mostly idle.

At this time of the year it is common to cut out the furnace and depend on natural gas, which will last till cold weather. So the anthracite situation is fully as easy as any.

No effort has been made to move coal by Lake. The shipping companies have a supply, but they prefer to hold it in the east at present. Unusual activity is shown in bituminous Lake receipts from Ohio ports, which go to the Buffalo furnaces. Already four cargoes have come in, showing that some source of that coal is good.

ANTHRACITE FIELDS

Quiet prevails throughout the region. A few washeries that had been operating in the Southern field are now closed. There is a little washery activity in the vicinity of Scranton.

The opinion of the miners will have to change considerably before there can be any real attempt at settlement made by the union leaders in New York. With the men demanding an increase it would be suicidal for their representatives to suggest any concessions at the conference. Their present positions depend on securing at least the acceptance of the present wage.

PHILADELPHIA

Temperature during April was below normal, and this has enabled the retailer to move considerable coal. All yards show evidence of decreasing supplies.

Buying has been moderate, but with yard forces already reduced some dealers report themselves as busy. This extra buying to piece out the season has also caused consumers to raise the question as to being supplied during the summer.

Retailers continue fearful that mining may be resumed and they will be left with high-priced coal on their hands, but as each day passes they are nearing a margin of safety and feeling a little easier.

The companies still have much pea coal for sale. Offices of the shipping companies are a picture of absolute idleness, and it is becoming a rule with most of them to have their employes take their usual summer vacations during May, in order to be prepared for resumption of work.

In the steam coals the companies are moving buckwheat in fair volume, as the demand is slowly increasing. There is very little rice and barley to be had now. There have been numerous offers of river coal of these last two sizes at prices around $2@$2.50 for the former and $1.50 for the latter, but with few sales made locally, as even in the times of greatest scarcity this material has found it difficult to make a market here.

BALTIMORE

The only feature here has to do with the fact that several dealers have reported that they are virtually out of supplies. Fortunately, there is practically no demand and the only real danger lies in the possibility that the trade will be unable to catch up in the months to come on business which is usually put across during April and May. There is no run of hard coal to Baltimore at present from which the yards can be replenished, but no one seems to be worried over the outlook.

West

KANSAS CITY

Some demand for steam grades is being manifested in some quarters, by the companies who stored only about 30 days' supply, and who are beginning to see the bottom of their storage piles. No apprehension is felt, however, as there is ample supply of lump and nut and some mine run from small co-operative mines in Missouri and Kansas.

It has been a hard year for the retail coal man in this section who bought long ago at top price, went through an open winter and now is overstocked with coal costing a dollar above the present market.

SALT LAKE CITY

Utah does not appear to be seriously worried about the strike in spite of the outbreaks of the last few days which resulted in a call for State troops. Most of the trouble is said to come from a small foreign element and most of the other miners are not only willing to work but are on the job.

The retail business took a big drop last week with the arrival of warm weather. The dealers of Salt Lake City were not stocked heavily and now, with the demand gone, they are happy that their yards are almost clear. They anticipate a fall of prices before they stock again.

DENVER

The Colorado market remains almost undisturbed by the strike and its developments. Demand is light in most quarters and practically flat in the domestic trade.

More mines continue to reopen following the cessation, but in some cases they have trouble in marketing the product. The William E. Russell Coal Co.'s mine, near Frederick in the northern lignite region, is reported to have begun work again.

Chicago and Midwest

Western Kentucky Stirs Whole Midwestern Region

Suddenly Finds Lively Cash Market So Up Goes Price to $2.75 with $4 in Prospect—Looks Like Jobber Speculation to Some.

THERE is a great bestirring-to-life in western Kentucky. It was the one outstanding feature of the coal situation in the Midwest during the week. Following in the wake of the steel region flurry of two weeks ago, buyers went into western Kentucky—then practically closed down—and startled the whole field into action with cash offers for immediate delivery. The prices stiffened at once to $2.50@$2.75, mine run, and the operators are selling from day to day, believing they will soon be getting $4. "Some jobber speculation is figuring in that," said a big operator, and some others were ready to agree with him.

This particular coal has penetrated into almost every Middle Western market east of St. Louis but it has not caused any noticeable stir that far west. In that general region there is a slow and steady flow of hold-over fuel from the southern and central Illinois fields which have by no means exhausted their stocks at the mines, though screenings are practically gone. Prices on coal from the southern counties holds fairly firm at the old prices—$3.25@$3.65 for prepared sizes—but there is a tale here and there of shading on the part of people who think they can see the end of the strike in sight. Other quotations are shown in the weekly review.

Steel and railroad demand, that picked up recently, still continues in fair proportions but it is causing no excitement. Many queries from dealers have been coming in during the past few days indicating, possibly, a certain anxiety over a hoist in prices.

Some smokeless coals continue to reach the Chicago region but the volume is falling off noticeably. The price is slowly and steadily on its way up. Lump, at the end of the week had attained $3 and mine run was almost generally quoted at $2.

Anthracite in the Midwest region is exciting no interest and prices remain fairly firm at pre-strike levels. Egg is quoted at $7@$7.50, stove at about 25c. better and buckwheat, $3@$3.50.

The trade is awaiting with keen anticipation some announcement on freight rates. Although few men pretend to have any definite idea of what the commission will do to rates, they look for a reduction of at least 10 per cent. So many buyers consider present rates a great deterrent to purchasing, that everybody is keen for a decision at once by the commission.

CHICAGO

Only a slight pick-up in trade was noticeable in the Chicago market during the past week. There were inquiries galore, and some of these came from the domestic trade in cases where retailers got the idea that coal may never be lower than it is now, but in general the apathy of April continued.

The principal interest centered in western Kentucky. This coal began coming this way in moderate quantities following a resumption of work by several mines of that field. Most of it is mine run selling $2.50@$2.75. There is practically no call for the lump and egg. The result in these sizes will not bring as much as mine run. One Chicago operator said he knew of western Kentucky lump coming into this market to be crushed and sold as screenings.

Only a little Pocahontas is seen here nowadays. The flow from the mines apparently is in another direction. However, quotations are climbing slowly. It is hard to find any screenings at last week's price of $1.75. The average is now close to $2. Lump is quoted $2.75@$3 with but little call.

SOUTHERN ILLINOIS

In the Carterville field there is a gradual thinning out of coal held for commercial purposes, but railroad coal is still found at certain places in abundance. Somewhat similar conditions exist in the Duquoin, east Jackson County, and Mt. Olive districts. In the Standard field there are some domestic sizes but steam grades are pretty well cleaned up.

In all of the fields screenings have long ago been taken care of, as well as the smaller sizes of nut. Here and there a car of egg may be found and there is a fairly good supply, at places, of 2-in. lump and some 6-in. lump. Prices in this district range from $2.50 for the steam coal up to $3 for 2-in. lump and $3.25 for 6-in. lump.

LOUISVILLE

Within the past 10 days the situation has been changed entirely in the Kentucky coal fields. Demand like a salmon run has finally set in strong. Jobbers are having trouble in placing orders, cash is talking, some concerns are failing to ship on low-priced orders and contracts, and buyers from other markets and big industrial consumers, are invading the fields, with cash in hand ready to buy quick.

Lake movement met with a short embargo. Steel demand is very good, and general industrial, utility and byproduct demand from the Northern and Central states is increasing with better prospects from the Eastern districts. Operating time in both the eastern and western Kentucky fields is increasing rapidly, and many small mines are sold up for a week or ten days and are not accepting additional business, while some of the big operators are putting out stiff prices, and holding for them, rather than be tied up with any cheap business.

During the past week eastern Kentucky has cleaned up most of the lump coal unsold on tracks, and is now asking $2.50@$2.75 with many concerns holding for $3 on mine run. Screenings and lump are bringing the same prices, as there are practically no screenings to be had. In western Kentucky operators are figuring $2.50@$2.65, mine-run basis, and will screen out screenings lump at the same prices.

INDIANAPOLIS

Demand is much below normal but dealers and wholesalers here expect it to pick up soon. There is sufficient coal on hand to last Indiana sixty days. Prices have not changed. However, at the convention this week of the Indiana Retail Coal Merchants' Association, many speakers urged members to buy now before the price jumps.

ST. LOUIS

A little domestic demand appeared during the past few days on account of rainy and chilly weather. But purchases are small and nobody is stocking.

Locally steam is slow. There is a little call occasionally for screenings, but that is all. A little Kentucky coal is moving in at about $2.10 for mine run and $2.25 for 1½-in. lump, with nut at $2.25@$2.35. The quantity is small with the exception of a few hundred cars of lump and mine run bought by the Frisco as an emergency precaution.

It is understood that the Union Electric Light & Power Co. went in the market for about 20 cars per day of West Virginia coal to come forward for the next thirty days. Other than that the purchases have been for a few cars at a time and business has been scattered and not worth while.

WESTERN KENTUCKY

During the past week many mines that had been down resumed operations, and more are coming in each day. From about 1,100 cars on track in early April, there are now about 300 cars of unsold coal, practically all lump. Some mines are operating full, filling contracts and orders accepted at lower prices. Other mines are holding firmly for $2.50@$2.65 and higher. The market may reach $3 before the end of the first week in May and possibly keep on going.

Mines on the Illinois Central started advancing before those on the L. & N., but are all advancing now as a result of better demand from North and South. Tonnage is moving to Wisconsin, Illinois, Missouri, Michigan, Georgia and Indiana. It is also reported that inquiries have come from as far as Pennsylvania.

Canada

TORONTO

Dealers report a moderate demand for anthracite and sufficient supplies on hand to meet requirements for some time. Consumers are only buying from hand to mouth and few large orders are being received. Some bituminous coal is coming forward from the West Virginia mines, in quantities about sufficient to supply the light current demand. Quotations for anthracite are unchanged, but bituminous prices are unsettled with an upward tendency.

Northwest

Strange Signs of Life Quicken This Region

Demand Still Light But Inquiries Grow Numerous—May Start Counter-Flow of Dock Coal Eastward First Time in History—Most Prices Weak.

A QUICKENING of industrial demand, so slight as to be barely noticeable, has begun to make itself felt. Iron mines and blast furnaces near the Head-of-the-Lakes show signs of activity. Demand is still dull, however, and prices are soft on everything except screenings. Figures on that class of coal are firm only because screenings are scarce, and not because anybody wants to buy much. Domestic demand has about died out.

Coal by vessel is flowing into the Northwest ports now in a stream only slightly more than half as strong as is normal. Some of the docks have inquiries from Middle Eastern consumers which may result in dock coal moving eastward for the first time in history.

DULUTH

Duluth may soon be "Carrying Coals to Newcastle." Inquiries have been received by local docks for coal to be delivered to Lake Erie ports and to Chicago. This is unprecedented. The inquiries came from two large steel manufacturing concerns.

Three cargoes of coal have already arrived at Duluth harbor; the first to come in through the ice field in Lake Superior this year. Two more cargoes are reported on the way. These latter cargoes are consigned to The Zenith Furnace Co. of Duluth, and will permit that concern to run throughout the remainder of the summer.

Noticeable increase in the inquiry for coal has been evident here within the last few days from manufacturing concerns. Announcement by the Minnesota Steel and Zenith Furnace companies that their blast furnaces would be blown in, and that the manufacture of steel would be resumed here, has stimulated trade generally.

Inquiries from various parts of the Northwest have been received within the last few days. Two iron mining companies on the Mesaba Range will start operations early in May. This action has not as yet been reflected in increased shipments from the docks. Anthracite is moving far below normal. Buyers generally are expecting a drop in hard coal prices.

Bituminous coal is still selling at $7 for lump with some dock men willing to shade 50c. for large orders. The only indication that prices are on the make comes through the decreasing number of docks which are willing to shade the list price. The outlook for the Head-of-the-Lakes may be summed up as optimistic for increased trade.

MINNEAPOLIS

No one seems to mind the strike. Wholesalers and retailers say buying is all in small quantities, obviously for immediate needs. Retail orders are down to very small amounts. Despite this there is constant reference in the daily press to threat of a coal shortage. Just why, is unknown. There is an ample supply of coal on the docks, and more on track.

There has been no effect upon prices, aside from a strengthening of screenings, which are in lesser supply because there is less shipment of the larger sizes and so less screenings produced. The firmer screenings prices cannot be laid to the strike. So instead of there being any strengthening of prices on regular sizes of coal, the tendency is the other way. Some company prices are not up to list on dock coal and others complain they cannot get any business because of this cut. And this is in the face of a strike which is charged with having been brought about for the purpose of forcing higher costs on coal now on hand!

Industrial activity shows only a slight gain. On the other hand, there is a reduced consumption of those industries which have water power, since the high water has given them the maximum water power possible.

MILWAUKEE

Apathy rules the coal business both locally and in country trade. This condition, dealers expect, will continue until some basis is reached as to future prices. The old level of prices is strictly maintained. There is plenty of coal, both hard and soft, to be had except soft coal screenings. This grade is very scarce and tight. Western screenings are selling at $3 per ton.

Thus far this season 10 cargoes of soft coal, aggregating 80,600 tons, have been unloaded at the docks, and three more cargoes are booked to arrive in the next two days. Last year up to this time 9,000 tons of hard coal, and 109,944 tons of soft coal, or 118,944 tons in all, had been received by this time.

Coke is being offered with a guarantee that present prices will hold until July 1, the difference to be refunded if the price should drop before that time. Coke is being delivered at $11.50 for egg and nut, and $9.50 for small nut. This is the price established in March when a cut of $2 was made in order to move stocks.

New England

Asking Prices Slightly Up, But Distress Sales Continue

Oversupply in Reserve Emphasized by Continuance of Textile Strike—All-Rail Receipts, Especially from Central Pennsylvania, Light — Sales at Prevailing Rates Difficult.

THE trend of the Hampton Roads market is upward and asking prices in New England reflect this to a lesser degree. On the other hand, this market has such an oversupply of coal in reserve and waiting to be sold that the purchaser can still obtain tonnage on a "distress" basis. The textile strike continues and there can be only one result to stuffing this market until consumption has eaten into the heavy stocks of industrial consumers.

All-rail receipts, especially from central Pennsylvania, have been very light. Prices for these coals have been increased in other markets and sales in New England at the present quotations are almost out of the question.

There is no denying the firm trend upward that is now in progress at Hampton Roads. So many New River operations have been shut down through efforts to extend union influence that increased inquiry has been thrown to the Pocahontas shippers. Certain agencies have already made $2.25 per net ton their asking price, a figure that would mean $5.33 at the Roads. While the current spot market has sagged a little as to price at this writing, $5 flat is now a fair quotation for Navy Standard, 15c. better than a week ago.

At this end, however, especially for Inland distribution, the market has been affected by a temporary oversupply to such an extent that prices have receded, rather than advanced. There is still distress coal that factors are forcing on the market and on-car prices have been made as low as $5.75 per gross ton to move tail-ends. The textile strike continues and there seems little object in further stuffing the local market here until consumption has eaten into the very heavy reserves that are on hand with most consumers.

Marine freights, Hampton Roads to Boston, are easy on the basis of 90c. for large vessels and barges, with smaller bottoms at $1 or more, according to draft of water and handling facilities. From New York to Boston small box barges can easily be had at $1 flat. In every direction, there is a surplus of tonnage.

The keen competition for steam coal business is reflected at retail in Boston. While the asking price on high grades is $8.25 per net ton delivered, actual prices run down all the way from $8 to $7 flat on special short-term contracts. From the appearance of things here one would never suppose mining had been suspended in large numbers of operations now for 30 days.

Eastern Inland

Scarcity of Tonnage Believed To Presage Lively Market

Stocks Shrink with Industrial Improvement—Upward Tendency in Prices and Expected Freight Cut Delay Buying—Lake Business Shows Progress.

STOCKS are going down more rapidly as the industrial situation improves. There is no great spot demand as yet except for byproduct coal, but tonnage available is so scarce that shippers are anticipating a lively market in the near future. Quotations show an upward tendency and this coupled with the expected reduction in coal freights is causing consumers to delay purchasing, utilizing their reserves in the meantime.

Lake business is progressing although the tonnage moved is almost entirely on a spot basis. Non-union producers are sending heavy supplies to the lower ports and shipments from Kentucky were so heavy that temporary embargoes were placed against certain mines last week.

CLEVELAND

With general business activity increasing and stocks of coal diminishing the market is beginning to show more signs of life. Inquiries from steel mills and general industries are increasing and railroads are buying. Little coal is moving from dealer to consumer, however, because it is not available.

Developments are showing that many industrial users miscalculated before the strike began. The chief trouble with their judgment was that they failed to foresee the extent of the recovery of business which is now appearing. Many plants in March had sufficient coal to run them for 60 days or more after the strike began at the rate of operations then prevailing. Since then sales have picked up and stocks are melting more rapidly than had been expected.

Prices are not bounding upward but operators look for higher figures before the strike is over.

No real resumption of output is believed possible before June 1. In the meantime an interesting development has been the unloading of vessels at lower ports to meet the requirements for fuel needed here.

COLUMBUS

With practically all of coal on track cleaned up there is a better demand for all grades except domestic. Apparently the effects of the strike are beginning to show

Buying of byproduct coal is the best feature of the market. A considerable quantity of Pocahontas is being bought by plants in the Buffalo section to be shipped to the Lake and transshipped by water to destination.

Prices have advanced materially. This is especially true of mine run which is now ranging at about the same level as lump. Dealers as a rule are not taking on stocks, being interested more in cleaning up. Retail prices have advanced slightly, but not as much as prices at the mines.

Indications point to a better Lake Trade as inquiries from that source are more numerous. A considerable tonnage on the upper docks is now being moved. Prices for Lake tonnage are very much mixed up and few contracts have been placed.

PITTSBURGH

There is nothing new in the union strike. Mines are all closed, one exception being the strip-mined coal on the Panhandle, which remains in the market with the usual production. There is no Westmoreland coal in the market, the district being closed by non-union strikes.

Connellsville coal has been continuously on the market since the strike started. While production in the general Connellsville region has been cut down by nearly two-thirds, the offerings have been of no small volume.

Prices at first rose rapidly as some large consumers were heavy buyers. A week ago these buyers began to curtail their purchases. One withdrew entirely and after a few days returned as a buyer of prompt deliveries at its own prices. As a result of the lessened demand rather than on account of there being increased production, the market has softened, and Connellsville steam coal is now quotable at $2.50@$2.75, and byproduct at $2.85@$3, with most transactions at $2.85.

Various reports that the Connellsville strikers are already weakening, and will very soon begin returning to work in large numbers, should be accepted with much reserve. The striking has not spread in the past week, but most of the men are likely to stay out for quite a while. There will be no strenuous action or drastic policy on the part of the operators in meeting the strike, and no strike breakers, evictions, etc. The strikes will be allowed to die out as they are certain to do in time. The U. M. W. has never had a foothold in the Connellsville region and there has been no big strike there since 1894.

EASTERN OHIO

An outstanding feature of the situation is the announcement that two cargoes of Lake coal, being held at Lorain, are to be unloaded to meet a demand in that quarter from certain steel mills and railroads. Other steamers may likewise be divested of their cargoes.

However, barring isolated cases, an abundant quantity of storage fuel remains well distributed throughout this section. The general market is quiet; demand is at a standstill and inquiries are few. While it is true that the larger users are willing to place orders at attractive prices looking to augmentation of their stocks, yet there is no particular inquiry for that purpose.

Stripping mines continue to operate. Their production has been impeded somewhat during the week by rains, but the volume of output is between 15,000 and 40,000 tons per week.

Most of the Lake cargo coal is being shipped from eastern Kentucky and West Virginia to ports of Toledo and Sandusky, respectively. Accumulation of coal under load at Toledo terminals has resulted in temporary embargoes being placed by the B. & O. against coals from certain Kentucky mines.

It is difficult to crystallize spot prices into what might be considered a range of quotations because of the various grades from the different fields and on which this market has not heretofore been dependent. It may be said, however, that prices have stiffened.

Receipts of bituminous coal at Cleveland continue about 50 per cent. of normal requirements, total receipts for the week ended April 22 amounting to 715 cars, 583 cars to industry and 132 cars to retail yards.

BUFFALO

The coal trade refuses to be even sensational. From the fact that salesmen from mining centers are rather numerous it would appear that the output is rather in excess of the demand, but both are very small and promise to continue so. Consumers are just beginning to draw on their stock piles, so the strike has accomplished little as yet.

More non-union men have joined the strike than was expected, but on the other hand the wagon mines are opening fast. That class of coal cannot be produced cheaply as it could in ordinary rail mines at moderate wages.

So it is hard to say what will be the outcome. Some coal is coming in from West Virginia and Kentucky but it has to sell high on account of the heavy freight rate.

With some coal selling up to a dollar higher the bulk of what little is moving goes at about old prices: $2.60 for Youghiogheny gas lump, $2.50 for Pittsburgh and No. 8 steam lump, $2.25 for Alleghany Valley and other mine run and $2 for slack.

DETROIT

Some wholesalers and jobbers are inclined to ascribe a slight improvement in the demand to the efforts of steel companies to add to their stocks of coal. There is, however, not much change, as regards the general class of industrial consumers.

Among some of the jobbers criticism is heard of certain mine selling-agencies which are accused of reporting their inability to comply with agreements for shipping coal, which the jobbers say was purchased at prices slightly lower than are now obtainable.

Nearly all sizes of West Virginia and Kentucky coals are now being quoted $2.50@$2.75. Smokeless lump and egg is $2.75@$3, mine run, $2, and nut, pea and slack $1.75@$2.

NORTHERN PANHANDLE

Non-union mines continue to operate despite the efforts of the United Mine Workers to close them down and despite a good deal of intimidation on the part of the union. There are from twelve to fourteen mines in this district in operation and production is not far short of 50,000 tons a week. There is a brisker demand for mine run and prices are on a higher level.

Cincinnati Gateway

Asking Prices Boosted; Market Running Wild

Quotations Show Wide Range, Due to Curtailed Supply and Heavy Buying —Lake Buyers Active—Cars Scarce in Hazard and Bell Counties.

PRICES are spread over a wide range. Wholesalers and jobbers have been boosting asking prices and the market has been running wild. The shortened supply and heavy buying orders are responsible for this condition. Lake buyers have been so active that the L. & N. was forced to restrict the movement to Lake Erie ports for a few days. A car shortage has developed in Hazard and Bell counties. Kentucky producers are now selling most of their coal on a mine-run basis, ranging $2.75@$3.

Many mines are sold up for May but while production of free coal is increasing there is no tendency toward any price reduction. Smokeless values have been enhanced by the high-volatile activity.

CINCINNATI

There have been some large buying orders placed here. The Pennsylvania is credited with having purchased 1,200 cars of steam coal within the past week. The rush of Lake buyers has crippled the carrying capacity of the L. & N. and restrictions were placed upon shipments to Lake Erie ports the whole of the first part of the week. Companies in Logan, Thacker and Williamson fields have more free coal to offer, but it looks reasonable that this tonnage will be forced to the higher price level. Quite a number of mines are sold up for May which is another means toward the upward trend in price. Quotations are shown in the Weekly Review.

Smokeless business continues to better itself as a reflection of the activity in the high-volatile market. However, a greater curb is held on the price question. Screenings are now on the same basis as mine run with screened nut taking a 25c. premium over the two. There is also a price distinction drawn between the egg and the lump, the latter being 25c. higher in price on the ton.

While a few householders are taking in supplies this retail movement is only seasonal and normal. Smokeless lump is $7.50@$7.75, mine run is $6.50@$6.75, which is the same price for bituminous lump. The range on slack is now $5@$5.50.

HIGH-VOLATILE FIELDS

KANAWHA

Approximately 5 per cent of the mines are operating, despite the fact that this is a strongly organized field. Many miners are asking for an opportunity to work and when conditions warrant it producers believe that it will be possible to operate a great many more mines. There is a somewhat better market for steam and byproduct, the principal demand coming from the East.

LOGAN AND THACKER

All production records are being broken in the Logan field owing to the heavier demand. Nearly all mines are in operation and producing to capacity. More fuel is being shipped to Eastern markets although the bulk of the output is going to Western markets. Miners showing no inclination to cease work since earnings are on a larger scale than they were before wages were readjusted.

Production in the Williamson field is being maintained at more than 121,000 tons a week as against 82,000 tons for the corresponding period of 1921. The only source of loss so far is "no market" and that is affecting production to the extent of 30 per cent of capacity. Nearly all mines are in operation and shipping coal to Western markets.

NORTHEASTERN KENTUCKY

There was a further increase in production in the week ending April 22, as a result of a better demand. Unbilled loads held on sidings for a time have disappeared entirely. Not only is there a better general demand for steam and byproduct but the Lakes are also providing an outlet. Concerns dependent upon the Pennsylvania fields are securing some of the tonnage of this district. Prices have stiffened materially.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

There are evidences of a gradual return to normal conditions in the New River field although production is still much below the average observed before the strike. There were more mines in operation in the week ended April 22 and in the days immediately following than during the period ended April 15, five or six companies having resumed operations. There is a much better demand at Tide and in Inland East markets and prices are on a higher level.

In the Winding Gulf district there has been a reaction against the United Mine Workers. Production continues at about 23,000 tons a day or about 3,000 tons a day under normal. More men are at work and there is a better market with much more coal flowing to Tidewater and to Inland East markets.

POCAHONTAS AND TUG RIVER

At no time during the present year has productoin been on a larger scale in the Pocahontas region. The average daily output is not far short of 75,000 tons. Heavier production is due to a better market in the East and particularly at Tidewater. Prices are on a little higher level. The strike is not affecting mining conditions in this district.

Tug River production was not far short of 100,000 tons in the week ended April 22 under the stimulus of a better demand and with steel mills especially seeking more coal. No change has been observed in labor conditions, virtually all of the 59 mines in this region being in operation.

SOUTHEASTERN KENTUCKY

Demand for all grades improved considerably during the past week. Harlan and Pineville are filled with outside buyers and a great deal of bidding is going on. Prices have advanced to where best Harlan and Straight Creek mine run is in good demand at $2.50@$2.75. Production continues to lag, although it is better than at any time since the strike began. There are a great number of mines working without any agreement of any kind and in some of these camps the union charters have been surrendered.

A good deal of labor is drifting into the field from Alabama and Tennessee and some from the North. None of the mines that are now operating have lost any ground to the union, but on the other hand, report that men are gradually drifting back.

South

BIRMINGHAM

There is no change to be noted in market conditions. The trade is very quiet, inquiry light and new business of small volume. Industrial operations have not revived sufficiently to create an increased or more diversified demand than has existed for some time. There has been no inquiry as yet outside the territory regularly served by this district.

Domestic coal buying is slow and dealers are showing no disposition toward haste in making contracts for next winter's supply, although in the aggregate a fairly good tonnage has been contracted for in the high grades.

Steam prices have not changed. Quotations on domestic grades for May are as follows, per net ton mines:

Big Seam	$1.96@$2.10
Carbon Hill	2.20@ 2.45
Cahaba	2.95@ 3.45
Black Creek	2.75@ 2.95
Corona	2.45@ 2.70
Montevallo	3.70@ 3.95

Production is showing a decline on account of the falling off in the amount of railroad fuel being taken. The Louisville & Nashville has taken practically no coal in the last three weeks, while the Frisco, Southern and other lines are far below the quotas. Furnace companies are increasing production steadily, which will partially take care of the loss in output at commercial operations.

VIRGINIA

Production ranges from 60 to 70 per cent of potential capacity. In the Clinch Valley district served by the N. & W. about 145 cars a day are being produced. There is a heavier demand for mine run but not for domestic grades. Prices have stiffened on mine run to $2@$2.50. Some industries which have been deprived of their regular supply through a suspension of operations in other fields are seeking coal in this territory.

News From the Coal Fields

ALABAMA

The spur track of the Central of Georgia Ry. from McComb's Switch to the new Overton mines of the **Alabama Fuel & Iron Co.** has been completed and coal is now being transported over it. Sidetracks are also being constructed to the mine of the **County Coal Co.**, in the same vicinity.

Birmingham was chosen as the 1923 meeting place of the **Southeastern Coal Merchants' Association**, which recently adjourned its sessions in Atlanta. C. M Farrar, Augusta, Ga., was elected president.

ALASKA

Plans have been completed for the **Lake & Export Coal Corporation**, of West Virginia, to examine the Chicaloon Mine in Alaska with a view to leasing the property or entering into a working arrangement with the Government. The Navy Department is very anxious to have this property operated so as to insure an independent supply of Navy grade coal in the Pacific. Maj. Lewis Hornberger is en route to Alaska with a party of coal mining engineers to examine the property.

COLORADO

Coal mining may take on a decidedly bigger aspect if the Moffat tunnel measure, now considered by the Colorado legislature in extraordinary session, is passed, and the counties directly affected bonded to insure construction of the big bore through the Colorado Rockies. The tunnel, if approved, will not only save considerable mileage, but insure transportation facilities the year round for mining interests in Routt and Moffat counties.

ILLINOIS

J. B. Sanborn, of Chicago, addressed the Chicago Wholesale Coal Shippers' Association at a luncheon recently, urging the men of the trade to adopt better credit reporting methods by cooperative action. Colonel Sanborn publishes the Coal Dealers' Blue Book.

H. C. Perry, of Hillsboro, general manager of the Indiana & Illinois Coal & Coke Corporation, was in Chicago on company business recently.

The International Railway Fuel Association has announced an addition to the program of its convention to be held at Chicago, on May 22 to 25. F. G. Lister, mechanical engineer of the El Paso & Southwestern R.R. will read a paper on "The Effect of Circulation on Locomotive Boiler Efficiency."

J. N. McCabe, vice-president of the Gruschow-McCabe Coal Co., of Chicago, is now traveling the Eastern coal fields.

W. A. Brewerton, of the Chicago office of the Sangamon Coal Co., was in Springfield recently.

Two mines owned by the **Denk Bros. Coal & Coke Co.**, of St. Louis, probably worked their last day March 31, just before the strike started. Definite plans have been made by the company to abandon mine No. 1 at Collinsville, a new mine which has been opened up at Edwardsville only a few months ago, practically taking the place of this mine. Mine No. 2 of the company located at Troy, will probably be shut down and abandoned.

Jonah Flavel, general superintendent of two mines at Duquoin, owned by the Jewel Coal & Mining Co., of St. Louis, is taking advantage of the strike by taking a vacation and fishing trip.

The Soper Coal Co., which at one time operated several mines in Perry County, has filed notice of dissolution with the secretary of state. Mines at Cutler, Pinckneyville and other points were operated by this company until about 3 years ago, when they were sold to another company. Headquarters of the concern are located at Mt. Vernon.

The South Fulton Coal Co., Astoria, has been incorporated with capital of $200,000. The company will operate a nearby mine. The incorporators are John Long, James M. Curless and Howard L. Schaefer.

J. D. Zook, vice-president of the Nason Coal Co., **Garner Williams**, general superintendent, and **C. W. Smith**, chief engineer, have recently been in Virden inspecting the North Mine, owned by the Nason company. The company is now erecting a steel tipple to take the place of the old one which has been dismantled. The company will also improve the North Mine with substantial, permanent buildings and modern machinery above ground and with heavy steel rails, enlarged working space and other improvements at the bottom.

C. F. Gleason, superintendent of the Scott. Smith Coal Co. mine at Duquoin, has resigned his position with the company. His future plans are not known and his successor has not yet been named.

The Peabody Coal Co., has purchased the Cambria mine of the **Carterville & Big Muddy Coal Co.**, near Carterville.

The Bell Union Coal & Mining Co., with main office at Philadelphia, announces the opening of a sales office at 955 Old Colony Bldg., Chicago, in charge of Herbert A. Hatfield, formerly with the Astel Coal Co. and the Taylor Coal Co.

The O'Gara Coal Co. has announced that it will start the erection of a modern two-story office building in Harrisburg. The company controls a number of mines through Harrisburg. The former offices of the company at Harrisburg were destroyed in March by fire. The new building will cost between $40,000 and $50,000.

INDIANA

R J. Smith, manager of the **Deep Vein Coal Co.**, at Princeton, recently signed a petition before the city council of that place, asking the right to construct switches from the Southeastern R.R. tracks to a new mine location. The petition was granted. The new shaft, it is stated will be concreted down to the rock. It is planned to have the mine working by November 1.

Lawrence Lyons, director of Indiana state highways, and **George J. Nattkamper** of Terre Haute, were at Princeton, recently in consultation with directors of the Princeton Chamber of Commerce. It is understood that they propose to construct a traction line from Princeton to the coal fields east and southeast of that city. The plan is that the line would be a coal carrying road and that it would also operate miners' trains. No definite action was taken, the Chamber of Commerce directors and visitors going over the general situation.

KENTUCKY

The Calhoun interests, which operate the Frankfort Coal Elevator Co., mines near Beattyville, and a fleet of barges and towboats to handle river coal transportation, having recently secured lease on property at Louisville for a coal transfer station for rehandling from water to rail, have put in temporary equipment at that point, and secured a lease on property above the falls for a second terminal, planning another on the north side, for New Albany and Jeffersonville, Ind., handling. The Calhoun interests are behind the formation of the Inland Waterways Co., and their equipment will be the start of a promised large line of river equipment to be owned by the new million dollar company. This company has in its organization as directors, James P. Barnes, of the Louisville Railway Co., and Harry Reid, of the Interstate Public Service Co. This will mean considerable distribution at Louisville and into southern Indiana by interurban connection, and probably freight street car connection, from terminal to outlying plants and country yards. The interurbans may also whip the railroads into aiding the terminal idea, which heretofore they have fought.

Amended articles have been filed by the **Procter Coal Co.**, Williamsburg, reducing its capital stock from $300,000 to $200,000.

A visitor in the Harlan field during the latter part of April was **James O. Watson**, of Fairmont, who is interested in a large tract in that section.

What appears to be a new market for Kentucky coal was opened up through the coal strike, and brought about the first shipment of Hazard coal in New York State. The rate on coal from the Central Pennsylvania fields to Buffalo is $2.51 and with the Lake rate, rail, to Toledo at $2.11 and 8½c. handling charges plus a Lake rate of 32c. cargoes could be laid down in Buffalo at just ½c. higher than they could from the usual source of supply.

Some big things are in prospect on the Ohio River at Louisville, which will have considerable effect on the coal trade. The Louisville Gas & Electric Co. has chartered a subsidiary as the **Louisville Hydro-Electric Co.**, and plans to harness the falls of the Ohio River, under a plan whereby the Government is figuring on rebuilding higher wickets and dams. At present this company is a large consumer, owns a mine at Echols, and twenty-five steel cars for moving its fuel from the mines to Louisville, but for some time past has been buying coal on the open market, finding this plan cheaper than to produce its own coal under existing conditions.

The New Duane Coal Co. has been organized in the Hazard coal field by A. S. Petry and others, with $50,000 capital after purchasing the plant of the Duane Coal Co. on Lott's Creek, a new field in Perry County. The new company will take over the plant and make a number of improvements. The new work will entail an expenditure of several thousand dollars.

The **Virginia Coal & Coke Co.** has purchased a large tract of coal land in the Hazard coal field from the **Kentucky River Coal Corporation.**

MINNESOTA

A labor organization of Minneapolis has filed objection with President Harding against the appointment of **Judge John F. McGee**, of Minneapolis, to the position of federal judge, on the ground that as a member of the public safety commission of Minnesota, he was unjust and offensive to organized labor. He was equally offensive to the coal trade, when acting as fuel administrator, but its members have not attempted to prevent his appointment to the federal bench, if there should be any danger of that occurring.

MISSOURI

The heavy rains have formed a large lake on the mine property of the **Callaway County Coal Co.**, south of Fulton. This is a strip mine, and not only the coal but the stripping machinery is covered with water. About ten feet of the water can be withdrawn by dynamiting the sides of the embankment, but the remainder will have to be pumped out.

Litigation extending over a period of four years and involving $138,000 has just been settled by Judge Fred Lamb, of Salisbury, who directed a verdict in the case of **Martin & Hubbell Coal Co.**, of Kansas City vs. the **Ray County Coal Co.**, of Richmond, the decision being in favor of the latter firm. Suit was first brought against the Ray County company for alleged breach of contract for the delivery of the output of the Richmond mine, from May 1, 1916, to July 31, 1918.

NEW YORK

Aimed to be a business-developer, the **New York Central Lines** have issued and are distributing gratis to shippers the largest railroad reference book of its kind ever published. It contains the names of more than 60,000 individual concerns on their rails, classified by commodities, localities and railroad facilities. Commercial and kindred business organizations, with the names of their presidents and secretaries and number of members, as well as all banking institutions located on the New York Central system, are alphabetically listed. Requests for copies may be sent direct to the Publicity Department, New York Central Lines, Grand Central Terminal, New York.

General offices of the **Iron Products Corporation** and subsidiary concerns are now located at 41 E. 42 St., New York City. Among the companies affected by the move are: **The Central Foundry Co., Central Iron & Coal Co.**, and the **Chattanooga Iron & Coal Corporation.**

The Virginia Iron, Coal & Coke Co.'s report for the first three months of this year shows gross earnings of $65,620, as compared with $633,738 in the same period of 1921. Net loss after interest and taxes was $81,047, against a net income of $471,356 in the same period of 1921.

Peale, Peacock & Kerr announce the removal of their New York offices to No. 1 Broadway.

Pilling & Co. has moved to 2 Rector St., New York City.

The Roebling Coal Co., has moved to 90 West St., New York City, telephone, Rector 6158

J. W. Galloway of New York will again head the **Maryland Coal Co.**, a Maryland corporation, having been elected at the recent annual meeting of stockholders. The following board of directors was also re-elected: J. W. Galloway, New York; John T. Manson, of New Haven, Conn.; Gordon Smith of Baltimore, Md.; George Paull of Pittsburgh, Pa.; George Hewlett of New York; Nathan Todd Porter, Jr. of New York, and J. E. McGowan of New York.

OHIO

Exceptions have been filed by attorneys with the common pleas court against the payment of any coal awards in the contested cases of coal purchased by the state under methods which were held to be illegal. At that time State Treasurer Tracy was named as master commissioner to investigate the question of payment on coal contracts which were held illegal but upon which coal deliveries had been made. He has recommended the payment of $77,000 which is a reduction of more than $20,000 in the original recommendations. The attorneys representing M. E. Thrailkill, who brought the original suit, object to payment of any sum.

The Southern Ohio Coal Exchange reports about a dozen stripping operations in Jefferson and Harrison counties going with a production of about 450 cars or 9,000 tons weekly.

Bids will be opened May 22 by the Board of Education of Columbus for approximately 10,000 tons of 1¼-in. lump coal, for the various school buildings. The coal is to be delivered during the summer months.

Judge John Weld Peck in Cincinnati has allowed the **Houston Coal Co.** the right to appeal the suit against the Government to recover damages for coal that was seized by the Navy and on which the company claimed the difference between the amount allowed and the market price of the coal at the time of the seizure. Judge Peck had dismissed the suit on the claim that in accepting the full allowance the company had concluded the transaction. About $314,000 is involved.

Lake Bobbit, of Charleston, who was in Cincinnati recently stated that it was the intention of Vice-President Quin Morton to oversee the local office of the **Ft. Dearborn Coal Co.**, for the time being and that he would put in his time between Chicago and Cincinnati. Mr Bobbit was on his way to Chicago where he was to supervise certain of the company's affairs there.

Damages of $100,000 were caused when after a night of pouring rain the **Brettell Coal Co.'s** tipple between Steubenville and Mingo Junction was swept 200 ft. from its position on a hillside, to the railroad tracks below, along the Ohio River. Four automobile trucks, a touring car, and a large retaining wall, were swept along by the tipple, which dumped its two hundred tons of coal on the tracks.

The defendants in the complaint filed by the **Ohio Mining Co.**, and 22 other coal mining companies in the Hocking Valley against the Hocking Power Co., the Athens Electric Co., and the Southern Ohio Power Co., alleging high and unreasonable rates for electric current, have filed a motion to dismiss on the grounds that they are not public utilities. This question is now being considered by the commission and briefs have been filed by both sides. Until this question is decided the matter of the reasonableness of the rates will not be taken up.

PENNSYLVANIA

Contracts have been let by the **Monarch Fuel Co.**, of Latrobe, for the erection of [illegible] houses to be built at Rural Ridge, Allegheny County, work to be started shortly. The group of houses is to be built in connection with the Monarch company's new mine development east of Russeltown, and will comprise the first unit of a modern mining village that the coal company will ultimately develop

The home of Thomas Kelly, employed as an electrician at the **Garfield-Smokeless Coal Co.**, was blown up recently. Simultaneously the electrical equipment of his employers' workings at Garfield were wrecked by persons still unknown. The company employs non-union workmen, but some of the men there have joined the ranks of strikers, union leaders said.

Among the companies recently incorporated are the following: **International Anthracite Mines, Inc.**, Scranton, capital stock, $15,000. Incorporators: E. E. Wright, West Toronto, Can.; Lovell G. Mickels, Montreal, Can., and Ralph W. Rymer, Scranton. **Poquea Coal Co.**, Philadelphia, $50,000. Incorporators: Frederick Shoff, Lancaster; William J. Faux and Archer C. Tunis, Philadelphia. **The Harley-Hankinson Co.**, Clarion, $30,000. J. E. Wolfe, Clarion, is treasurer. Incorporators. J. D. Hankinson, Utica, N. Y.; Richard Robbins, Summerville, and C. F. Heath, Franklin.

The N. J. Fyock Coal Mining Co., of Windber, has been incorporated. The capital stock is $200,000.

The Beckman Coal Mining Co. has been incorporated under Delaware laws. Headquarters will be at Ransaytown; capital, $75,000.

The Co-operative Department of Mining Engineering of Carnegie Institute of Technology, Pittsburgh, announces the offer of **two fellowships in mining research and two in teaching and research**, in co-operation with the Pittsburgh Experiment Station of the United States Bureau of Mines. Fellowships are open to the graduates of universities and technical schools who are properly qualified to undertake research investigations. The value of each fellowship is $750 per year of ten months beginning July 1st for the position of Research Fellow and August 1st for Teaching Fellow.

A State charter has been granted to the People's Fuel & Supply Co., of Red Lion. It will mine coal and manufacture coal products. Its capital stock is $100,000 and its incorporators are Benjamin S. Sents, Samuel A. Roseman and Samuel C. Craley, Red Lion. Notice has been filed by G. C. Woodward, treasurer, Philadelphia, of an increase in the indebtedness of the company from nothing to $200,000.

The McGregor Coal Co. has notified the State Department at Harrisburg that it has increased its capital stock from $75,000 to $110,000. Perry L. Wingert is president and the company operates in Jefferson County.

The Keystone Fuel Corporation, Pittsburgh, has been chartered with capital stock of $25,000; treasurer, Charles H. Anthony, Pittsburgh. Incorporators, J. B. Nicklas, Jr, J. H. McClure, and H. E. Maser, Pittsburgh.

The Pennsylvania Supreme Court has confirmed the findings of Judge Henry, of Lebanon County, in releasing for the use of the **Thomas Colliery Co.**, approximately 450,000 tons of coal under the borough of Shenandoah The Home Brewing Co. is declared to have no right to an injunction restricting the mining of coal, but this is no bar to any action for recovery of damages which might arise from such mining. This is the finish of a case which has long interested Schuylkill County. It was originally brought against the Thomas company, and the original injunction was granted by Judge Marr in November, 1904, the brewing company alleging a menace to its plant.

Appeals have been taken by the **Lehigh Valley Coal Co.** from the assessment on certain coal lands made by the Scranton authorities, the company having applied to the mayor and city councilmen, sitting as a board of revision, for a reduction in the valuation. Re-survey of the coal lands of the city is to get under way at once.

VIRGINIA

B. T. Griffin, member of the firm of Griffin Brothers, was elected president of the Norfolk Retail Coal Dealers' Association at its annual meeting. **Oscar Ferebee** of Nottingham & Wrenn, was chosen vice-president, and **C. O. Santos**, of Johns Brothers, secretary and treasurer.

Nottingham & Wrenn were recently awarded a verdict of $50,000 against the Norfolk & Western for alleged overcharges in shipments of coal, and for alleged diversions of coal supplies from the company's shipments. The suit has been pending for many months.

WEST VIRGINIA

The St. George Coal Co. has been launched by Elmer C. St. George of Charleston and his associates, this company planning to operate near Julian, which will be the general headquarters of the new concern. The company is capitalized at $25,000. Associated with Mr. St. George in the new enterprise are: F. C. Fenimore, of St. Albans; Paul Fesko, Steve Gyoval, of Julian and George Novak of Van.

Officials of the **Cleveland & Morgantown Coal Co.**, with headquarters at Cleveland, spent the second week of April inspecting the properties of this company in Monongalia County. During the week the four mines of the company, company houses and other property was inspected.

Bluefield business men have formed the **Pocahontas Red Ash Coal Corporation**, which will operate in McDowell County on a small scale, having its headquarters at Iaeger. This company has a capitalization of $50,000. Principally interested in this corporation are: J. G. Magowan, Thomas A. Weeks, Patsy Small, Iaeger; J. R. Cameron and J. T. Breth, of Bluefield.

J. B. Shumate, formerly of Bluefield, will head the newly organized **Pocahontas-Kanawha Coal Co.**, which will have its principal offices at Dayton, Ohio. This company expects not only to engage in the production of coal in the Pocahontas, New River and Kentucky fields but also to deal in coal.

Logan coal men have launched the **McRoss Smokeless Coal Co.**, which with a capitalization of $75,000 will operate on a fairly large scale. The general offices of the company are to be at Logan. Having an active part in organizing this company were: J. J. Ross, of the Logan Mining Co., H. A. McCallister, H. N. Clendenning, W. C. Devault and E. M. Jefferys, all of Logan.

Men formerly prominently identified with the Morgantown Coal Co., have organized what will be known as the **Taylor Fuel Co.**, the headquarters of which will be in Morgantown. Marvin L. Taylor has become the head of the new concern and will have as his associates Harry C. Owen and O. W. Rider, both of whom were connected with the Morgantown Company prior to the formation of the new concern. Mr. Taylor was for several years the vice-president of the Morgantown company and is a director of the American Wholesale Coal Association and of the Pittsburgh Wholesale Coal Association.

Development on a large scale of approximately 8,000 acres of smokeless coal land in the Glade Creek section of the New River field is presaged by the purchase on the part of this company of the acreage mentioned. This land was owned by J. T. Lightner and others. It is understood that the purchase price was not far from $600,000 and that Cumberland coal people are largely interested in the **Eastern Coal & Mining Co.**, which made the purchase. Estimates of the coal contained in the 8,000 acres are as high as 90,000,000 tons, this coal being in three different seams. It is proposed to construct a railroad from the C. & O. at the mouth of Glade Creek to the field it is desired to develop.

Eviction of miners employed by the **Rosedale Coal Co.**, has been ordered by Justice Posten of Monongalia County after a hearing held on April 21, the company served notice on its employees prior to April 1 that if they ceased work, possession of the houses would be demanded for those who were willing to work, the leases under which the houses were occupied containing a clause to the effect that the lease should be terminated whenever the rent was not paid in advance.

Deaths in the mining industry of West Virginia reached a total of thirty-two during the month of March, seventeen of the fatalities being due to falls of coal, slate and timber. Three deaths followed mine car accidents and four men were killed in motor accidents. Two miners were electrocuted, two were killed in premature explosions, one man was killed in a mining machine accident and three died from various causes outside the mines.

WISCONSIN

Several Milwaukee coal firms are contemplating making improvements at their dock yards during the period of the coal strike. **The Milwaukee-Western Fuel Co.** will construct a new anthracite shed and coal hoist at the Canal St. yard at a total cost of something like $200,000. The same company will build a new hoist at its yard at the foot of 18th St. to cost about $18,000.

A coal miner at Green Bay recently discovered a stick of dynamite in a block of soft coal which he was breaking up to put in his furnace. It was a fortunate find for him and his neighbors.

Talk is rife among coal men at the Head-of-the-Lakes that several coal docks at Superior, will undergo extensive repairs during the period of the strike. No definite announcement as to the companies involved has been made as yet, but extensive improvements are surely on the books.

The Pittsburgh-Ashland Coal & Dock Co., located at Ashland, has let a contract for a concrete face for its dock. Peppard & Fulton of Superior, Wis., will do the work. The contract price is $20,000. Work will be completed this summer.

NOVA SCOTIA

The Dominion Coal Co., Nova Scotia Steel & Coal Co., and Acadia Coal Co., have announced that they have named **John E. Moore**, of St. Johns, N. B., as their representative upon a board of conciliation established by the Minister of Labor in connection with coal miners' wages in Nova Scotia.

ONTARIO

The Dominion Coal & Wood Co., Ltd., has been organized in Toronto and has been granted an Ontario charter with power to carry on business and to take over the business of a former company. The capital stock is $40,000 and the provisional directors are K. F. MacKenzie, G. S. Saunerson, A. I. Shortt, H. F. Cline and A. Wells, Toronto.

Magistrate Jones has committed Hiram F. Slater and Leslie J. Thompson for trial on a joint charge of the theft of $400,000 belonging to the **Nukel Fuel Co.**, and conspiracy. This was the final preliminary hearing, and during the taking of evidence, the Crown presented letters written by Thompson, who is the son-in-law of Slater, and a stock salesman, to the Trusts & Guarantee Co. who acted as agents for the Nukol company, instructing them to issue and transfer stock to parties named to the amount of many thousands of dollars. One letter ordered the issue of 10,000 shares to the Financial Underwriters, Ltd., with which Slater was connected. Other exhibits showing transfers of stock from Slater were produced. Bail was given in $43,000 for Slater and $15,000 for Thompson.

The Penn-Canadian Fuel Co., which has had its general offices in the C. P. R. Bldg., Toronto has removed to the York Bldg. **The Scott Coal Co.** will also move to the same building the **F. P. Weaver Coal Co.** has removed from the Royal Bank Bldg. to 38 King St., W.

WASHINGTON, D. C.

Director H. Foster Bain, of the Bureau of Mines, left Washington April 20 on a trip of inspection in Alaska during which he will witness tests of coal from the Chickaloon and Bering River fields to determine their fitness for Navy use. En route he will visit the experiment stations of the Bureau at Urbana, Denver, San Francisco and Seattle.

M. R. Campbell is acting as administrative geologist of the U. S. Geological Survey during the absence of **Philip S. Smith** from Washington.

F. L. Hess, of the U. S. Geological Survey, is in the field gathering data for the Division of Mineral Resources

H. G. Ferguson and S. H. Cathcart are en route to Nevada to do geologic work in the Tonopah quadrangle for the U. S. Geological Survey.

W. B. Smith, of the U. S. Geological Survey, is working on an oil and gas map of Virginia.

The erection of a magnificent building, costing $1,300,000, as the home of the **National Academy of Sciences and the National Research Council**, will shortly be begun on the square bounded by B and C Sts., 21st and 22d Sts., Washington. The building will serve as a center for American science in its various fields. The building is the gift of the **Carnegie Corporation of New York**, while the ground was bought at a cost of about $200,000 through the donations of a score of benefactors.

The Arkansas Anthracite Coal & Land Co., has appealed to the Supreme Court for review of the decision of the Circuit Court of Appeals, Eight Circuit, which awarded judgment of $14,649 to **Fremont Stokes** for royalties on lands leased by him to the company.

The United States Civil Service Commission announces an open competitive examination for junior engineer. Applications will be received until June 1. Vacancies in the Water Resources Branch of the Geological Survey at entrance salaries ranging from $1,440 to $1,740 a year, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. In addition to the salaries above indicated, employees will be allowed expenses when on field duty.

It is reported in Washington that **Joseph P. Tumulty**, of New Jersey, formerly secretary to President Wilson, and **Raymond T. Baker**, of Nevada, formerly Director of the Mint, are forming a corporation to manufacture a processed coal under the Trent process at the old plant of the Virginia Shipbuilding Corporation at Alexandria. Mr. Tumulty will be vice-president and attorney for the firm, which it is reported, has leased the old shipbuilding plant on the Potomac.

Traffic News

An I. C. C. examiner has recommended dismissal of the complaint of the **Wayne Coal Co.**, which alleged that it had been discriminated against and the mines of the Pittsburgh Terminal Railroad & Coal Co. preferred in the matter of car supply from October, 1917, to March, 1918.

In the complaint of the **Salkeld Coal Co.**, an examiner recommends that rates on bituminous coal from Walford, Pa., to Warren, Ohio, in 1920 were not unreasonable.

In the complaint of **Henry W. Somers**, an examiner recommends that rates on steam sizes of anthracite from points in the Wyoming, Pa., field, to Mechanicsville, N. Y., and points taking the same rates were unreasonable.

Deciding the complaint of the **Dayton Malleable Iron Co.**, an examiner recommends that rates on coal from Ward, W. Va., to Ironton, Ohio, were unreasonable.

The Colorado & Southern Railway Co. has applied to the I. C. C. for authority to issue certificates to acquire one thousand gondola coal cars.

In the complaint of the **Riverside Coal Co.**, the I. C. C. decides that the rates on bituminous coal from mines on the Ohio & Kentucky Ry. near O. and K. Junction, Ky., to Cincinnati and points in Central and Western territories are unreasonable. It prescribes that, effective June 16, the rates shall not exceed those maintained to the same destinations from O. and K. Junction and points taking the same rates on the main line and on branch lines or spur connections of the L. & N. from O. and K. Junction south to and including Hombre, Ky.

In the complaint of **W. L. Carney**, of Chicago, traffic manager for the **Grogan Coal Co.**, the commission decides that two carloads of anthracite shipped from Dunmore, Pa., to Chicago were misrouted but denies reparation for lack of proof.

The I. C. C. has authorized the **Colorado & Southern Ry.** to issue securities amounting to $1,425,000 to procure 1,000 gondola coal cars.

In the complaint of the **Opp Coal Co.**, the commission decides that the rates on intrastate shipments of bituminous coal during Federal control from various Indiana mines to Aurora and Frankton, Ind., were unreasonable.

Various railroads have asked authority of the commission to establish rates on coal from Arkansas, Oklahoma, Kansas and Missouri mines to Omaha, St. Joseph and Atchison, Kan., without observing the provisions of the 4th section of the commerce act. The applications will be heard before an examiner at Kansas City, May 9.

The complaint of the **U. S. Coal & Coke Co.**, has been assigned for hearing at Louisville, May 11.

The application of the N. & W. Ry. to continue to charge for coal from Caples, Excelsior, Pageton, Springton and Susanna, W. Va., to Loveland, Ohio, rates lower than those to Blanchester, Leesburg and Lynchburg, Ohio, will be heard at Cincinnati May 15.

Obituary

G. A. Hickok, fuel purchasing agent for the Missouri-Kansas & Texas Ry., was found dead in his room at the New Jefferson Hotel in Jefferson, Tex., late in April. Mr. Hickok had been fuel purchasing agent for the "Katy" for a number of years and was well known to all the coal operators of Texas and Oklahoma.

Association Activities

Northern West Virginia Coal Operators' Association

In addition to considering matters affecting the coal industry in Northern West Virginia and developments growing out of the strike, directors of the association, at a meeting held in Fairmont on April 24, elected three new directors of the association. They were Frank Miller, Consumers Fuel Co., Broomfield; Stephen Arkwright, of the Arkwright Coal Co., Fairmont; J. G. Binnis, Uniontown, of the Buckhannon River Coal Co. They were elected to fill the vacancies caused by the resignation of Samuel D. Brady, Robert Grant and J. W. Devison, when the Monongahela Coal Association was organized and started.

Coming Meetings

National Retail Coal Merchants' Association. Fifth annual convention at the Drake Hotel, Chicago, Ill., May 18-20. Executive secretary, Joseph E. O'Toole, South Penn Square, Philadelphia, Pa.

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

Missouri Retail Coal Merchants Association will hold its annual meeting May 16 and 17 at the Planters Hotel, St. Louis, Mo. Secretary, F. A. Parker, Arcade Bldg., St. Louis, Mo.

National Coal Association will hold its annual meeting at Congress Hotel, Chicago, May 24 to 25. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham

The American Wholesale Coal Association will hold its annual convention at Detroit, June 6. Secretary, G. H. Merryweather, Union Fuel Bldg., Chicago, Ill.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 26.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 18-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St. New York City.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at Trenton, N. J., June 7 and 8.

Retail Coal Dealers' Association of Texas. Seventeenth annual convention at Greenville, Tex., May 15 and 16. Banquets on both nights will be tendered the association, that on Wednesday night being given by the Greenville Chamber of Commerce and on Thursday by the Wholesale Coal Men. Secretary, C. R. Goldman, Dallas.

American Society of Mechanical Engineers. The spring meeting will be held at Atlanta, Ga., May 8-11. Preliminary events will be held at Charlottesville, Va., May 5 and 6, in cooperation with the Virginia section of the A. S. M. E. Immediately following the Atlanta meeting observation tours will be made to points in the South, including Birmingham, Greenville, S. C., Muscle Shoals and Pensacola, Fla. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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A Real Labor Trust

WHAT an opportunity the United Mine Workers and Mr. Bland have overlooked. What they as partisan pleaders for the union miner seek is better conditions for the miner; more days work at high wages that he may have much greater annual earnings. They have sensed and admitted that there are too many workers in the mines. They can see that were it possible to reduce the number to about two-thirds of the present, then the remainder would be more steadily engaged in digging coal and most certainly would have handsome incomes at the scale of wages in the last contract.

If the union will but extend to other states the laws with respect to the employment of miners now in effect in the hard coal regions of Pennsylvania and to all of Illinois they will have the opportunity to really control the situation. The laws of Pennsylvania require that before a man can become a miner in the anthracite mines he must have served an apprenticeship as assistant to a miner. Thus it is impossible to increase the number of diggers—the real getters of coal—except by the slow process of bringing them up through the ranks. This has prevented the possibility of an oversupply of labor in that part of the coal fields.

Similar laws in Illinois require that no man shall be employed as a miner who has not a certificate from the state. These certificates must be granted by a board every member of which has served at least five years as a miner, one year in the State of Illinois. In other words, the United Mine Workers absolutely control in that state the issuance of certificates of competency to every miner. If they so desired they could limit the number; could cut down the oversupply of men. If the number of miners were thus limited by the union, the operators would automatically reduce the number of day pay men to correspond.

There is nothing new or original in this suggestion. It is a practice followed by the unions in the building trades. In certain sections of the country the masons' union, for instance, requires that a boss mason—that is, an employer—must employ a certain minimum number of masons—11 in one case that has come to our attention—before he is permitted to engage an apprentice or helper. The purpose is obvious. A continual labor shortage is produced. And where there is a shortage of labor, wages are easily kept at high levels. Those that are on the union rolls in good standing are assured of the best working time the industry affords.

If the United Mine Workers will but thus get control of the mine labor, by limiting its membership, overcapacity if not overdevelopment will be reduced. That is, if instead of asking for six hours a day and five days a week for 600,000 men, they demand and obtain eight hours a day for six days a week for 450,000 men they will have a large part of what they are now demanding.

Of course such a program might meet opposition from the operators who prefer to employ non-union labor and the public may not be quite ready to hand such a basic industry as coal over to the union.

Wanted—A Plan

THERE is unanimity among the editorial writers of the daily press and the critics of the coal industry that something is wrong; that what is needed is something different. But so far all they have been able to espouse is a demand for facts and yet more facts. No plan has been brought forth.

The miners say, and with considerable truth, that with a third more men in the business of digging coal than are actually required, there is not enough pay in it to support them the year around, especially if they are organized and refuse to reduce wages and share with non-union miners in the going business. They demand more or the same high rate of wages that they enjoyed in their last contract, shorter hours, and several changes in working conditions that will increase the cost of production of coal and help them to live as well or better. The miners' union seeks not to mitigate in any respect its hold on the coal industry, but rather to extend that hold. So that whoever brings forth a plan must reckon with satisfying or defying the demands and aspirations of the United Mine Workers. The plan must either put wages even higher or coldly squeeze out a third of the workers.

The operators ask to be left alone, saying that under the highly competitive conditions of the bituminous coal trade, the public is protected against extortionate prices. The operator wants to make a profit, and we have heard no critic say that he is not entitled to a profit; nay, we have heard no one say but that he is entitled to at least a profit of 10 per cent. And surely there are some among the self-appointed judgment givers who will give credence to those figures on profits that are available, a part of which are from government sources and therefore not under the shadow of suspicion. The figures on profits, from those assembled by the Fuel Administration, the Federal Trade Commission, the Internal Revenue Bureau and the Bureau of the Census, to those compiled by the operators themselves, all unite in showing profits on the average to be within reason. So we find that the plan that is finally to come forth must make provision for profits on the capital invested in the production of coal. If the plan is to satisfy the operators it must be so designed as to permit the expression of individual enterprise and not reduce all to a dead level.

The public wants someone to come forward with a plan to "reorganize" the coal industry. The public judges the coal industry by the price of coal and its knowledge of the price of coal is found on the invoice from the retail dealer. Not only is the public conception of the price of coal founded on mine price plus freight plus retailers' margins but it is true that the public of the East has shown much more interest in the subject than has the public in the West. In other words, it is the price of hard coal delivered at the curb that is the real subject of popular discussion. Furthermore, the public is critical of an industry, both the capital and the labor in it, that is in turmoil so frequently, so vociferously and on so large a scale. Since the miners and the operators engage in a national fracas and call on the public for judgment and support, they may expect to get some sort of judgment. The plan, to satisfy the public, must therefore take this large question out of the public forum for all future time and must leave the public satisfied with the price of its coal.

There is yet another element that must be reckoned into the plan. The non-union coal fields are not bound by the wage findings of the union areas except in a general way. Yet again the situation in anthracite is so different from that in the bituminous coal fields that the same scheme will not cover both.

It is reported that the President and his advisers are working on such a plan. We are given to understand that they are not even suggesting a set of terms for settlement of the present strike situation, but that they are looking ahead and seek a remedy so basic that no future controversy can arise. We believe that, given sufficient time, they will come to some conclusion—that the government at Washington, working quietly and outside the domain of Congressional committee hearing rooms, can and will secure all the data that it requires. From such a source we have every expectation for reasoned conclusion, not partisan protest such as has just flowed from the House Labor Committee.

But we feel that when all is said and done there will still be the necessity for a plan. The administration will find no panacea for the ills of the bituminous coal industry. The most that can be expected is a clear statement of the problems, some good advice for the public, the miner and the operators and suggestions for gradual elimination of trouble if the advice is followed.

An Experiment to Watch

TO PLACE the industry on a high plane of integrity and efficiency and to correlate the efforts toward betterment made by existing organizations, through a conference association representative of the whole industry and dedicated to the improvement of the service which the industry renders to communities, states and the nation, is the purpose of a new organization in the construction industry, the American Construction Council.

All branches of the industry are represented in the new body—architects, engineers, general contractors, sub-contractors, construction labor, material and equipment manufacturers and dealers, financial, bond, and real estate interests, public utility construction departments and the government. Here we have in one group for the first time perhaps all interests involved in a single industry.

Herbert Hoover, who is to be the first chairman of the Council, in accepting the responsibility, emphasized the need for such an all-embracing organization and suggested that had it been in existence previously it could have saved that industry much in the way of public confidence by dissemination of unbiased facts.

Here are some of the items on the program—a code of ethics, a national building code, research and statistical bureau, lengthening of the building season, elimination of waste, standardization, development of apprenticeship systems and encouragement of local study and better understanding of building situations. To show the country that the baseball and movie worlds are not alone in recognizing talent, they have engaged Franklin D. Roosevelt, formerly Assistant Secretary of the Navy, for president.

Is there not the germ of an idea for the coal industry in this development? It is hard to conceive of interests more diverse than coal operators, jobbers, retailers, mine workers, engineers, equipment manufacturers and financiers, yet we doubt not that the organizers of this new Council found harmony as difficult in the construction industry.

A Needed Stimulus

AN ENGINEER who had spent years in the metal mines of the West recently remarked upon the notable lack of young college men about the coal mines. To use his expression, "One can hardly go in a metal mine without bouncing a rock off the head of at least two embryo mining engineers," but he could travel for days and never find one in the coal mines.

Coal-mining camps are not less inviting than metal-mining towns; a shovelful of coal is no heavier than one of quartz; engineering and management problems are no less interesting and intriguing in coal than in hard rock mines; the opportunities in an industry as extensive as coal should not be less but greater than in the more restricted related industry, yet it is true that coal mining is singularly lacking in that sort of engineering talent that gives youthful life and vigor to metal mining.

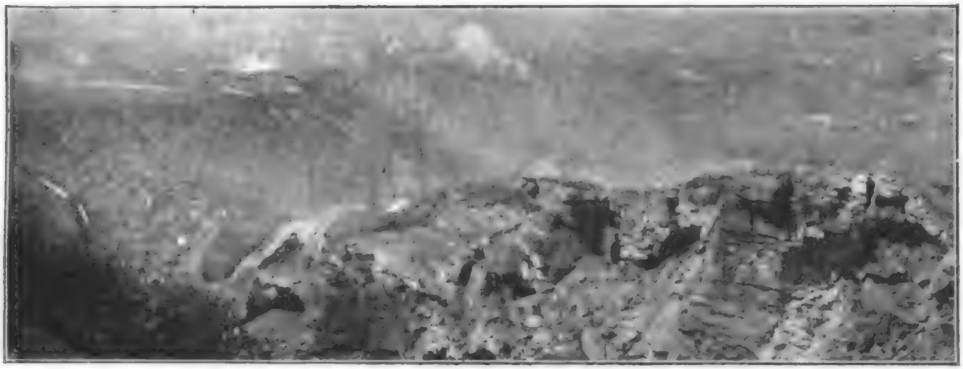
Consider for a moment the process through which progress in such an enterprise is attained. The workers at the face, the drivers of mine locomotives—the workers who do the tasks of producing coal—are the ones best suited to locate, isolate and capitalize the opportunities for mechanical and managerial improvement. Who can better tell how to improve the mining machine, the mechanical loader, the mine layout, than the worker in the mine?

If that worker is an untrained laborer there will be no suggestion. If that worker is trained as mining schools train mechanical, electrical and mining engineers, then suggestions, ideas, plans and progress will result. Practice is better than theory for testing out ideas, and the trained man who spends his working hours with a machine will finally overcome every obstacle in the way of adapting the machine to do all the work.

It is our creed that efficiency in the mining of coal is measured in terms of the substitution of mechanical for manual processes. Many operators are slow to recognize this; the miners' union opposes it.

JOHN L. LEWIS, president of the miners' union, with Secretary of Labor Davis visited the White House on Thursday, May 4, 1922, and discussed the coal situation with the President.

STILL NEUTRAL.—Two courses are open to the striking coal miner, but he sternly refuses to take his pick.—*James J. Montague, in the New York Tribune.*



HUNDREDS OF ACRES ARE ALREADY SUBJECT TO THE GREAT AND RAPIDLY SPREADING RED ASH FIRE

Red Ash Co.'s Mine Fire, Thought to Be Slushed Out, Blazes Up, Threatening Near-by Properties

Fire Travels Six Feet per Day in One Direction and Four Feet in Another—Stripping to Stop Fire Stopped by Union—Fire for Five Years Believed to Be Dead

By D. C. Ashmead*
Kingston, Pa.

NOTHING in the anthracite region has proved more destructive of property than the mine fire. In this field the coal deposits are numerous and overlie each other, the intervals separating adjacent beds being comparatively small. Where one or more of these measures has been mined out, the rock between them not infrequently caves, permitting leakage of air from one bed to the other. Thus is the fire aided in its extension.

Various methods of procedure have from time to time been devised to cope with such fires. Unfortunately, however, means successfully employed in one instance may fail in another, even under apparently similar conditions.

One of the most dangerous fires now burning in the anthracite region is in an operation of the Red Ash Coal Co., near Wilkes-Barre, held under lease from the Lehigh & Wilkes-Barre Coal Co. This property embraces a strip of land about 2,600 ft. wide and 7,400 ft. long, lying along the mountainside at the outcrop and containing two beds of coal. Of these two, the Red Ash is the lower. In this locality this bed is split by a 6-ft. parting into the upper Red Ash bed, which is 6 ft. thick, and the lower Red Ash bed, with a thickness of 4 ft. Above and separated from the upper Red Ash bed by 27 ft. of slate lies the Ross coal bed, which here is about 9 ft. thick. Over the Ross bed is 47 ft. of black and 68 ft. of gray stone. The black material is a coarse and probably highly carboniferous slate.

At the time the fire started first mining had been completed in the area to the south and east of the breaker and some of the pillars had been removed. In consequence, many cracks and caves had extended not only from bed to bed but up to the surface.

On the afternoon of Saturday, Dec. 6, 1915, a loaded mine car jumped the track in a room neck near the point marked *X* on the accompanying map. The men employed in that vicinity placed this car back on the rails and then went home. On the following Monday fire was discovered at approximately the point where the car had been derailed. It is presumed that one of the men who assisted in replacing the mine car hung his lamp on one of the mine timbers and then forgot it. Only the previous week the company had laid off the night watchman who patrolled the mine looking for fires, as his services were deemed unnecessary.

Immediate steps were taken to combat the fire. Concrete stoppings were placed in all openings in that sec-

FIRE BURNING ON OUTCROPS OF COAL

Taken at the point marked *B* on the map. Near the point where the man is standing is an opening from an old breast which now acts as an intake. Here the air enters the mine with a roar.

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*Anthracite editor, *Coal Age*.

A Burning Strip-Pit Face

Taken at the point marked A on the accompanying map of the Red Ash Mine. The white patches represent ashes. The coal is not burning at this point, but the rock above and below it is already on fire. Experience shows that the fire travels faster in the stray coal stringers running through the roof than in the coal itself. The fire has not been stopped by this old stripping, over which it spread between Nov. 1, 1921, and April 1, 1922. In fact the fire ran over it with great ease.

tion of the mine, the idea being to seal the fire within a limited area. Next, boreholes were drilled from the surface and the sealed area was flushed. In all, thirty-two boreholes were sunk. The approximate location of these holes is shown on the map and the area within the stoppings just mentioned is indicated by hatching. It was believed that this would extinguish the fire, and for a period of five years no more was seen or heard of it. In consequence everyone believed that it had been effectually smothered and that all danger was past.

Early in 1921, however, the fire broke through its barriers and began moving toward the outcrop in a southerly direction, as shown by the dot-and-dash lines in the map. Simultaneously it broke through to the eastward and by April 1, 1921, had spread over the area indicated, covering about 20 acres. During the next six months it spread to the southwest and by Nov. 1, 1921, had covered an additional 38.78 acres, as indicated on the map. It had thus advanced at the rate of 200 ft. per month to its limits as they existed at that time. Its progress in the direction of the Baltimore No. 5 colliery of the Hudson Coal Co. had been only 750 ft., which is a speed of 120 ft. per month, or about 30 ft. per week.

At this time the fire was about 3,400 ft. from the eastern boundary of the property. Had it kept on going at a uniform rate, it would have reached the boundary line in about 100 weeks. During the next four months, however, the fire advanced in the same direction about 800 ft., or at a rate of nearly 50 ft. per week. Thus on April 1, 1922, it was only 2,600 ft. from the Hudson Coal Co.'s line.

During this latter period of four months, however, the fire had crept to the outcrop on the south and east and the total area affected amounted to 188.2 acres. Its exact boundaries on the northwest are impossible to determine, as none of the workings can be entered. It is not unreasonable to suppose, however, that the fire now covers the area indicated upon the map.

On the north side of the property a barrier pillar separates the Red Ash Coal Co.'s workings from the Lehigh & Wilkes-Barre Coal Co.'s old Empire mine, which now forms part of the Stanton colliery. The western portion of the Red Ash Coal Co.'s operations are free from water, as they are higher than the water-level tunnel in the No. 2 mine, and as these two operations are connected the water naturally drains out.

In consequence, the only protection left to the Lehigh & Wilkes-Barre Coal Co. is the barrier pillar between the properties. This is continuously inspected to see that the fire does not penetrate it. Fires have been known to pierce such barrier pillars even when they are entirely solid, and it is obvious, therefore, that the Empire workings are in danger.

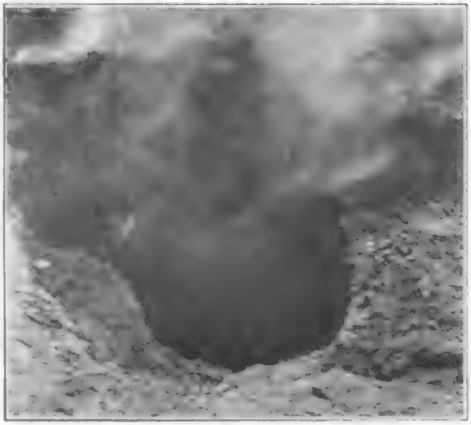
The fire cannot spread on the northeast side of the property, as the coal in this region lies below drainage level and all spaces are thus full of water. At present, however, there is nothing to prevent it from spreading throughout those workings that lie above this elevation. Should this occur, it would endanger the workings of the Baltimore No. 5 colliery of the Hudson Coal Co. As the fire is traveling more rapidly in this direction than in any other, this company has been forced to take measures to prevent it from proceeding further.

At the mouth of the No. 1 slope, shown on the map, the Red Ash Coal Co. has stripped the surface intending to remove the coal at this point. Application has been made to the United Mine Workers of America to obtain permission for the hiring of 260 men, employees of the Red Ash Coal Co., to remove this coal during the present strike and therefore reduce the danger of the fire spreading along the outcrop in this direction.

During the month of February, Seward E. Button, chief of the State Mining Department, called a meeting of representatives of all the companies whose mines are threatened by this fire. At this meeting the necessity of checking the spread of this fire was emphasized. At a second meeting E. R. Pettebone, consulting engineer of the Hudson Coal Co., presented two plans for coping with it. The first was to dig a ditch near the

ONE OF THE POINTS WHERE STEAM ESCAPES

This is shown at *D* on the map. The steam down in the hole is entirely uncondensed and therefore transparent. For this reason it is possible to see way down into the cave.



ANOTHER VIEW OF THE SAME FUMAROLE

The steam condenses as soon as it reaches the surface. Holes like these will be filled up, as they enable the fire to draw on its intakes and often reverse, thus themselves becoming intakes.

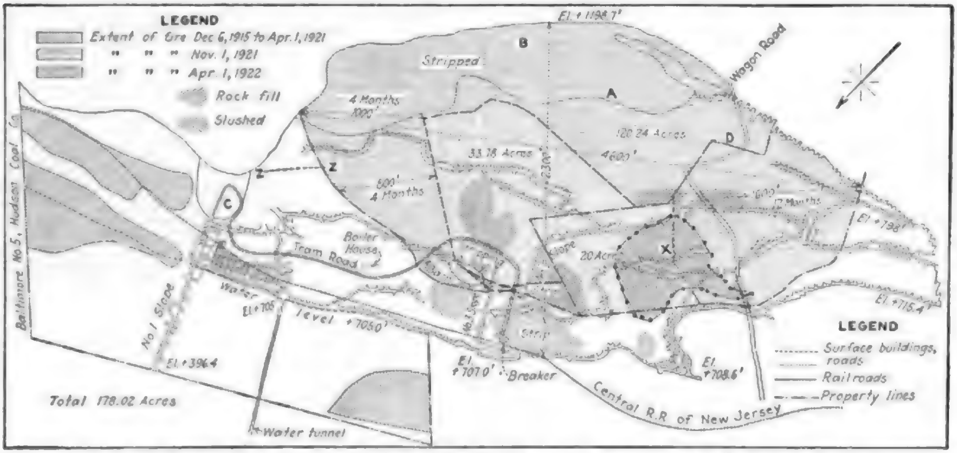
extreme eastern end of the property adjacent to the Hudson Coal Co. line. This was to extend down to water level in the mine. This trench would be about 100 ft. wide at the bottom and its lowest point would be 180 ft. below the surface. It would be approximately 800 ft. long. Stripping contractors from various parts of the country inspected the work and estimated that it would cost approximately $1,000,000. This was deemed too expensive to attempt.

The second plan was then adopted as being feasible, and work upon it is now being prosecuted. This is as follows: Coal from the stripping at the mouth of No. 1 slope will be removed first. Then a timber gangway will be built from the No. 1 slope to the entrance of the water tunnel, 12-in. timbers being used for the legs and 16-in. for the cap pieces. The timber will be so centered that new sets may be placed between the old ones as they decay. Lagging 3 in. thick will be placed outside these timbers. Slush will then be run in outside the lagging and all of the void space above the timbers and at the sides will be filled with this material. In some places the roof as far up as the Ross bed has fallen, this being here a distance of about 40 ft.

Light brattices are being placed in all the openings on the west side of the No. 1 slope. At the present time these are not being made airtight, as it is thought that blackdamp might collect behind them and endanger the lives of the men working in the slope and tunnel. Until this tunnel is finished, a door will be maintained

Entrance to No. 1 Slope

This is the point at which the fire is being fought. It is marked on the map by the letter *C*. Note will be taken of the stripping at the mouth of the slope. This is the strip pit the working of which the United Mine Workers of America has been asked to permit on the ground that to discontinue work would, like the failure of the pumps and fans, jeopardize the life of the properties on which mine workers' own future livelihood rests.



MAP SHOWING THE RAPID AND MENACING ADVANCE OF THE FIRE FROM ITS INITIAL POINT, X

An open lamp which a man hung on a timber by its hook while replacing a wrecked mine car is believed to have caused this accident. Many fires probably have been started in just that way, and it is a real indictment of the open lamp and of combustible timber that they can start fires which may cost millions to extinguish, doing damage meantime that may destroy property of an equal or greater value.

across it, reducing the amount of air that can reach the fire from this direction. A light brattice also has been placed in the water tunnel, reducing the quantity of air that can feed the fire from this passage.

It is estimated that 35,000 cu.ft. of air per minute is entering the workings from these two sources. If this air can be prevented from reaching the fire, the intensity with which it burns will be lessened. The fire has been able to advance against its known air supply at the rate of over 30 ft. per week. The amount of air that it has received from behind through the numerous caves and cracks to the surface has been sufficient to carry it against the air that it was receiving from the front.

The second step in this plan is to fill in behind the stoppings with slush. This will be forced tight against the roof and will fill all the openings in the several beds. Just below the water level on the No. 1 slope, brattices will be placed and slush forced in behind them. Below the water-level gangway, which is actually a little above water level, a large cave has taken place. It is the intention to fill this in order to support the roof so that no cracks will occur at this point, bringing air in from the surface.

Having shut off the air supply from the fire in this manner, a number of boreholes will be sunk in the area southeast of the point where the water-level gangway and No. 1 slope join. As much slush as possible will be run into these holes to act as a further air seal and to support the roof. All openings and cracks in the outcrop of the Ross bed, which runs southeast along the line *ZZ* shown on the map, will be filled. It is expected that this will effectually stop the fire, first, by cutting off all air feeding it from the mine; second, by forming a pocket within which blackdamp will collect, and, third, by filling all openings, thus cutting off the draft from the surface.

Just what effect the procedure above outlined will have upon the fire itself is, of course, unknown. The direction of its travel may be reversed by shutting off the air from a certain quarter, and it may move some other way. It is hoped, however, that the expedients above described will prevent the fire from endangering the neighboring properties. This is the chief purpose, that of extinguishing the fire being only secondary.

Some interesting sights may be seen in the present fire area. At one point it would appear that the gray sandstone rock was burning, as it is unquestionably, at a white heat. This may, however, be caused by fire in the slate and coal below it. In many places immediately adjacent to points where the coal has been stripped the rock both above and below the coal is burning, though the coal itself is not. One may stand near some of the cracks and caves to the surface and see the air currents reverse themselves from time to time. At other points the air enters the openings with a roaring noise. On a clear, cool day great clouds of steam rise from the fire area and to an observer at a distance it appears as if the whole mountainside were burning.

Another peculiar circumstance attending this fire is that when the atmospheric temperature is below 65 deg. F. the fire apparently travels toward the outcrop. At about 65 deg. the fire seems to be at a standstill, but when the temperature rises above this point, it moves down into the mine.

IN CO-OPERATION WITH a shipyard where oxygen gas used for cutting and welding is distributed under pressure through a long system of pipes, tests have been made by the Bureau of Mines to determine the feasibility of using a stench for detecting and eliminating leakage of the expensive oxygen. It was recommended that a stench such as thyl mercaptan, amyl acetate, or phenyl isocyanide be applied in the distributing line at a pressure of 30 lb., as greater danger of ignition or explosion exists if application is made in the high-pressure line at the compressors. Application of stenches to fuel gases has been studied by the bureau with especial reference to stenches for detecting leakage of blue water gas and natural gas. In experimental tests on stench warning systems recently installed on compressed-air lines at various metal mines, the warnings have been distributed among distant workings in 2½ to 10 minutes, but no occasion has occurred thus far for using a stench for a necessary warning.

Strip-Pit Economics as Developed at Shoveltown Mine

By Alphonse F. Brosky*
Pittsburgh, Pa.

Coal Is Being Uncovered Ahead of Demand and Left for a Better Market—Boiler-Feed Pipes Lined and Leveled with Transit to Avoid Trouble from Frost—Haulage and Shooting Methods

DEPRESSION in the coal market is inevitably mirrored in mine output. At times when competition is keen, only mines operated at low cost can continue to operate. High-cost developments shut down, but resume activities quickly when demand increases. Doubtless it would prove a boon to all concerned if, through storage or otherwise, mining activity could be made more nearly uniform without excessive cost. The storage of bituminous coal as ordinarily effected involves not only an added expense but grave danger from spontaneous combustion.

Strippable coal areas of large extent offer a safe means of storing an appreciable quantity of fuel ready for quick shipment. The "carrying charge" on coal thus made available for market is comparatively small and the risk from spontaneous firing slight.

On the headwaters of Bear Run, four miles southwest of Osceola Mills, Pa., the Stine Coal Co., a subsidiary of the Gorman-Leonard Coal Co., of Worcester, Mass., has 433 acres of coal, approximately 250 of which are now being stripped. This operation is locally known as the Shoveltown mine. The large stripping shovel at this plant is kept in continuous operation, regardless of market conditions, so that it will be ready to load out the stripped coal as rapidly as possible as soon as the market is favorable. During the past year or more, while the demand for coal has been light, the stripping shovel has uncovered approximately 300,000 tons of coal. This is ready to be loaded and shipped when market conditions warrant.

Cover of Coal Nowhere Exceeds Forty Feet

The map shows the topographical and structural conditions that combine so fortunately to make this tract suitable for stripping. The key horizon taken is 1392.3 ft. A.T., as established by the U. S. Geological Survey. In consequence the true elevation of any point shown on this map may be found by adding the figure stated to the height shown. Because the coal bed nearly follows the contour of the surface, the greatest depth of overburden is 40 ft. and the average depth of cover does not exceed 20 or 25 ft. The overburden consists of shale, clay and sandstone. On an average section the coal is overlaid by 10 ft. of shale and about 10 ft. of thinly laminated sandstone, the whole being covered with clay and alluvium.

The formation lying above the coal at different points, however, has marked variations. At the present time the stripping shovel is at work on the eastern extremity of the crop line. Here the contact above the coal is sandstone, whereas in most cases to the west it is a loose shale. Where the thickness of overburden exceeds 25 ft. a formation of clay and shale is found above the sandstone. The clay is loose and easily shoveled, and the rocks break into pieces of such size that they readily may be handled. The tendency of the clay to swell upon weathering does not introduce any serious obstacle to operation at this depth, as ample space is available for spoiling.

Coal Mined Varies Greatly in Thickness

The exact identity of the coal bed being worked has not been definitely established. It is generally accepted as a merging of the *C*, or upper Kittanning, and the *C'*, or lower Kittanning. At two distinct points in the southwest portion of the pit the coal pinches out over small areas, to thicken compensatingly at other places. The character of the coal may best be defined by stating that it lies on the side of the first, or Moshannon, basin.

Over most of the area the coal has an average thickness of 60 in. In pockets, however, it thickens to as much as 9 ft., with corresponding adjacent thin areas of 2 to 3 ft. The stratum immediately overlying the coal bed is, in the main, loose shale, which makes stripping easy but would make mining by underground methods exceptionally difficult, for only by close timbering could the roof be supported. Small quantities of mother coal are found throughout the bed, and an intermittent streak of slate is found approximately 2 ft. from the bottom, which is a fireclay from 9 to 14 ft. thick. The upper portion of the bed is composed of 4 to 6 in. of bone.

Before any real development was done on the Shoveltown property it was thoroughly prospected. A number of test shafts were put down at intervals near the outcrop, and about fifty diamond-drill holes were sunk all over the deeper portion of the tract. From the data and information thus collected the structural map shown herewith was laid out. The precautions thus taken cost little in comparison to what may be lost should the coal fail in a property that has not been tested. In an area where the coal is not level, but has dips and basins, a structural map proves almost as invalu-

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*Bituminous editor, *Coal Age*.

Train of Cars

Two-ton mine cars in twenty-five car trips are used at this stripping. The side board is hinged and collapses inward if hit by the shovel.

able as the steam shovels themselves, for without it the deposit cannot be worked with economy and efficiency.

With such a map an operator can forecast the difficulties he will encounter throughout the life of the property, can decide upon the most economical method of working, keeping in mind the problems of drainage, track grades, etc. The drill records show how much coal the tract contains, gives a correct idea of its nature, and also determines the depth of overburden throughout the entire area. A method of attack which will require only slight changes throughout the life of the operation may then be planned, even before a single shovel arrives on the job. With such preliminary precautions, failure, if it results, can be attributed only to carelessness or mismanagement.

To strip the Shoveltown property a 340-ton shovel with an 80-ft. boom and 6-cu.yd. dipper is used. The coal is loaded out by two smaller shovels, one weighing 36 tons and the other 28 tons, the dippers being of 1 cu.yd. capacity. To facilitate drainage the tract will be worked in two sections, the stripping shovel cutting across the neck on the eastern side of the property, thus separating the head extension from the main body. This neck cut is indicated by *CD* in the map.

Starting at *A* in the northwest portion of the property, the stripping shovel followed the crop line in a counterclockwise direction southward to *F*. Here it "boxed in" and retraced its course northward to *A*, where it again turned back, returning to *F*. It then proceeded eastward toward *C*, and will circle the property, spiraling inward.

SHOVEL STAYS BY WATER SUPPLY IN WINTER

The need for water was the occasion of the redoubling cuts on the western end of the property. The boiler-feed supply was drawn from springs in the neighborhood of *A*, and as the work was prosecuted during the winter it was advantageous for the shovel to remain as close as possible to the source of this supply. When the shovel doubles back and forth along the side of a property more men are required to keep the track clean and the coal trains and the shovel interfere with each other.

After the third cut along the western boundary the shovel proceeded from *F* to *C* on the neck. Here it cut across to *D* and followed around the crop line to *E*, which is its present approximate position. Thence it will advance to *C*, at which point it will again cut across the neck and proceed north and west to the starting point at *A*.

In cutting across the neck from *C* to *D* the stripping shovel trenched in as narrowly as possible, because the spoil resulting from this cut must be handled again and in addition the cover upon which it was placed will have to be removed.

Because of the large acreage, two loading shovels may be operated without interfering with each other. Thus far the stripper has been practically in continuous operation, whereas the loading shovels have not. As a result, approximately 300,000 tons of coal are now in reserve for the loaders. Even if these machines worked on triple shifts it would take some months for them to catch up with the stripper. By reason of the shallow cover over the greater portion of the property the stripping machine will be able to maintain a cut 70 to 85 ft. in width. This, of course, may be narrowed down to 50 or 60 ft. for short distances where the cover attains a thickness of 40 ft. or thereabout.

TRACK IS FIRST PLACED IN CENTER OF CUT

In keeping with ordinary stripping practice the pit track rests upon the coal bank. During the first loading cut this track is laid in the middle of the cut, and on the succeeding cut it is shoved over toward the solid. The two loading shovels reciprocate, working first toward, then away from, each other. They do not pass, each having its own section to load. By piling the shallow cover high in the spoil bank an open space is left between the bank and the coal bench. This does not close in materially between successive cuts.

Shotholes are put down in the overburden by means of a 5-in. churn drill. So far, it has been necessary to make only one row of holes, but as the stripping progresses it probably will be advantageous to use at least two. These holes are put down to within approximately 8 ft. of the coal, sprung with dynamite and then charged with from 250 to 400 lb. of black powder. In the coal the shotholes are put down with two pneumatic hand drills. These holes are spaced at 10-ft. intervals, and staggered.

As has been mentioned, the roof of the coal measure consists of 4 to 6 in. of bone. The stripper bares this capping, but does not remove it. This acts as a cover for the coal proper, keeping out both water and air, which, upon long standing of the coal, might cause more or less disintegration. Before the coal is loaded the clean-up gang removes this impurity. In the loading-out operation, furthermore, approximately 1 in. of coal is left in the bottom. This is carefully cleaned and shoveled toward the face between trips, thus exposing the bottom proper and aiding the shovel operator.

In a coal stripping the water problem is second only to that of shovel operation. This problem includes both boiler supply and pit drainage. Of the two the former is perhaps the more important and causes the more trouble and worry. The flooding of a portion of the pit may halt operations temporarily, but some means always is available whereby the water may be removed. The supplying of feed water to the boilers often is a much more difficult problem. Even though the supply be reliable and unfailing, trouble may arise during freezing weather.

Maintaining smoldering fires along the pipe line is not an entirely satisfactory way of preventing the freezing of pipes, and the usual practice is to blow out the water line with steam from the boiler of the steam shovel. A crooked line with depressions here and there may make this method unsuccessful. Such dips act as traps in which the water collects and freezes, giving much trouble. Even if the ice plug be successfully blown out with steam the pipe may be found to have burst as a result of the expansion in freezing.

TRANSIT USED TO LINE AND GRADE WATER PIPES

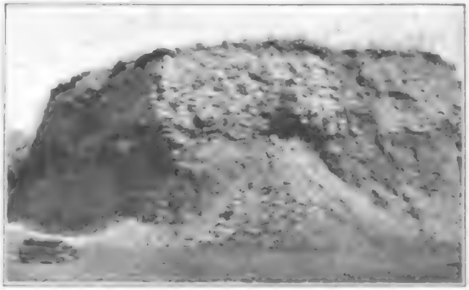
At the Shoveltown stripping not only are the water pipes blown out with steam but they are kept in proper alignment and to grade by means of a transit. These lines also are made as short as possible. The water supply for this operation is dependable, being drawn from two sources. Near the point *A* on the map are three springs, the water from which is pumped direct to the boilers. A reserve supply of 25,000 gallons is maintained in a reservoir tank near this source. For a short time in the winter the springs freeze and cease to flow and in the summer they are likely to dry up.

The supply from the springs is augmented by water pumped to the storage tank from Bear Run. A small steam pump delivers water from the tank to the shovels in the pit or to another tank located at the western end of the property at the point of greatest elevation. This latter tank supplies the town with wash water.

The property lies in two watersheds, both sloping toward the north with the dip of the measures. The water from the main coal body flows into a stream near *A*, and that from the eastern section drains off toward *G*. This drainage is practically natural, so that little pumping is necessary. In the vicinity of *F* a roll in the coal causes the accumulation of approximately 5 ft. of water. When this occurs a 1,000-gallon centrifugal pump held in readiness for such occasions is put to work. This is driven through gears by a 10 x 12-in. steam engine, and is mounted on what is practically a mine-car truck, the flanges having been removed from the wheels. Consequently it may be hauled by a team anywhere on the coal bench.

A tramway 13,000 ft. long extends from the strip pit to the railroad tipple, which is located to the northwest. The grade favors the loads throughout the entire distance, and because the drainage is excellent a good roadbed easily may be maintained. Thirty-pound rails are used within the pit and 60-lb. rails on the main haulage road. The gage is 36 in.

Light rails can be used in the pit because the track is carried on the coal bench, insuring fairly uniform grades and a solid footing and because the coal is transported in a specially-built 2-ton mine car which when loaded in most instances is dropped down the steep grades by gravity. In consequence light rails can be used without difficulty for the pit track. As yet no coal has been loaded from the area east of the neck. Here the grades will be steep and for the most part against the loads, therefore at this point heavier track may be necessary. At the present with the light demand for coal a single 16-ton steam locomotive hauls all the coal, another locomotive of equal size being held in reserve.



SECTION OF SOUTHWESTERN KNOB OF STRIPPING

The cover reaches at this point a maximum thickness of approximately 40 ft. It may be compared with the cross-section shown in the illustration accompanying the title of the article. There the sandstone immediately covers the coal. In this illustration a loose shale is shown between the sandstone and the boney by which latter the coal is covered.

Coal is being loaded out from the southern portion of the main body, the loaded cars being dropped down the grade parallel to the western outcrop. These cars are gradually brought to standstill in the length of the straight track above the point *A*. Here they are made up into trips of from 25 to 30 cars and lowered to the railroad. The number of cars composing a trip is limited by the drawbar pull of the locomotive on the steeper grades of the return journey, in which, of course, only empties are hauled. As loading proceeds from, say, *F* toward *C*, the reserve locomotive may have to be employed. Furthermore, after a cut is made across *AB*, and the track laid, this locomotive will afford means for removing the coal from the eastern section and the eastern portion of the main body.

A turnout is placed on the main haulage road near the approach to the tipple. Here the locomotive sidetracks and the cars are allowed to move onto the tipple by gravity, passing on the way over a bridge, under which is laid the empty track, which is in reality a turnout. After being dumped, the cars move by gravity down under this bridge, where they are coupled into trips.

EACH LOCOMOTIVE CAN HAUL 400 TONS A DAY

When a locomotive arrives at the tipple with a loaded trip a string of empties is waiting, ready for the return. It takes about 45 minutes to make a round trip from the stripping to the tipple and back to the pit, so that one locomotive may haul at the rate of 500 to 600 tons of coal per 8-hr. day. In actual practice, however, incidental delays reduce these figures to about 400 tons.

When the demand for coal increases, two or possibly even three locomotives may be employed on the main haulage, and each of these should be able to accomplish approximately as much as the single locomotive is now doing. Inasmuch as a large reserve of coal has already been uncovered, an output of 2,400 tons per shift might be maintained for several months.

The success of this haulage system in the presence of steep grades and long travel to the tipple is attributed to the use of mine cars in coal transportation. The cars are standard underground mine wagons, except for slight modifications in the construction of the upper sideboard. The lower boards are 8 in. high, the flare boards are 12 in. wide, and the upper sideboards are 24 in. high over all, but are made up in two sections.

The lower section adjacent to the flare board is rigid and is 16 in. wide. Above this is placed an 8-in. board which is hinged to the 16-in. section and collapses inward.

Experience has shown the wisdom of this construction. Shovel operators do not always take time to raise the bucket high enough to avoid grazing the sideboard, which in this manner often is split or broken. With the arrangement above described, if the dipper does not swing altogether too low, all that happens is that the upper sideboard falls inward, but as it may be raised to its normal position again by hand, no harm is done and there is no delay. The car is of composite construction and equipped with plain-bearing wheels.

In flat beds of coal the contractors' side-dump car may be successfully used. Even in such beds, however, it possesses certain disadvantages and mechanical deficiencies. Up until last year, side-dump cars were in use at Shoveltown, and they caused endless worry and delay. Track grades within the pit are in places as steep as 10 per cent, and those along the main haulage roads also are excessive. It is difficult, and in most cases dangerous, to apply brakes to the standard contractors' car.

Furthermore, the great weight of this car, together with that of the locomotive, causes a concentration of load on a short length of track. In carrying an equal tonnage a trip of mine cars would occupy a length of track twice that which a contractors' car would need. The high center of gravity of the contractors' car is the cause of many derailments. Side sway is another of the bad effects of a high center of gravity. It has a tendency to loosen the spikes in the ties, and a poor track results. In dumping on the tipple also the cars must be spotted and tipped, much time being thus lost.

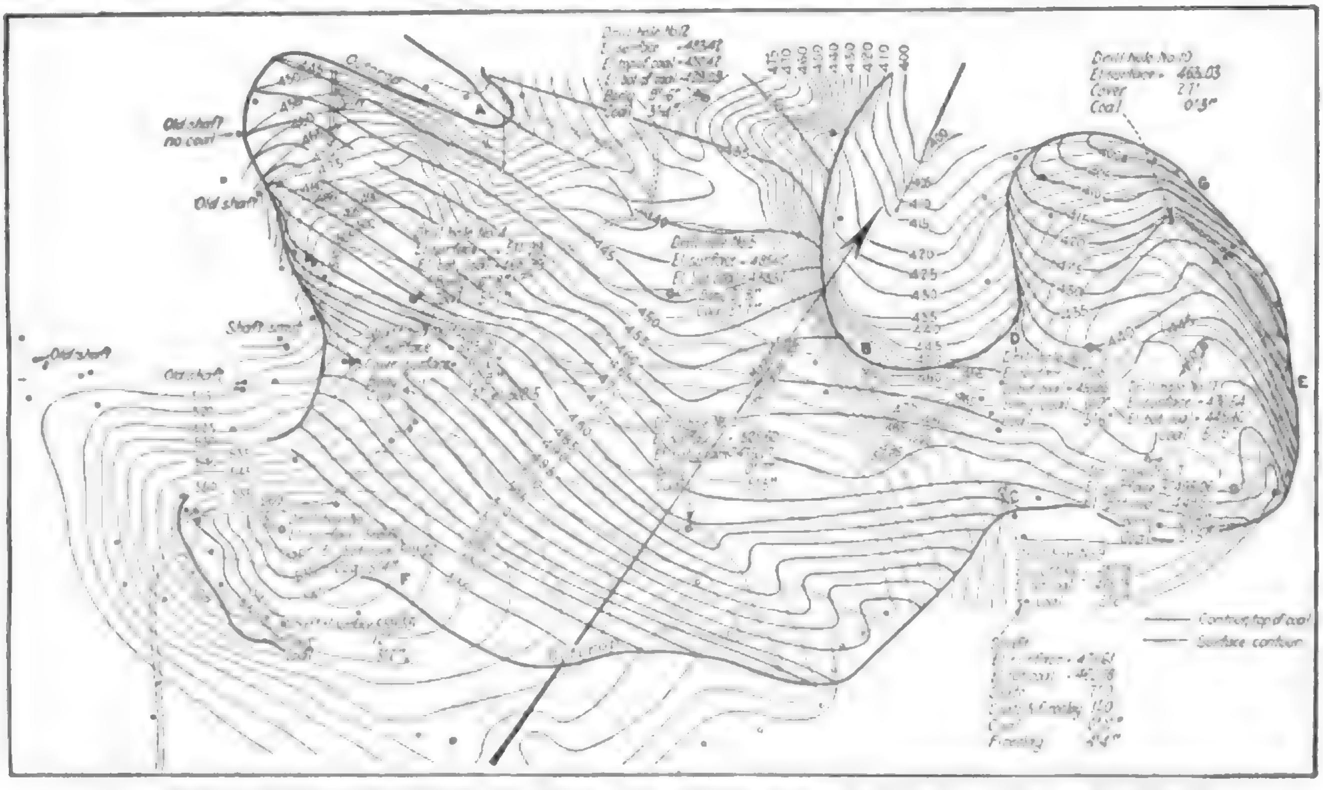
Since mine cars have been used two locomotives haul as much coal as five did when the large contractors' car was employed, and the work is done at an appreciably lower cost, although this may appear unbelievable.

At the Shoveltown pit trips no longer are pushed by a locomotive over any great distance, for this practice was believed to have caused many mine-car drawbars to fail. Since its discontinuance drawbars are less frequently bent or broken. The practice now followed invariably is to make the locomotive lead the train. In going down grades brakes are set on the cars at intervals, and all drawbars are thus placed in tension.

At the present time thirty-three men are employed on this stripping. Of this number, fifteen belong to the labor gang and are engaged in laying new track. This number, however, varies from time to time, being usually less than that stated above, but never more. Nine men are employed on the stripping shovel, four are on the machine itself, four lay track and build cribbing and one digs coal for fuel. The loading shovels are each manned by an engineer and fireman.

In addition to these there are one engineer and one brakeman for each locomotive, one labor foreman and one coal inspector who oversees the cleaning of the product preparatory to loading. With any marked increase in the quantity of coal loaded per shift—say with an output of 2,000 tons—the number of men necessary would not greatly exceed forty, the increase being in train crews.

I wish to acknowledge my indebtedness to S. B. Stine, president of the Stine Coal Co., and to David H. Wilkison, acting field executive at the stripping, who kindly granted me every possible courtesy in looking over the property above described, and also furnished valuable information.



MAP SHOWING CONTOUR LINES OF COAL AND SURFACE, ALSO THE DRILLHOLES AND SHAFTS, AT SHOVELTOWN STRIPPING

Subterranean mining can be conducted with some satisfaction with only a crop line and a mine survey. Strippings, on the other hand, have to be contoured on the surface and on the coal top. To obtain the coal contours is an expensive operation and where the coal probably is level is sometimes omitted. Nevertheless the omission of this detail may spell failure to the enterprise should an unexpected dip occur and make the mining unduly expensive or impracticable. In this case the coal pitched down heavily, but the ground had a general dipping trend in the same direction.

Safety Gates at Cresson Slowly Opened by Rack and Pinion Electrically Operated

CRESSON NO. 9 mine of the Pennsylvania Coal & Coke Corporation, near Cresson, Pa., works two seams of coal, the Lower Freeport and the Lower Kittanning. The cage landing at the Lower Freeport is provided with steam-operated safety gates. At the surface landing, however, the gates which were installed in 1919 are operated by electricity. Though an innovation in this respect they give satisfactory service.

When they were first installed they were equipped with a sprocket and gear, but after a few days the chain links stretched so that they no longer meshed. In consequence, a rack and pinion were provided in place of the gear and sprocket.

The composite gates are of oak with ½ x 2-in. steel-strap hangers, and weigh 250 lb. each. The over-all dimensions are 7 x 8 ft. Between the straps of each hanger is pinned a spool roller which rides upon a 4-in. I-beam. This member is made up of two lengths which join opposite the middle leg of the headframe by bolting to a T-bracket which is anchored to the leg. The beams are hinged from V-shaped brackets secured to the end legs of the headframe. With this arrangement either or both beams with the attached gate or gates may be swung out, thus permitting long rails or timbers to be loaded into the cages.

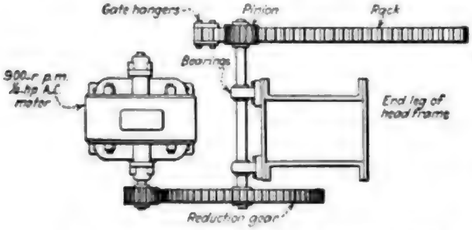


FIG. 1. MECHANISM FOR OPENING SAFETY GATE

A large reduction gear reduces the speed imparted by a ¾-hp. alternating-current motor, which causes a pinion to move a rack at relatively low speed, thus opening the gates of the shaft. The pinion can be slid free of the rack when gate hangers have to be thrown open to admit large material to the shaft.

Gate Will Open Wide in Six Seconds

The drive pinions are secured by means of setscrews, so that they may be slid inward from the rack of the gate drive when loading clearance is desired. The racks are supported on the top of the gate hangers. A plan of the gate drive is shown in Fig. 1. The shaft of the drive pinion rests in two bearings which are fastened to a leg of the headframe. On the opposite end of the shaft is located a reduction gear which meshes with a pinion on the motor shaft. The gate will open in 6 seconds. The motor speed is 900 r.p.m., so that it takes 90 revolutions of the motor to open the gate. The gear reduction is such that a ¾-hp. three-phase motor is sufficiently powerful for the purpose. The motors and the rack and pinions are sheltered by wood housings.

As the gates are used only when men or material need to be hoisted or lowered, the electric circuit usually is left open. Otherwise, each time a cage passes the surface landing on its way to the dumping point, a reversing switch would be thrown, which would momentarily start one of the motors. The period during which the current is closed, however, would be so short that the gate would not be moved.

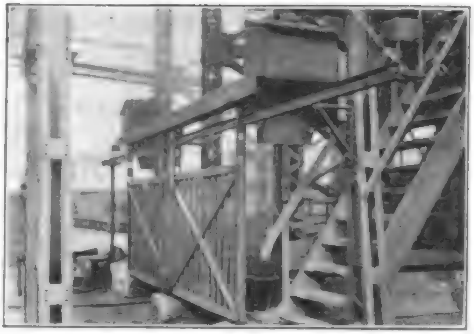


FIG. 2. SHAFT GATES AT SURFACE LANDING

The electrical parts by which the gate is operated are boxed in the two shed-like housings on either side of the shaft. The gates open in about six seconds.

Still, any difficulty of this kind that might be experienced is avoided by the insertion of two single-pole switches on the hoist platform. When the operator gets a bell for a surface landing, he closes the switches, which are conveniently located at arm's length from him. Indicator lamps within view of the operator tell him at all times whether the gates are open or closed. A schematic diagram of the wiring is shown in Fig. 3. The gates were designed by J. F. MacWilliams, who is electrical engineer of the corporation.

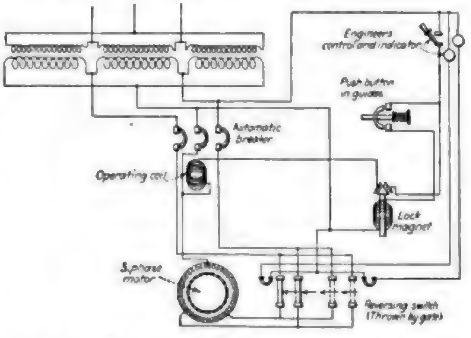


FIG. 3. DIAGRAM OF ELECTRICAL CONTROL FOR GATE

The electric circuit usually is left open, so that when the cage is taken past the landing point to the dump the gates will not start to open. By two single-pole switches on the hoist platform, which are closed by the hoist engineer when a landing at the surface is desired, the electric circuit is closed.

Almost a Thousand Employees of the Davis Coal & Coke Co. in West Virginia recently were given mine-rescue and first-aid training by the crew of U. S. Bureau of Mines Car No. 8. In addition, 111 previously-trained employees took the training. Classes were trained at Dartmoor, Benbush, Pierce, Davis, Coketon, Thomas, Kempton and Henry. Every official of the company at the towns named now holds a Bureau of Mines certificate, and 65.5 per cent of the employees are first-aid men.

Reports and Investigations State Geological Surveys and Mining Bureaus

Coal Reserves in Westmoreland County, Pa.

WESTMORELAND COUNTY, PA., has six coal beds that are now of economic interest. In order of present importance these are the Pittsburgh, Upper Freeport, Redstone, Lower Kittanning, Middle Kittanning and Waynesburg.

The great development of the Pittsburgh bed and numerous exposures of its outcrop have furnished many reliable measurements of its thickness, thus making possible an accurate and reliable computation of the quantity of coal contained in this deposit. No information is available as to the size of mined-out areas in some localities. For these places an estimate of probable depletion has been made, based on age and size of operation or on the difference between original areas and statements of areas remaining unmined.

The Upper Freeport bed contains the greatest reserve within the county. The extensive development of this coal along the Kiskiminitas and Allegheny rivers, the outcrop throughout the county, and drillhole records have furnished a fair number of detailed measurements of its thickness. From data available a fairly accurate map of this bed has been made showing the extent of the thick Freeport coal, the large faulted area in the central and western part of the county and the local faults along the Kiskiminitas River. Because of approaching exhaustion of the Pittsburgh coal, this bed will be first in economic importance within a few years.

Computations show the Redstone coal bed to be of economic value in five townships. A number of measurements from its outcrop and from several mines have made possible a fairly accurate estimate of the tonnage available. A low percentage of recovery has been assumed for this bed, because when the Pittsburgh coal has been mined, the intervening rocks will cave, thus breaking this bed and making its recovery difficult and costly.

The Lower Kittanning coal bed has been considered as of economic importance and its contents computed in five townships, all lying east of Chestnut Ridge. A fair number of measurements are available from its outcrop and from mines along the Conemaugh River. Available drillhole records show this coal to be extremely variable in thickness and of no economic value west of Chestnut Ridge.

Drillhole records show the Middle Kittanning coal to be fairly persistent and of fair thickness in the western part of the county. An average thickness of 3 ft. has been used in eight townships where its existence has been established. A recovery of only 50 per cent has been assumed for this bed, because of meager data regarding its thickness and continuity.

A fair number of measurements have been gathered from the outcrop of the Waynesburg bed and from its development. It has been considered and computed as of importance in Hempfield and Sewickley townships. This bed is broken by many partings, is variable in section, and in places is under shallow cover. For these reasons a low percentage of recovery has been assumed in figuring the minable tonnage. This coal is mined for domestic use in many places because it is readily accessible. Other coal beds also are worked for local use, but as they are not important and little is known of their extent and thickness, they have not been included in the computation of the reserves.

The total area of Westmoreland County is 1,062.6 square miles. The result of computing the coal reserves in this county based on the latest maps, engineering data and methods is shown in the accompanying table.

This gives the estimated recoverable tonnage by beds. The figures are given as computed. It should, however, be distinctly understood that while the acreage of each of the beds has been accurately calculated, the reliability of the average thickness of the coals assumed in the computation of tonnage decreases for the beds in the following order: Pittsburgh, Upper Freeport, Redstone, Waynesburg, Lower Kittanning and Middle Kittanning. Thus, while the figures for the Pittsburgh bed are conservative and probably reliable, those for the Middle Kittanning coal may be much too small or many times too large.

COAL RESERVES IN WESTMORELAND COUNTY, PA.

(In Net Tons)

Bed	Original Deposit	Mined Out	Recoverable
Pittsburgh	1,872,540,000	1,167,687,000	538,500,000
Upper Freeport	2,732,598,000	45,378,000	1,859,200,000
Redstone	324,900,000	2,970,000	163,200,000
Lower Kittanning	729,000,000	972,000	431,700,000
Middle Kittanning	706,644,000	324,000	297,500,000
Waynesburg	15,822,000	810,000	7,600,000
Totals	6,381,504,000	1,218,141,000	3,297,500,000

Unmined Coal in Cambria County, Pa., Is Estimated at 4,278,577,500 Tons

WITH a production averaging around 17,000,000 tons of bituminous coal each year and with a supply underground to maintain this rate of production for the next 250 years, Cambria County, Pennsylvania, ranks high among the great bituminous producing centers in the United States.

Cambria County has an area of 675 square miles and underneath this area are the following seams of coal in the order of formation: E, known as the Upper Freeport or Lemon seam; D, known as the Lower Freeport or Moshannon Limestone seam; C Prime, known as the Upper Kittanning or Cement seam; C, known as the Middle Kittanning; B, known as Lower Kitanning or Miller Peacock seam; A Prime, known as the Clarion seam, and A, known as the Brookville-Seymore seam.

A. B. Crichton, a Johnstown mining engineer, estimates that there were originally 4,669,440,000 tons of coal underneath Cambria County land. Figures compiled since the first records of coal being mined in the county were taken show that 390,862,500 tons have been taken out, leaving a total tonnage of 4,278,577,500 still remaining to be mined.

The first record of mining in Cambria County goes back to 1843, when 973 tons were taken out. In the period from 1844 to 1879, inclusive, it is estimated that 4,000,000 were mined.

AT THE PITTSBURGH (Pa.) experiment station of the United States Bureau of Mines, Dr. Reinhardt Thiessen is continuing the study of the origin and the changes of the cellulose, ligno-cellulose and the resinous matters from peat through the lignite into coal.

Keeping Nickel-Iron Storage Batteries in Condition*

Exclude Foreign Material from Cell Containers — Oil Cell Tops — Before Overcharging or Renewing Electrolyte Bring Potential to Zero — Never Rinse Cells with Water or Discharge Battery at Over Six Times Normal Rate

By M. F. Packard
East Pittsburgh, Pa.

IN THE nickel-iron battery an alkaline instead of an acid electrolyte is used, and corrosion or disintegration of wood linings and trays will not occur. Current leakage, grounds and short-circuits, however, may result from the presence of foreign material, moisture or electrolyte spray and froth, hence it is just as important with the nickel-iron as with the lead battery that all these substances be kept from the compartment and trays or promptly removed when they appear. Exclusion of foreign material is perhaps more important because the cell containers in this case are metallic and therefore conductors.

To prevent accumulation of dry electrolyte crystals and to make cleaning easier the tops of the cells should be kept covered with a thin coat of special oil furnished by the battery manufacturer. This oil should be carefully kept from the poles and other contact surfaces. In spite of frequent wiping, incrustations of dry electrolyte crystals probably will form on the tops of the cells, and these crystals should be removed about every two months. The trays should be removed from the compartment, cleaned with a steam or air blast (no incrustations being allowed to fall between the cells) and carefully dried before re-installation. The tray terminals should always be marked so as to insure that they will be replaced in the correct position.

Occasionally an insulating paint that is proof against alkali should be applied to the cells and trays. Before this is done all surfaces should be cleansed of grease and dirt and carefully dried to make the paint adhere effectively.

NICKEL-IRON BATTERY LOSES WATER FAST

Water is lost in this type of battery from the same causes as in the lead accumulator. The quantity thus lost, however, is much greater, and more frequent renewal is required because the ampere-hour efficiency is less and the amount of necessary overcharge appreciably larger. Exposure of a portion of the plate surface and concentration of the electrolyte through neglect to water a battery will have an adverse effect upon its life and performance.

If a battery is being used normally, the water lost should be replaced ordinarily every two or three days. It should not be introduced during charge, as the gassing creates a false level. Except for this precaution water may be added at any time, as the specific gravity of the electrolyte does not change from charge to discharge and consequently is no indication of the state of the battery.

Water may be conveniently added by a semi-automatic filling device furnished by the manufacturer. Overfilling is guarded against by an alarm sounded when the correct level is reached. Ordinary methods of filling are permissible, but care must be exercised neither to exceed the specified level nor to slop water over and around the cells.

Instructions sent out with the battery designate the correct depth of the electrolyte over the tops of the plates. This height easily may be checked by means of an open glass tube of not less than $\frac{3}{8}$ in. inside diameter, with ends made square and even. The tube is inserted vertically through the filler opening till it rests upon the tops of the plates. The exposed end is then closed with the finger and the tube withdrawn. The height of the liquid in the tube will be the depth of the electrolyte over the plates. This test should not be made while the battery is being charged.

BUBBLING MAY CAUSE SOLUTION TO OVERFLOW

Solution will be forced out of the cell during charge if the surface stands at too high a level. This will weaken the electrolyte remaining, add to the burden of care and may result in insulation troubles; hence it is important not to have the level too high. Water for the alkaline battery must be selected and stored just as carefully as has been detailed for the lead battery.

This type of battery will require an occasional renewal of the electrolyte and at times may need special attention to overcome apparent loss of capacity. It should seldom need repair except as the result of an accident or a ground. Any cell that has been damaged should be removed and returned to the manufacturer for repair. It hardly will be worth while to acquire the skill and equipment necessary for field repair work.

Sluggishness and loss of capacity may or may not arise from deterioration of the electrolyte. If such a condition develops, the battery should be given a long overcharge at the normal rate followed by several cycles of normal discharge and charge. It is advantageous always to discharge a battery to zero voltage before overcharging. If normal condition is not restored by this treatment and the specific gravity of the electrolyte is 1.13 or less the solution should be changed.

Preparatory to renewing the electrolyte the battery should be discharged to zero voltage. The trays should be removed from the compartment and the old solution poured out, using a portion for rinsing. Water should never be used for this purpose. The new electrolyte should be introduced as quickly as possible, as the cells may be injured if allowed to stand empty. It will be found advantageous to work on a few cells at a time. Only glass, enamel ware or rubber utensils should be used for handling the electrolyte. The cells should be refilled to exactly the correct height and when so refilled and reassembled the battery must be given a long overcharge at the normal rate.

It is advantageous to procure fresh electrolyte of correct specific gravity from the battery manufacturer or to mix it in accordance with his instructions. A potash solution is conceded to be far preferable to that having a soda base. The specific gravity should be approximately 1.25. Providing the rinsing of cells has been done with the old solution, the new solution upon being poured into the containers will fall only to the correct specific gravity of 1.17 to 1.19. This fall is due to the diluting effect of the old electrolyte which the pores of the plates retain.

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*Companion article to "How the Life and Performance of the Lead Storage Battery May Be Extended by Proper Care," which appeared in the issue of May 4.

In locomotive duty it is seldom advisable to discharge the battery at a rate exceeding six times normal. If the most severe demand is not kept within this limit the average rate of discharge usually will be too great for best performance and life. If approximately six times the normal rate is exceeded the power output of the battery will actually be decreased because of the high internal loss sustained, and usually nothing can be gained by going to this extreme. Best results will be obtained if the average demand is one and one-quarter times the normal rate or less, because otherwise poor voltage, overheating and shortened life may be expected.

As in the case of the lead battery it is advisable to use an ampere-hour meter as a guide for regulating the charging and discharging of the battery. It is even more necessary in this case because the specific gravity of the electrolyte cannot be employed as a measure of the charge, and terminal voltage alone is an unsatisfactory and unreliable guide.

Portable Electric Tool That Acts at Will Either as Drill or Grinder

COMBINATION tools, while despised by some mechanics, nevertheless have a faculty of "coming in handy." This is particularly true in the small shop, in which as a rule special tools for special purposes are not available. One of the latest tools of this character particularly adapted to the mine machine shop is the combination electric drill and portable grinder shown in the accompanying illustration.

Heretofore it has been difficult to produce a machine of this kind, because of the wide variation in speed demanded by the drill and the abrasive wheel. It is asserted by the makers that this difficulty has been surmounted in the present machine, which will not only drill holes up to $\frac{3}{8}$ in. in steel but when fitted with a 6 x $\frac{3}{4}$-in. grinding wheel will cover average requirements of a portable grinder. Of course, two separate speeds are provided, the change from one to the other being extremely simple and easy to make.

WILL DRILL OR GRIND AT WILL

As will be noted, when grinding the handles are dispensed with. They can be removed by unscrewing. The socket ends of the cable are shown in the illustration. They can be screwed into a light socket and are thus readily connected and disconnected.

The switch lever is located in the top or D-handle, the control being quick and positive at all times. Aluminum castings and ball bearings are used throughout and the tool as a whole, while simple in construction, is yet sufficiently rugged to withstand the rough usage to which it will inevitably be subjected. The motor, which is of the universal type, capable of operation on either direct or alternating current of a given voltage, develops ½ hp. under load. The total weight is 18 lb., the tool thus being light enough to be readily carried about and operated by one man.

At the mine it is in the car shop where many holes must be bored in hard wood, while occasionally steel must be drilled, that a machine of this kind is most useful. This combination drill is being manufactured and sold by the Wodack Electric Tool Corporation, of 23-27 So. Jefferson St., Chicago, Ill.

Would So Slant Cage Hoods as to Prevent Coal or Water from Falling on Cagers

BY R. W. LIGHTBURN
Gans, Pa.

IN THIS era of accident prevention many are the safeguards being applied to the machinery by which shafts are operated. Thus cages have safety catches and the main rope is provided with chain attachments that will come into action if the socket should fail. In shafts where men are hoisted and lowered, an overhead covering of suitable material, commonly known as a cage top, bonnet or hood must be provided.

Why, then, is this hood usually built in such a manner that when the cage is standing at the landing any material falling on it will bounce off into the roadway and thus injure or, at least, hurt the men who may be near the shaft? I have seen some scores of cages, both of wood and steel, and the hoods of practically all of them had their slanting elements so placed that any object falling on them would glance either to the front or rear.

Wherever it can be avoided coal should not be allowed to fall down a shaft, but only with great difficulty can that be prevented. Many ways have been devised for avoiding this descent of materials, but despite the precautions, coal always is falling. Small pieces of coal or rock lodge on the cages and when they are displaced they are apt to fall on the cage traveling in the opposite compartment. Even when the cages are boxed in and the dumps are properly incased, the coal falling from cars with high topping will find its way to the bottom of the shaft and, if the cage top is not properly designed, to the roadways on either side of it.

Nor is danger the only reason for revising the position of the hood. The present design involves quite a little discomfort, because that which will deflect coal will deflect water also and thus make the work of the cagers unpleasant, especially if performed in the intake air, which often is chilly. To many minor accidents at the foot of the shaft I have myself been eyewitness, and frequently the coal bounced for some distance from the shaft.

Bearing these accidents in mind, I would advise as a safety measure that all cage hoods be so arranged as to deflect falling material toward the cage guides. At first it might appear difficult, if not impossible, to alter the position of the hood in the manner indicated, but, where timber is so long as to necessitate the lifting of the iron sheets of the hood, they readily could be lifted toward the cage guides. A rope could be passed over a pulley and attached to the hood and the material man or cage tender by pulling it could raise the flap and provide room for the emplacement of the timber. With this provision the danger of men falling down the shaft when lifting or lowering the hood would be avoided. Extra long timbers, rails and similar lengthy material generally are slung beneath the cage.

With the suggested type of hood it may appear difficult for the cage inspector to get at any of the chains or overhead rods, but that objection hardly is valid, for the arrangement is employed in all or nearly all European mines and it should be easy to imitate it here. As to the cost of making the change, that can be reduced by doing the work the next time a hood rod has to be straightened.

The accidents caused by the glancing of falling material usually are small. They do not incapacitate the men subjected to them. Nevertheless they are sufficient to cause a delay and may hold up the cage and lower the tonnage.

Proposes New Coal Classification

ORDINARILY coals are classified according to the ratio existing between the volatile matter and fixed carbon that they contain. This is, however, in many respects an unsatisfactory distinction. Prof. S. W. Parr, of the University of Illinois, recently proposed a new basis for classification, in a report before a meeting of the American Chemical Society in Birmingham, Ala. Professor Parr's classification arranges coals in groups according to the percentage of volatile matter that they contain and the heating value per unit of pure coal substance. This arrangement gives fairly definite groups in accordance with the natural characteristics of the coal that are independent of the fortuitous variations in ash or sulphur content.

The unit heating value of coal is determined by Prof. Parr according to the following formula:

$$\text{Unit value} = \frac{\text{B.t.u.} - 5000S}{1 - (1.08 \text{ ash} + 0.55S)}$$

In the above S, of course, signifies sulphur.

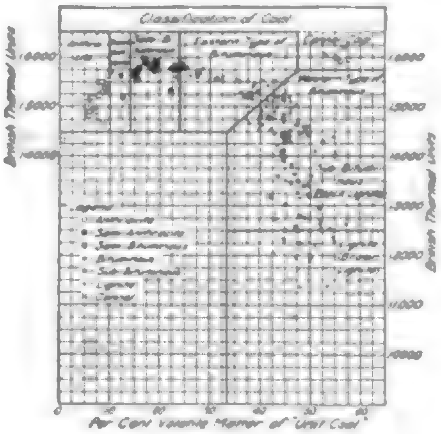
By this method the total heating value of the coal is corrected by the subtraction of the heating value of the sulphur contained. The remainder is divided by the quantity shown in the formula, in order to convert the heat derived from the coal substance proper into that per unit of this material present in the raw fuel. The factor 1.08 times the ash is employed in order to correct for the change in weight of the ash from that actually occurring in the coal to the condition in which it is weighed during analysis. Similarly, it is calculated that correction should be made amounting to 55 per cent of the sulphur content in order to account for that portion of the sulphur in pyritic form that is driven off during ash determination and thus not weighed with the ashes.

Ordinary methods of computing the heat value of the coal substance have been tested by Prof. Parr, but it is found that the results obtained vary considerably for coals from identical mines or beds having various percentages of ash or sulphur. This variation between the float and sink portions of the coal commonly ranges between 125 and 250 B.t.u., but may reach as much as 1,100 B.t.u. Obviously the true coal substance in each is identical and if the method were correct the heat value of this substance calculating from either the pure portion or the tailings from the washer would be the same. Employing the Parr formula, this actual result is found.

Variation of the several samples from the same source is shown by Prof. Parr to be usually only 10 to 50 B.t.u., even though the ash and sulphur content may be quite different. In some instances he has been able to determine the county or bed from which the coal was derived by determining its heat value per unit of pure coal substance.

The investigations conducted have been extended to cover not only coal from Illinois and Indiana but also bituminous coals from South Africa, Brazil and West Virginia, also cannel coal and anthracite.

Prof. Parr proposes the following heating value limit for a simple classification: Brown lignite, heating value per pound of coal substance, 11,500 to 12,500 B.t.u.; black lignite, 12,500 to 13,500; sub-bituminous, 13,500 to 14,000; Western bituminous, 14,000 to 15,000; Eastern bituminous, 15,000 to 16,000; anthracite, 15,500 to 16,000.



COAL CLASSIFICATION CHART

This chart shows how the coals divide under this classification much as they are already divided in common parlance.

A more satisfactory classification, however, is found if the heat value of the pure coal is made one co-ordinate of the coal's locus and the percentage of volatile matter the other. The accompanying illustration shows the results of applying this classification. It will be noted that each of the several varieties of coal is grouped close together and seldom strays into the field of other types. As a matter of fact, some of the results on sub-bituminous coal appear within the field of Western bituminous. In such a case it is believed that the nomenclature is in error rather than the heat-value measurement.

It is evident that difficulty would be experienced in drawing a sharp distinction between brown and black lignite, between sub-bituminous and the younger varieties of Western bituminous and between bituminous and semi-bituminous. This difficulty is quite sufficient to account for some uncertainty in the placing of a few samples whose characteristics put them near the border line between two adjacent zones.

FRACTIONATION OF LOW-TEMPERATURE TARS from Freeport coals has been completed by the Bureau of Mines at Pittsburgh, Pa., and the oils will be distilled. Data are being compiled for a report of the investigation.

Problems of Operating Men

Edited by James T. Beard

Fireboss' Mark Destroyed by Fall of Roof

Fireboss to Leave Two Marks to Avoid Possible Loss—Must Examine for Dangers Other Than Gas—Marks in Adjoining Places Evidence of Duty Performed

REPLYING to the question asked in *Coal Age*, Mar. 30, p. 538, regarding a fireboss' mark having been destroyed by a fall of roof that occurred between the time the place was examined and the men entered the mine for work, allow me to offer one or two suggestions.

The Bituminous Mine Law of Pennsylvania (Art. 5, Sec. 1) requires the fireboss to leave his mark "at the face and side of every place examined," as evidence that he has performed his duty. The purpose of the law in requiring the mark to be placed both at the face and side of each place is to avoid just what happened in this case. A fall of roof will hardly destroy both marks. This will require a little more time, but is the safest plan to follow.

FIREBOSSES MUST EXAMINE FOR OTHER DANGERS THAN GAS

Again, in the same section of the law, the fireboss is required to "examine for dangers in all portions of the mine under his charge," and to place a danger signal across the entrance to every place "where explosive gas is discovered or immediate danger is found to exist from any other cause."

The evident meaning of this law is that the fireboss is not to examine for gas only, but for other dangers that may exist in a place. It is particularly important that he should note the condition of the roof and, finding it weak, prevent any one from entering the place for work till it has been made safe.

In my judgment, had this fireboss complied fully with the requirements of the law, he would have discovered the weak condition of the roof and, on returning to the mine entrance would have reported the place as dangerous and withheld the check of the miner working there. Had he done so the accident would not have happened.

Mayport, Pa. JAMES THOMPSON.

OTHER LETTERS

IN REFERENCE to Joseph Dryna's question as to how a fireboss is to prove that he visited and examined a place, when his mark on the face of the coal has been destroyed by a fall of roof that occurred after he left the place and before the miner entered for work, let me say: If this place is driven in solid coal and was properly examined by the fireboss that morning, it could hardly happen that a fall of roof would occur in the short time that elapsed before the men entered for work.

It is the duty of a fireboss to carefully examine the roof, in every place in his charge, and know whether it is solid or loose and liable to fall. The fact that a fall did occur in this instance and released gas by which the miner was burned when he entered the place for work shows, to my mind, that the examination was carelessly made.

The Anthracite Mine Law (Act. 12, Rule 6) requires the person making the examination to mark the date thereof at the face of each place examined. The law does not specify that the mark shall be made on the coal. Now, taking everything into consideration and having due regard to the requirements of Art. 10, Sec. 4 of the anthracite law, requiring ample ventilation at the face of every working place in the mine, I cannot understand gas firing in his place when this miner entered.

My verdict is, therefore, if the fireboss making the morning examination had complied fully with the anthracite law and exercised his common judgment in examining the roof in each place, his marks would have remained as proof that he had done his work properly.

Hazleton, Pa. JOSEPH LAWRENCE.

WHEN a roof fall occurs, in a miner's place that has been examined by the fireboss only an hour or so before, and gas is released by the fall so that the miner is burned on entering his place a litle later, there must be some good reason that would make this possible.

My idea is that, in this case as in many others, the fireboss was given too large a territory to examine in the time allotted for that work. As a result, he did not make a thorough examination and failed to discover the weak condition of the roof that must have existed in the place.

He may have been a little late in reaching the mine or, perhaps, was detained longer than usual in other places and, in his haste to get back to the shaft bottom in time to make his report, did not examine the roof carefully, but assumed there was no danger from that source.

It may be that the last shot exposed a slip in the roof, which a closer examination would have revealed. Much more time is often required to examine a working place thoroughly, than what is ordinarily at the disposal of a fireboss. As a rule, he must keep on the run and too often his examination of the roof goes little further than a hurried glance and perhaps, one or two knocks with the butt end of a pick to see if it sounds hollow.

WHY A FIREBOSS SHOULD LEAVE MORE THAN ONE MARK IN A PLACE

As a fireboss, in examining my district each morning, it has been my habit to mark the date and my initials twice, in each working place examined. I would place one mark on the coal or on the roof close to the face and another further back, perhaps on the rib behind the post.

My aim in doing this is to avoid the chance of one of the marks being lost, as happened in this case. Another reason is that a fireboss' mark will sometimes be erased by a miner or by another official who has a purpose in so doing and desires to make a case out against the fireboss, because of some personal grievance.

The only way I can suggest that this fireboss can prove that he examined the place and marked the date as the law requires, is to show his marks in the two adjoining places. If these are found they would tend to prove that he had examined the other place in question and marked it in the same manner.

WILLIAM DICKINSON.

Lochgelly, W. Va.

REGARDING the instance cited in *Coal Age*, Mar. 30, p. 538, where a fireboss, making his first examination found his section safe and so reported it; but, during the interval preceding the entry of the men for work, a roof fall in one place destroyed his mark, in my opinion, it should not be difficult for him to prove that he had done his duty as required by law.

The bituminous law of the state (Art. 5, Sec. 1) makes it the duty of the fireboss to leave his mark both on the face and the side of each place examined and found to be safe. These marks are required as evidence of his presence in the place on that date.

Now, if a fireboss has done this and his marks appear in every place in his section on that date, I cannot see how the claim can be made that he had neglected his duty, even if it should be found that both the mark on the face and on the side had been destroyed by the roof fall.

Every one knows that a fireboss has not sufficient time, in making his first examination, to whitewash each working place with date marks. As a brother fireboss, however, let me suggest that it is always well to leave a date mark on a prop a short distance from the face besides the marks required by law.

Thomas W. Paterson.

Eriton, Pa.

HAVING fulfilled the duties of a fireboss, I can appreciate the feelings and position of a conscientious man when placed in the situation described in *Coal Age*, Mar. 30, p. 538. The inquirer asks how he can prove that he visited and examined a place where a fall of roof has since destroyed his mark left on the coal.

Naturally, his mark being gone, he cannot look to that as evidence that he performed his duties in compliance with the law. However, if this happened in a room where the face of the coal was near a crosscut leading to an adjacent room, the finding of his mark in that room would appeal to me as strong evidence that he had not failed in performing his task in the first room, which lay in the path of his travels.

On the other hand, if the fall happened in an isolated place apart from others, he would have to depend on his previous record for honest and faithful performance of these duties. The fall having occurred since the miner left the place the previous day, a close examination of the conditions where the fireboss claimed to have left his mark should, in my opinion, convince any mine inspector or jury that the man was entitled to the benefit of the doubt.

Not Always Possible to Make a Chalk Mark on the Coal

In my experience as fireboss, I have seen many places where the face of the coal was so wet and greasy that a chalk mark could not be made there. In such cases, I would place my mark on the inside row of posts or on a shovel, pick, ax or other tool, placing them in a conspicuous position against the working face. If I remember rightly the anthracite law does not specify that the mark must be placed on the coal but at the face.

The West Virginia mining law (Sec. 59) requires the fireboss to make his mark on a board placed at the face for that purpose, it being recognized that it is not always possible to make the mark on the coal. Let me suggest that it is always a good plan for the fireboss to make two or three marks in a place, thereby avoiding trouble should one or more of the marks be lost, as in this case.

At times, I have known of a fireboss' mark being rubbed out by a miner, in order to support his claim that his place had not been examined. At one mine where I was appointed fireboss, my friends cautioned me to always put a secret mark somewhere near the face of certain places in that mine, for the purpose of self protection against this fraud on the part of the miner.

Although it has never happened that I had occasion to refer to such secret marks in self defense, let me strongly urge every fireboss to take this precaution, which requires but a few moments more time and is a good safeguard.

Edwight, W. Va. J. W. Powell.

Making the Miner Responsible

Safety regulations here and in England—Fewer accidents there show effective system—Examination of mines here less frequent and less rigid—Miners must be made responsible for their own safety.

A SHORT time ago, a writer in *Coal Age*, comparing the English system of mine inspection with American practice, advanced some ideas that are worthy of special thought. I refer to the letter of James W. Taylor, *Coal Age*, Dec. 29, p. 1054.

He claimed that greater safety at the working face was insured, in English practice, by approaching the problem in a different manner from that adopted by the operators of American mines. He explained that, in the mines of Northumberland County, England, the question of safe conditions in the working places was not left to the judgment of the individual miner.

Firebosses' Duties in England

In those mines, deputies and firebosses were charged with the duty of setting the timbers, in each working place in their respective districts. They must perform this work when making their inspections. Before leaving a place, each must see that there is sufficient timber on hand; or take his measurements and have the needed timber sent into the place.

My experience has been gained entirely in this country and I am unable to judge of the relative conditions in the mines. My information, however, is that we are mining coal here under conditions far more favorable and less hazardous than in England, which I believe is true.

If, as Mr. Taylor states, there are fewer and less fatal accidents in those mines than here, one must naturally conclude that the fault lies in a less rigid and less frequent examination of the working places. This is probably where we fail in respect to making our mines safe.

My belief is that the English plan of making safety inspectors and firebosses set the timbers needed in the working places would surely be abused by the average miner, who would not wait for this work to be done before starting to load his coal. The result would be an increase instead of a decrease of accidents at the working face.

It has always been my theory that the surest way of reducing accidents at the face is to make each miner responsible for his own safety, by requiring him to set such timbers as are needed to make his place safe.

As a further precaution, we should insist on a more frequent and more rigid examination of the working places while the men are at work. There should be greater mine discipline and the authority of our safety inspectors and firebosses should be unquestioned. The adoption of such a plan would in no way relieve the miner of his personal responsibility in keeping his place safe.

It is well known that the time to set a post is NOW. Any delay is a gamble and flirting with death. The excuse of waiting for some one to do the job should not be tolerated. Every miner should know how to set timbers and be given the necessary tools to do the work.

George Edwards.

Pikeville, Ky.

Sinking or Upraising, Which?

Starting an upraise in a mine—Method of timbering when the material is soft—Relative advantages and disadvantages of sinking and upraising.

REFERRING to the question presented in the inquiry regarding the relative merits of sinking or upraising, *Coal Age*, Feb. 2, p. 212, let me say that only the most experienced men must be employed in driving an upraise. When that is done little difficulty should be experienced in the undertaking.

Without knowing the size of this shaft, one is unable to answer the inquiry as intelligently as if the size of the excavation had been given. However, assuming that this is an 8 x 10-ft. shaft, it is my experience that a considerable saving will ordinarily be realized by driving an upraise, instead of sinking from the surface.

Upraise Must Be Started on a Good Foundation

When starting an upraise, in a mine, the first round of holes can be drilled and shot from the level or gangway, without erecting any staging. When drilling for the second cut and others to follow, however, it will be necessary to build a stage or platform for the men to stand on while at work. This is constructed of heavy timbers to give a solid foundation.

After passing through the 6 ft. of slate and 4 ft. of sandstone that are said to overlay the coal seam, in this case, it is possible that the material above may be found to be not self-supporting but having a tendency to scale off and fall. In that event, a substantial system of timbering must be adopted.

At this point, it is necessary to make arrangements for building a good loading chute, which must be constructed of strong timbers, and given a proper inclination that will enable the excavated material to be loaded into the cars, without extra handling. The entire structure can be supported on heavy sills laid on the floor of the entry, or on crossbars set in hitches cut in the solid strata.

The timbering required to support the sides of the excavation, above the sandrock, can generally be rested on long collars set in hitches cut in the ribs. Where it is not desired to continue the timbering, except at points where the material requires support, the same method of setting long collars in hitches cut in the ribs can be employed, wherever the local situation may demand. Care must always be taken to give these first timber sets a solid bearing.

Little difficulty should be experienced in hoisting the necessary drilling equipment, timber and other supplies. This can be accomplished by fastening a chain around the last cap-piece or collar. In the absence of timber, a driftbolt can be wedged into a hole drilled in the strata.

Advantages of Upraising

It is not my purpose to compare the relative equipment required in sinking and upraising. But, in respect to the relative advantages of upraising, it must not be forgotten that the work of drilling need not cease while the excavated material is being removed, as is necessary in sinking. Another important advantage is that the excavated material can be loaded into a car standing beneath the chute and requires no extra handling.

If the dimensions of the proposed shaft exceed what I have assumed; or, range about 10 x 21 ft., I would unhesitatingly recommend the sinking of a shaft, in preference to upraising. When sinking a shaft of this kind, the centercut can be used effectively to expedite the work.

When sinking a large shaft over mine workings, the water should always be drained into the opening below, through a borehole in the center of the excavation, and this will also enable the work to be prosecuted with a less number of holes, which means a saving of labor and explosives.

In sinking, owing to the accumulation of dirt and loose material, blind holes are often drilled to no purpose. It is true this accumulation of debris might be cleared and hoisted to the surface; but that is not generally done. Upon one starting to drill, the operation is continued, until the round of holes is completed, barring any unavoidable delay.

R. H. Benney,
Fort Wayne Rock Drill Dept.
Charleston, W. Va.

Novel Method of Sinking a Shaft

Upraising not advisable in soft material—Sinking by aid of boreholes—Hoisting and pumping avoided.

With much interest, I noted the inquiry regarding the practicability of upraising a shaft, under certain conditions, as published in *Coal Age*, Feb. 2, p. 212. It reminds me of an article I published in the *Engineering and Mining Journal*, Apr. 7, 1917, describing a successful operation of this kind performed at low cost.

In that case, however, the rock passed through was very hard and solid. It stood up well without support, which made it safe to employ the method of upraising of which I have always been a strong advocate whenever the conditions will permit of its adoption. I doubt very much whether the method would be practicable in the strata described by this inquirer.

Excavated Material Dropped Through Borehole into the Mine

In this connection, allow me to refer, briefly, to another method that is sometimes employed and which offers many of the advantages of upraising. It is as follows: The excavation is started from the surface and proceeds downward. Before the work is begun, however, a borehole of large diameter, say about 14 in., is sunk in the center of the site of the proposed shaft.

That being done, a strong heavy chain long enough to reach to the bottom, is hung in the hole. In the prosecution of the work, the shaft is "milled down" the full size of the excavation. The material excavated is dropped through the hole into the mine cars and hauled away to be hoisted, or stowed somewhere in the old workings.

Chain Hung in Hole Prevents Clogging of Material

Two things are important, in this method. First, the bottom of the hole must be cut out in the shape of a funnel so as to provide for the more ready escape of the material from the hole. This will greatly assist in keeping the hole clear and preventing the clogging of the material. Should that occur, however, the chain hung in the hole provides a ready means of loosening the material so that it will fall to the bottom.

Aside from the fact that some mucking must be done, this scheme presents most of the advantages of upraising and avoids the disadvantage of that method due to working under a treacherous top, to say nothing of the need of ventilating an upraise. In addition to affording a convenient and cheap method of disposing of the material excavated, the borehole affords good drainage to the shaft and eliminates the necessity of pumping.

C. F. Jackson,
Cleveland, Ohio. Mining Engineer.

Inquiries Of General Interest

Length of Shadow Cast by Sun

Length of Shadow Determined by Altitude of Sun—Sun's Altitude at Noon Equal to the Co-latitude of the Place, Plus a North Declination, or Minus a South Declination

Kindly permit me to ask, through the columns of *Coal Age*, for the solution of the following question: What would be the length of the shadow cast at noon, on the twenty-first day of March, 1922, by a 25-ft. vertical pole, at Nanaimo, British Columbia, taking the latitude of the place as 49 deg. 10 min., north; and assuming the sun's declination, at that time, as 0 deg. 11 min., north?

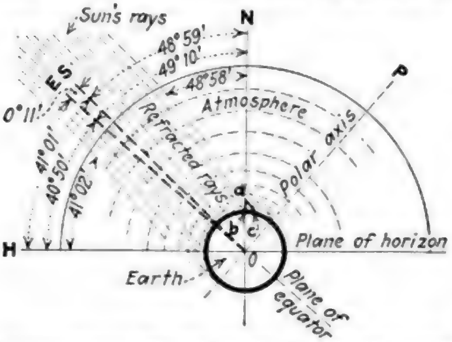
Fernie, B. C., Canada. Student.

The first step in the solution of this problem is to calculate the true altitude of the sun, at noon, for the given latitude and declination. At the time of the equinoxes, or when the sun is on the equator, its true altitude is equal to the co-latitude of the place, which in this instance is $90° - 49° 10' = 40° 50'$. When the sun is north of the equator, however, its altitude, at noon, is increased by its declination, which is here given as 0° 11', making its true altitude, in this case, $40° 50' + 0° 11' = 41° 01'$.

Now, referring to the accompanying figure, which represents a meridian plane passing through the place of observation, *O* is the center of the earth, *OP* its polar axis and *OE* the projection of the celestial equator on this plane, while *OH* is the intersection of the meridian plane with the plane of the horizon. In the figure, the vertical 25-ft. pole is represented by *ab* and its shadow by *bc*, parallel to the plane of the horizon. The position of the sun is indicated by *S*, the zenith by *N* and the north pole by *P*.

The sun being at, practically, an infinite distance from the earth its rays are parallel, as indicated by the light dotted lines in the figure. As these lines pass within the atmosphere of the earth indicated by the light dotted curved lines, they are refracted through an angle depending on the altitude of the sun. For an altitude of 41° 01', this refraction of the sun's rays is practically 1', which must be added to the true altitude of the sun at noon, to obtain the observed altitude, for calculating the length of the shadow cast.

Except in special cases, the correction for parallax or refraction is so small that it need not be considered. It should be stated here that the length of shadow cast by the sun, for any time during the day can be calculated at once, by measuring the altitude of the sun with an engineer's transit. This is the observed altitude and is always greater than the true altitude, by the amount due to the refraction of the rays in passing through the atmosphere.



DIAGRAMMATIC SECTION CUT BY A MERIDIAN PLANE

In any case, having found the observed altitude of the sun, subtract it from 90 deg. and multiply the vertical height of the pole by the tangent of that angle. In this case, the true altitude of the sun, at noon, for the given latitude and declination, being 41° 01', its observed altitude is 41° 02'; and the complement of this angle is 48° 58'. Hence, for the length of the shadow cast at noon by a 25-ft. vertical pole, we have 25 × tan 48° 58' = 25 × 1.149 = 28.7 ft.

Examination Questions Answered

Examination, Foremen and Assistant Foremen, Sixteenth Anthracite District

(Hazleton, Pa., April 11-14, 1922)

QUESTION—*What means are necessary in order to properly conduct an air current to the working face? Which is more easily ventilated a hole being driven up the pitch or one dipping and why?*

ANSWER—Beside the usual doors, stoppings and air bridges, required to conduct the air current through a mine, it is often necessary to erect lines of brattices consisting of boards or canvas nailed to posts to conduct the air current beyond the last crosscut or breakthrough and make it sweep the working face of a breast, chamber or heading.

The question of whether a rise or dip heading is more easily ventilated will depend on whether the place is generating marsh gas or blackdamp. If the heading is generating marsh gas, it is more easily ventilated when driven to the dip than when driven to the rise, since this gas will tend to rise from a dip working, but will accumulate at the face of a pitch where it is not easily dislodged.

The same is true of blackdamp which will gravitate down a pitch, but accumulate at the face of a dip heading. Therefore, where blackdamp is generated in a heading, the ventilation is less difficult if the place is driven to the rise.

QUESTION—*What is the amount of rubbing surface in an arched airway 2,000 ft. long, the top being semicircular; the height from the floor is 10 ft. and the width 14 ft?*

ANSWER—The height of the crown of the arch above the floor being 10 ft., and the span of the arch 14 ft., the vertical sidewalls are each $10 - \frac{1}{2}(14) = 3$ ft. in height. The perimeter of a semi-circle having a diameter of 14 ft. is, $\frac{1}{2}(3.1416 \times 14) =$ say 22 ft. The total perimeter, including the semicircular arch, the sidewalls and the floor of this airway is then $22 + 3 + 3 + 14 = 42$ ft. The rubbing surface of this airway is, therefore, $2,000 \times 42 = 84,000$ sq.ft.

QUESTION—*If an airway 9 x 6 ft., in section, has a total rubbing surface of 54,000 sq.ft., what is its length?*

ANSWER—The cross-section of this airway being a rectangle, its perimeter is $2(6 + 9) = 30$ ft. Then, for a rubbing surface of 54,000 sq.ft., the length of this airway is

$$54,000 \div 30 = 1,800 \text{ ft.}$$

QUESTION—*How large should a passageway be that is used both by persons and for transportation?*

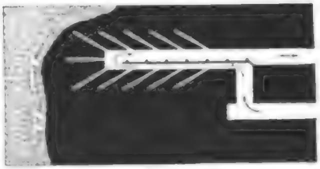
ANSWER—A haulage road that must be used by men going to and from their work should be driven wide enough to allow a safe clearance on one side of the road, in order to enable persons to pass the loaded cars safely. The required width of the entry will depend on the size of the cars in use. In any case, the clearance space should not be less than 2½ ft. between the side of the car and the rib.

QUESTION—*To what extent should a first-aid man attempt to render assistance in a mine?*

ANSWER—In the case of accident, first aid should only be rendered an injured person to the extent that will make him more comfortable if bones are broken; stop the flow of blood if an artery has been severed; and avoid collapse by removing the patient to better air and administering artifical respiration if unconscious and suffering from shock. While waiting for the doctor, no attempt should be made to act his part, further than doing what is necessary to preserve life and prevent further injury and loss.

QUESTION—*In driving a place towards water, what precaution is necessary and what width of hole would you drive?*

ANSWER—Every precaution must be used to avoid a sudden inflow of water that would flood the workings. When approaching a place filled with water, a single heading should be driven not exceeding 10 or 12 ft. in width. A drillhole should be kept at least 20 ft. in advance of the face and slant holes should be drilled in each rib making an angle of about 30 deg. with the heading and 8 or 10 ft. apart, as shown in the accompanying figure. A close watch must be kept to detect the first appearance of water seeping through the strata at the floor. Wooden plugs must be kept in readiness to plug any hole tapping the water.



HEADING APPROACHING OLD WORKS

QUESTION—*A charge of powder or other explosive, in coal or rock, has missed fire; how should the charge be withdrawn or the hole reopened?*

ANSWER—No attempt should be made to withdraw the charge in case of a misfire. In that event, another hole should be drilled about a foot from the first and a new charge inserted in this hole and fired. Care must then be taken to ascertain if the charge in the first hole is exploded by the firing of the second blast. If that is not the case, the unexploded cartridge must be sought in the broken coal dislodged by the shot and the greatest care must be exercised to avoid possible accident.

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Book Reviews

Insecurity of Coal Miners' Earnings

CAREFULLY selected figures and a well-ordered argument distinguish Louis Bloch's booklet entitled "The Coal Miners' Insecurity; Facts About Irregularity of Employment in the Bituminous Coal Industry of the United States," written on behalf of the Department of Industrial Studies of the Russell Sage Foundation. A preface is written by Mary Van Kleeck, director of the department of industrial studies of that Foundation.

Though the figures are chosen without noticeable bias and the argument is well ordered, the investigation leads only to false conclusions. For instance, the writer of the preface declares that irregularity of employment is the reason for the number of strikes. Those who are in the industry know that outside of the biennial adjustment periods, which always tend to be characterized by strike activity, most strikes occur when employment is steady. Repeated strikes, for any reason or none whatever, occur when the coal business is flourishing and railroad cars are plentiful. It is not brooding over irregular work that causes strikes but always the hope of getting higher and higher wages. Some would say it is a desire to graft, and not a real grievance, that is the cause of the strikes in the coal industry.

As the preface writer is about to turn the matter over to Louis Bloch she says, "Not the wage rate only but the opportunity to earn wages regularly is vital to the miner." The mine worker in the bituminous mines when he works will get $5.25 a day and over, should the wage reduction be 30 per cent. His fellow in the same state working on roads, in metal mines, cement works and other like labor, is getting $2.50 or less for eight hours. When a man is getting twice as large a wage as his fellow why should he be disposed to strike, even though he can show he is getting a third less time? Four days a week at $5.25 is $21, and six days a week at $2.50 is $15. With all his unsteady work if his wage is lowered he will be getting in normal years 40 per cent more than his more regular neighbor, and as the idle time is his own he can use it in doing other work or in the pleasures of the hunt or of the stream.

Neither Mr. Bloch nor Mary Van Kleeck has anything to say as to unemployment in other industries. They leave it to be inferred that there is none. Reading the booklet one would imagine that other industries were steady and that the miner has an unfortunate monopoly on unemployment. But this is far from true even in prosperous times. Beyond question other industries besides mining are overdeveloped and seasonal, and most of the unskilled men engaged in them drift around from job to job except in times of depression, when they may have to do entirely without any work. The miner, however, always has some work in his own industry.

Mr. Bloch says the worker in the small mine has less steady employment than in the large one. Very true. At times, indeed, his opportunity to work may be inadequate to supply his living needs, but the man in the small operation has the advantage because, as he has few fellow laborers, he has few rivals when, his mine being closed down, he has to look for work on the farm, or at road mending or road building or for some other employment. At large mines, which are frequently in inaccessible places and which have many men who cannot all find work of another kind, the uncertainty of employment is more severe in its effect if somewhat less frequent in its occurrence. It is unfortunate that we do not have figures showing how many of the non-mining days of the miner are spent in toil which brings him profit.

However, it may be conceded that there are parts of the coal field where the work in small mines is not, and cannot be, well supplemented by labor of any other kind. It is true, as the Illinois and Indiana operators allege in Mr. Bloch's quotation, that "the men are subject to call," but do they always come when called? They do not. Many men during the slackest part of the year absent themselves altogether, and their connection with the mines is solely that of contributors to labor-union funds.

With all due respect to F. G. Tryon, of the U. S. Geological Survey, we cannot feel assured that his figures for the capacity of the mines is not excessive, for mine workers will not continuously work at top speed, and when patriotism or a coming strike does not spur them to accomplishment they tend to lay off one or more days a week. Besides, there are holidays that are provided in union contracts and are always observed and many other holidays that are not part of the agreement but are kept with regularity by some of the mine workers. It would appear that Mr. Tryon's is a fairly large figure for the present productive ability of the country, even though the mines, if fully manned and all running to capacity, could produce more.

The statement as to the effect of car shortage made in the *Survey Graphic* by F. G. Tryon and W. F. McKenney, also of the U. S. Geological Survey, and quoted by Louis Bloch, needs amplification. There is much profound truth in the statement that "No doubt we need more cars, but simply increasing transportation facilities will not mend the broken year of the coal miner. . . . More cars . . will not sell more coal. . . . Car shortages have occurred not infrequently; but it is a curious fact that rarely have they curtailed the actual consumption of coal." That is true; yet car shortages are the indirect cause of the broken year, for when they occur there is a natural rise in prices, new mines are opened, old mines try to increase production and the hunt for men causes an increase in the working forces, resulting in the excess of men so greatly regretted by all who study the coal industry—and who has not studied it? As a matter of fact, both strikes and car shortages greatly increase the number of men employed and thus make the year of the miner short several days.

Mr. Bloch's statement of earnings for 1921 is based on Jett Lauck's declarations. The sources of information of that economist are known to be vitiated by omission of yardage and deadwork, and Mr. Bloch in accepting them has not a word to say about the fact that these yearly earnings are low only because the men in the union districts, which alone are cited, failed to meet the wage scales in non-union fields and so surrendered their opportunities to share proportionately in the tonnage mined and shipped to market. By holding out for wages above those paid in non-unionized districts and in other industries in their own mining regions they deliberately deprived themselves of the opportunity to mine their natural percentage of the whole production of the country.

As for the quotation that the author makes from Prof. Ogburn, to the effect that a fair health-and-comfort budget in January, 1920, would have been $2,243.94 a year, its inclusion in this story is permissible only because it forms part of the union's argument. In itself it is less than nothing, and it represents the workmen in the United States as pretty generally "submerged," for only the more skilled men or men having to meet city rents and expenses are in receipt of the wage advocated by Prof. Ogburn as a minimum.

THE E. E. WHITE COAL CO., at Glen White, in the Winding Gulf district of southern West Virginia, is operated non-union. The 242 miners in the Glen White mine of this company averaged $1,997.95 in earnings during 1921 for 192 days' work, while the 247 miners at the Stotesbury mine of the company averaged $1,871.84 for 200 days' work. Machine cutters earned $158.02 for the last two weeks in March, while machinists made $93.60; wiremen, $80.73; motormen, $78.39; trackmen, $70.20; bratticemen, $69.30; plant repairmen and blacksmiths, $75, and other wages were in like proportion for the last two weeks of March.

THE FIRST-LINE TRENCHES of prosperity are the excavations for new buildings.—*Asheville Times.*

Two Viewpoints on a Moot Question

UNDER the caption "Mutual Contract Responsibility Remedy for Coal Mine Strikes," the following editorial appeared April 28 in the *Chicago Journal of Commerce*:

"The recurrent evidence of the helplessness of the 'average man' who in the aggregate is called 'the public,' is made clearly manifest in the oft-repeated inquiry 'What can be done about it?' Nor can the responsibility of providing the remedy be evaded except at the cost of accepting the burden that comes from shirking an unpleasant task.

"To coal operators as with other large employers of labor when similar difficulties are by them faced, the answer seems very simple and direct. Do not put labor outside the laws, either statutory or economic, that govern others. Make organized labor responsible for its acts. The spirit of true democracy contemplates that while absolute liberty, not license, shall be guaranteed, the individual must assume responsibility within the law for his every act. Why should any group be free of this individual restriction? To indicate particular groups that for any reason shall be indulged is discriminatory. All of the coal-mine labor difficulties of the past several years as well as the present immediate situation spring directly from this cause. Twenty five years' experience with joint collective bargaining in the Central Competitive field proves this beyond any doubt whatever.

"In the early days of this relationship it was recognized that contract responsibility was mutual. Today's arbitrary manifestations of coal-mine labor are only the result of its capitalization of the growing legislative and public indulgencies that have been granted from time to time during the past six or more years.

"Unrestrained power breeds intolerance and disrespect for the rights of others.

"Recall the injunction against the miners in October, 1919. What did it avail? Was the public interest helped or injured as a result of this flagrant disregard of the judiciary?

"Recall the compromise adjustment made between the United States Attorney General and the officers of the United Mine Workers, in direct opposition to the recommendations of United States Fuel Administrator Garfield.

"On the basis of this adjustment the miners were guaranteed immunity from court contempt and were requested to return to work at a very substantial wage increase, an advance which Dr. Garfield felt was wholly sufficient for total adjustment. Question of a further increase was, however, to be considered by a commission, appointed by the President, who granted still further increases. We had the assurance of Dr. Garfield that this additional award was absolutely unnecessary for equalization of earnings with living cost.

"Certainly the flagrant vacation of the coal commission award and the forcible demand for further advance within four months makes absolutely clear the necessity for establishing responsibility. This one contract breach cost coal consumers of the country well over $100,000,000.

"Although the remedy of making labor organizations equally responsible under the law seems simple as a statement of essential equity it must be recognized that its application will be difficult and absolutely impossible while politics joined to public indifference shall permit the continuation of indulgences and of discriminatory legislation to the mine workers or to the entire group of organized labor that, regardless of noisy allegations, represent a very small percentage of the working force of the county and a very much smaller part of the total number of coal consumers who must pay the bills resulting from such indulgences.

"Both statutory and economic laws operate directly against coal operators with full force and effect.

"By reason of such fact, the capital invested in coal-mine operation throughout the past fifteen months has gone forward at a substantial loss in practically every bituminous district.

"Meanwhile, previous methods of joint interstate wage bargaining have been legally condemned and with outstanding indictments still pending there is no way in which a new wage scale may be negotiated except by each state group, within its own state borders and under its own state laws.

"This procedure, however, is forbidden by the officers of the international organization of the United Mine Workers.

"Could such a situation have developed or would present conditions with respect to the mine labor situation prevail if the United Mine Workers of America were made legally responsible?"

ELLIS SEARLES UNEARTHS ANOTHER CLAMOR

The following communication from Ellis Searles, editor of the *United Mine Workers Journal*, was sent under date of May 1 to every Senator and Representative in Congress:

"Newspapers all over the country are clamoring for a thorough investigation of the coal industry, with a view to finding out just what should be done to correct the many evils with which it is afflicted. The press has at last come to realize the deplorable condition of the coal business, from the mine to the coal bin. There is something wrong with it, but no one has yet been able to point out a definite method for the correction of these things. But the present strike has brought the entire matter to a focus. People are wondering why it is that the miners are compelled to undergo the hardships of a strike. They want to know why the country must from time to time submit to a shutdown of the mines while the various interests in the industry fight out a controversy. The public thinks, now, that it is time to do something to render unnecessary future strikes and lockouts. They want a steady flow of coal from mine to consumer, and they know they cannot get it so long as the industry remains in its present unorganized, disorganized, chaotic condition.

"The press, the public—everybody—realize that first of all there must be a full and complete investigation and study of the coal industry before it will be possible for anyone to map out a safe and sane policy for its conduct in the future. Nothing could be accomplished through a haphazard investigation that would merely skim the surface of the trouble. Any investigation that is undertaken must go to the grass-roots of the industry and uncover everything. There should be a study of wages, prices, profits, costs, supply, railroad rates and everything else. Everyone connected with the industry, including miners, operators, dealers, brokers and consumers, should be required to lay before the investigating commission every fact and bit of information that could throw a particle of light on the problems involved.

"Coal operators and coal companies should not be permitted to hide any of their books, papers or figures, as they have done in the past and are doing today. No one has as yet been able to ascertain from operators and coal companies the truth about their costs, their prices and their profits. Whatever legislation is enacted on this subject should not fail to take this fact into account.

"There is no secret about miners' wages. Everybody knows what they make. It will be easy to find out how much it costs a miner to keep his family. It will be easy, also, to learn all about the way a miner must live, his surroundings, his environment and his possibilities, and all of these things should be taken into careful consideration in the formulation of legislation to meet the case.

"A strike or a lockout never settles anything permanently. They simply act as a quieting powder when it is administered to a suffering patient. The coal industry can be stabilized if the proper method is followed. This cannot be done through compulsory arbitration, nor can it be done through airtight government control, such as existed during the World War. It must come about through the medium of the discovery of facts and the application of justice and common sense. Congress has a duty to perform along that line."

Mines Buy Steadily During Strike Period

IMPROVEMENT and rehabilitation of coal-mining properties in various fields continues steadily through the strike period. Two Chicago engineering concerns alone report contracts totaling about $200,000, involving, in most cases, the re-equipment of mines to increase their capacity and improve their product preparatory to the coal campaign that will follow the strike.

The Sargeant Coal Co., at Newburg, Ind., will have ready for operation by June 1 a modern steel tipple fully equipped with screens and loading booms for three tracks. Before the cessation of work by miners this mine was producing about 800 tons a day. When operation resumes the plant will be able to handle 1,200 or more tons. The shaft will be reamed to increase the size of the cages and allow the use of larger pit cars. The Krehbiel Company are the consulting engineers. The same firm is installing three loading booms for the Harrisburg Coal Mining Co. at Harrisburg, Ill.

Four installations are now in progress in Ohio, Kentucky, West Virginia and Pennsylvania under the direction of Jacobsen & Schraeder, Inc. The Kentucky Block Fuel Co. is getting a tipple, preparation plant and dump house to make and load three sizes of coal on two tracks at its mine at Jonancy, Ky. The output of this mine will be about 800 tons a day. At Hopedale, Ohio, a tipple and dump house are in process of erection for the Coal Land Development Corporation at a cost of approximately $35,000. This is a strip mine with a daily production of about 1,600 tons.

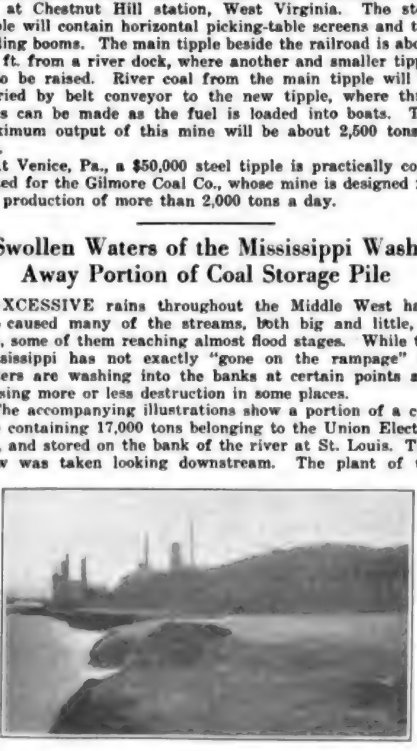
A complete preparation, storage and loading plant is now under construction at the new mine of the McKeefrey Coal Co. at Chestnut Hill station, West Virginia. The steel tipple will contain horizontal picking-table screens and two loading booms. The main tipple beside the railroad is about 600 ft. from a river dock, where another and smaller tipple is to be raised. River coal from the main tipple will be carried by belt conveyor to the new tipple, where three sizes can be made as the fuel is loaded into boats. The maximum output of this mine will be about 2,500 tons a day.

At Venice, Pa., a $50,000 steel tipple is practically completed for the Gilmore Coal Co., whose mine is designed for the production of more than 2,000 tons a day.

Swollen Waters of the Mississippi Wash Away Portion of Coal Storage Pile

EXCESSIVE rains throughout the Middle West have caused many of the streams, both big and little, to rise, some of them reaching almost flood stages. While the Mississippi has not exactly "gone on the rampage" its waters are washing into the banks at certain points and causing more or less destruction in some places.

The accompanying illustrations show a portion of a coal pile containing 17,000 tons belonging to the Union Electric Co., and stored on the bank of the river at St. Louis. This view was taken looking downstream. The plant of the electric company may be seen in the distance while still farther away appears a portion of the Eads Bridge.



STORED COAL IN DANGER FROM RIVER

Power-plant coal stocked on the bank of the Mississippi in St. Louis. Some of this pile had to be moved or it would have been liable to wash away.

ANOTHER VIEW OF THE STOCKPILE

Note the hole or bay washed in the bank. Beyond is the power plant, while the Eads Bridge is faintly visible in the distance.

It is understood that a small portion of this stored coal was lost through caving of the river bank. Steps were immediately taken, however, to move the coal thus endangered. The river stage at the time the photographs were taken, on April 16, was 35 ft. and it was thought that it had not yet attained its crest and might do still further damage.

Congressional Committees Hear Coal and Oil Compared as Fuel for Ships

THE relative merits of coal and oil as fuel for vessels was discussed in the hearings before the Senate Commerce Committee and the House Merchant Marine Committee in consideration of the ship subsidy bill. H. L. Ferguson, president of the Newport News Shipbuilding & Dry Dock Co., said there was a saving of from 7½ to 10 per cent in the use of oil over coal.

T. H. Rossbottom, manager of the U. S. Lines, said that if the cost of oil per ton were approximately the same as coal there would be a saving of 15 per cent in the use of oil over coal. The price of oil had been and was now higher than coal. His company operates both oil- and coal-burning vessels and finds more trouble with coal than oil. He testified that the cost of oil is $4 a ton and that of coal $2.75 a ton. There are no boiler repairs on oil steamers, he stated, as there is constant heat in the furnace, while in coal-burning ships there is a sudden contraction and expansion as the door of the furnace is open to feed coal. He also stated that the ship operator has less trouble operating a steamer using oil than coal, and that there is less deterioration of boilers and a smaller crew required. He also stated that oil firemen were of a higher type of men than those of coal-burning vessels.

Director of Research Merrill, of the Shipping Board, was not inclined to say that oil had an advantage over coal in propelling cargo ships. He quoted a steamer captain as saying that oil and coal were on a par. Of the Shipping Board fleet 75 per cent of the vessels burned oil, whereas only 10 per cent of the British fleet burned oil. He testified that greater steaming power can be obtained from Pocahontas coal than other coal, and that a ton of coal occupied 45 cu.ft. of space and a ton of oil 38 cu.ft. Coal-burning ships now obtain fuel at reasonable prices, he testified.

Mr. Merrill gave current coal and oil prices at various ports as follows, per ton:

	Coal	Oil		Coal	Oil
New York	$6.75	$8.38	Honolulu	$13.00	$12.21
Norfolk	5.50	8.38	Australia	8.25	....
Hamburg	11.38	15.18	Durban	9.18	....
Gibraltar	7.93	15.75	Bombay	11.40	45.10
River Plate	8.36	18.00	Naples	8.58	....
San Francisco	12.00	9.24	Brest-Thorp.	....	15.75
Manila	11.00	16.50	Baton Rouge-New Orleans	5.50	1.15

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

IMPROVED industrial conditions are gradually translating unemployment into employment, according to the U. S. Department of Labor industrial survey for the month ending April 30, 1922. "Despite a few disquieting industrial features," the department's announcement states, "America is surely righting herself. April recorded an upward movement with industrial lines broadening out, which will show increased activity in May.

"There was a pronounced increase in employment in iron and steel and their products, and in metal and metal products. Vehicles for land transportation recorded 10.4 per cent increase in employment over March. Employment increased in chemicals and their products; stone, clay, and glass products; and lumber and its finished products.

"Textiles and their products showed 7.6 per cent decrease in employment over March. There was a decrease in employment in food and kindred products, due to seasonal operations. Leather and its finished products, paper and printing, tobacco manufactures, and railroad repair shops all showed a slight decrease in employment.

"There is an expansive building construction program on. The demand for carpenters, bricklayers, plasterers and all classes of workmen engaged in the building trades is equal to the supply, and at some points is even greater than the supply. The optimistic attitude of the farmer is reflected in the unprecedented demand for high-class farm help."

This monthly survey is based on actual figures taken from the larger industrial payrolls of the country. The statistics on which its computations are based are gathered each month by the department's special agents in sixty-five principal industrial centers. In all, 1,428 firms each usually employing more than 500 workers, or a total of 1,600,000, are comprised in the survey. On April 30 these 1,428 firms had 11,875 more employees on their payrolls than they carried on March 31, an increase of 0.74 per cent.

Of the 65 cities, 40 report employment increases during April over March, with percentages of increase varying from 0.25 in Cincinnati, Ohio, to 16.8 in Chattanooga, Tenn. Twenty-four cities report employment decreases during April over March, the percentages of decrease being from 0.05 in Louisville, Ky., to 69.9 in Lawrence, Mass.

Middle West Nearing Normal

Employers generally express the opinion that conditions are nearing normalcy in the Middle West. Nearly all industries are taking on additional help. Building contractors are calling for carpenters, painters and other help. The iron and steel industries are gaining. Farm implement manufacturies are showing a decided revival in operations. Employment in the automotive industry is steadily increasing. The 19,000 clothing workers in Chicago suffered a reduction in their forces of 5.6 per cent. The coming of spring reduced the operations of the packers, but flour mills made quite a gain. Public improvements and farm activity are absorbing many unemployed.

INDUSTRIES REPORTING AN INCREASE IN EMPLOYMENT IN APRIL, 1922

Industries	Amt of Inc.	P c Inc.	Weight*
Vehicles for land transportation	20,556	10.4	13.8
Stone, clay and glass	1,166	7.8	1
Iron, steel and their products	20,562	5.7	23.5
Metal and metal products	1,947	2.1	5.5
Chemicals and allied products	1,328	1.8	4.6
Lumber and its manufacture	127	.5	1.5
Total	45,686		

INDUSTRIES REPORTING A DECREASE IN EMPLOYMENT IN APRIL, 1922

Industries	Amt of Dec.	P c Dec.	Weight*
Leather and its finished products	4,340	6.9	3.1
Textiles and their products	19,793	7.6	14.2
Liquor and beverages	64	7.3	.05
Food and kindred products	5,204	3.96	7.5
Paper and printing	947	1.9	3.06
Miscellaneous industries	3,013	1.1	16.4
Tobacco manufacturers	133	.3	1.9
Railroad repair shops	995	.31	3.8
Total	33,711		

*Per cent employed April 30 to total reported employed in 14 groups.

Mid-Atlantic Improvement General

Industrial gains in operations in the Middle Atlantic district during recent months extending to practically all lines of industries, together with the gradual increase in employment, have given encouragement. A consensus of opinion indicates that the present upward trend has characteristics of permanency. Considerable activity is evident in the building industry, with increased gains in employment in all building trades. The iron and steel industry, metals and machinery and some branches of the textile trades show a gradual improvement. Curtailment of forces in the railroad industry has been made at some points. Additional gains have been made in the number of workers employed; in fact there has been an encouraging steady decrease in unemployment during the past two months.

New England Still Optimistic

An optimistic feeling still prevails in the New England district as to improvement in the near future. Unemployment and part-time employment affects all lines except the building trades, which showed marked improvement during the past month. There has been some improvement in the metal trades. Unemployment is widespread in textiles; besides many plants being closed, part time is prevalent in those that are operating. Shoe factories are now running full time on next season's business.

South Central Idleness Drops

Actual payroll data from the principal cities in the South Central district indicate considerable increase in employment. The textile and lumber industries show a remarkable improvement. Cotton planting is progressing slowly, with indications of an increase of acreage. From an employment viewpoint the lumber situation is more satisfactory. There are less unemployed men around the sawmill villages than there has been for some time. The demand for lumber is good and indications point to a heavy demand for Southern pine this season, encouraging manufacturers to increase production.

South Atlantic Gains Continue

A gradual increase in employment is shown in all industrial lines in the South Atlantic district. Seventeen railroads report a gain of 9,176 in the number of employees during March. Increased building construction is helping to relieve the housing shortage and giving considerable employment to building trades. Textile mills show a slight decrease in the number of employees. A substantial increase in employment is to be noted in the chemical industry.

Keep Bins Well Stocked with Coal

(Editorial from Electrical World, May 6, 1922)

ALTHOUGH more than five weeks have elapsed since the coal miners went on strike, we have yet to hear of an electric public utility which has been handicapped through lack of coal. Indeed, the demand for coal has been so small that many non-union mines which would normally be in operation are shut down for want of orders. Under such circumstances one need not refrain from buying coal for immediate consumption or for storage if it is obtainable at a reasonable price. There is no necessity for purchasing more than is needed, especially if lower prices are expected; but if reserves are permitted to run too low, it may be difficult to replenish them quickly when the pinch comes. Just now coal production ought to be encouraged, provided, of course, that the price is right. The electrical industry should avoid, if possible, bringing on any crisis in coal supply. A good load factor is as essential to a coal mine and a railroad as it is to an electric light plant, and a steady movement of coal to market is most desirable. The fact that the public has not been inconvenienced in its supply of electricity during the coal strike speaks well for the public utilities. There is no telling how long the strike will last, however, and as a matter of precaution coal stocks should be replenished gradually and discreetly.

Freight Loadings Increase 7,375 Cars; Coal Movement Gains Slightly

FREIGHT loadings for the week ended April 22 amounted to 714,088 cars, an increase of 7,375 cars compared with the previous week. This compares with 704,632 cars loaded for the same week of 1921, but is a decrease of 3,689 from the 717,777 cars loaded during the corresponding week of 1920.

Increases over the week before were reported in the loading of all commodities, including coal, with the exception of coke and merchandise and miscellaneous freight. Coal loadings totaled 63,445 cars, or 594 more than the preceding week, but a decrease of 74,944 below the same week in 1921. Coke loadings amounted to 7,609 cars, a decrease of 463 cars from the week before, but 2,927 above the corresponding week last year, while the shipments of merchandise freight amounted to 516,020 cars, 2,828 less than the week before.

Freight cars idle because of business conditions totaled 529,884 on April 23, compared with 491,513 on April 15, or an increase of 38,371. Surplus coal cars totaled 229,892, an increase since April 15 of 41,974, while an increase within that period of 827 was reported for coke cars, which totaled 3,669.

Congressman Gootykoontz Defends Operators

A STRONG defense of coal operators from charges for responsibility for the strike and existing conditions in the industry was made by Representative Gootykoontz, of West Virginia, in a speech in the House of Representatives. He particularly directed his remarks to answering propaganda which he said was being circulated in support of the theory of government ownership of coal mines. He denounced the propaganda as slanderous in character and of the most pronounced socialistic type. He denied charges that coal operators are profiteers and disregard the public welfare.

Referring to alleged overdevelopment of the coal industry, Mr. Goodykoontz said this was due to the augmented production of coal caused by the war and referred to the United States having fixed coal prices for the benefit of the Allies during the war. He estimated the value of the coal mines at $4,000,000,000 and doubted whether they could be operated as economically by the government as by private industry.

Discussing the strike, Mr. Goodykoontz, after reviewing the low state of the industry due to lack of demand and low prices, said the miner would have been willing to work for a lower wage if assured regular employment and that if the operators had been able to obtain a reasonable price for coal the strike would not have occurred. He praised the business type of men in the coal industry and said neither the operators nor miners could be criticized for existing conditions.

Carnegie Steel Company Will Build Huge Byproduct Coke Plant

A SECOND byproduct coke-oven plant to be erected by the Carnegie Steel Co. at Clairton, Pa., will cost from $30,000,000 to $35,000,000, according to an announcement by the company May 3. It will double the capacity of the oven already in blast there and will cover an area of sixty-five acres.

The byproduct plant at Clairton now comprises 7,768 ovens of the Koppers type, with a capacity of twelve tons of coal to the charge. These ovens are arranged in twelve batteries of sixty-four each. The new plant will comprise fourteen batteries with sixty-four each, giving the company 1,664 ovens with a total production of 29,952 tons of coal charged a day, or an annual production of about 11,000,000 tons of coke.

The construction of what will be the largest byproduct coke plant in the world is the result of conditions brought about by the bituminous coal strike and the closing of many mines and coke plants in the Connellsville and lower Connellsville regions.

With transportation facilities adjusted to assure adequate supplies of coal, the byproduct ovens can turn out enough coke for all the furnaces owned by the United States Steel Corporation in the Pittsburgh district.

Living Costs Increased During March

LIVING costs registered an increase during March, according to reports to the Department of Labor. Of 30 principal cities reporting so far, 21 show an increase ranging up to 2 per cent, and nine a decrease of 1 per cent for that month.

Cities showing the largest increase are Kansas City, Boston, Cincinnati, Cleveland, Detroit, Minneapolis, Portland, Me., and Washington. New York, Philadelphia, Chicago, Pittsburgh, St. Paul and Salt Lake City showed increases of less than 1 per cent.

Among cities reporting a decrease of 1 per cent were Baltimore, Houston, St Louis and Scranton.

For the year period ended April 15, Bureau of Labor statistics show, food costs declined up to 13 per cent.

THERE WERE ONLY EIGHT BIDS received on May 1 at the Army Supply headquarters, South Brooklyn, for furnishing and delivering to various stations 7,000 tons of run-of-mine bituminous coal, time of delivery up to June 30. Because of the quotations received, ranging from $2.95 to $4, f.o.b. mines, it was thought the bids would be re-advertised.

GROUP MEETING OF
NATURAL RESOURCES PRODUCTION DEPARTMENT
U. S. CHAMBER OF COMMERCE

ANNUAL MEETING MAY 16-18, 1922

Afternoon of May 16

The Coal Industry

"The Story of Coal"—Moving picture prepared by U. S. Bureau of Mines.

"The Industry and Government Regulation"—Address by Howard Sutherland, Senator from West Virginia.

Addresses with discussion on following topics:

"Improved Selling Methods"—W. R. Coyle, vice-president, Weston Dodson & Co., Bethlehem, Pa.; president, American Wholesale Coal Association.

"The Transportation Problems"—E. M. Poston, president, New York Coal Co., Columbus, Ohio.

"The Coal Strike and How to Prevent a Recurrence"—Eugene McAuliffe, president, Union Colliery Co., St. Louis, Missouri.

Fifth Week of the Coal Strike

EDITORIAL REVIEW

FIVE weeks with all the union coal mines and a portion of the non-union mines closed down by strike, the country eating into its sixty-odd million ton storage pile at the rate of 4,000,000 tons per week, and non-union mines producing another 4,000,000 tons per week, prices going up, comparatively little violence in the coal fields, and the country generally apathetic on the subject summarizes the situation in the early part of the sixth week of the strike.

There is as yet no real sign of any development that would forecast the termination of this controversy. Stories that President Harding and the administration are studying the situation and are working on a plan are accompanied by assurance that the plan is something to prevent future strikes and not for the settlement of this one. Representative Bland has finally pushed his fact-finding coal bill into a position before the House, where of course it must take its turn on the calendar, the Nolan committee having reported it favorably.

Meanwhile the non-union mines continue to pour forth coal as fast as consumers demand it. The efforts of the union to close down the non-union fields of Pennsylvania appear to have reached their climax. The steel companies, previously dependent on Connellsville and other coal in this region, are having no difficulty in buying adequate supplies south of the Potomac River. The only problem left now is the transportation of a flood of Southern coal by rail northward through the "gateways to the South."

Virginia, eastern Kentucky and the smokeless and high-volatile fields of southern West Virginia are running practically full time. Western Kentucky, a union field but operating under a contract not yet expired, is meeting the local demand from Chicago and the Midwest.

Lewis Presents Abortive Resolution To Reduce Price of Anthracite

JOINT Recommendation for Reducing the Price of Anthracite was the title applied to a document presented by John Lewis on May 3 to the joint conference of anthracite operators and mine workers in New York. So clearly did the miners know that what they were proposing in that joint recommendation would be vetoed by the operators that the statement prepared by the miners accompanying the recommendation and given to the press in advance of the meeting closed with the following words: "the Joint Reolution which the anthracite operators refused to sign is as follows."

This recommendation, the operators' answer to which is in a following section, contained among the seven whereases, citation of the fact that the price of anthracite to the consumer should be reduced, capital should have a fair return and labor a just and reasonable wage; that freight rates are comparatively higher than on bituminous coal and that needless agencies of distribution exist for the purpose of trafficking in and adding unwarranted profit in the distribution of anthracite. The resolution, which it was proposed the anthracite operators jointly sign with the mine workers, provided:

> First, that an investigation at once be made by the Interstate Commerce Commission of freight rates charged for the transportation of anthracite coal, with the end in view of ordering a reduction of such rates if they are found to be unjust and unreasonable.
>
> Second, that the Federal Trade Commission at once investigate all agencies which have been established for the handling and sale of anthracite coal, extending from the mines to the consumers, with the end in view of recommending measures of relief from unwarranted costs and profits.
>
> Third, that a copy of these resolutions be transmitted to the Interstate Commerce Commission and the Federal Trade Commission with the request that they at once institute such investigations and take such action as they may deem necessary to relieve the consumer of anthracite coal from any unjust or unreasonable costs which may be found to exist.

Miners' Resolution Needlessly Complicates Situation, Is Belief of Anthracite Operators

THE attitude of the anthracite operators respecting the resolution offered by the miners' representatives calling for an investigation by the Interstate Commerce Commission of freight rates and by the Federal Trade Commission of the marketing of coal, was expressed in a statement given out on May 3, 1922. It follows:

"As to freight rates which have been established by the Interstate Commerce Commission the subject has been under investigation for many months; representatives of anthracite producers have appeared before the commission and advocated reductions. Everyone is opposed to 'unjust and unreasonable rates' and if any such rates are in effect the commission may be depended upon to change them.

"The Federal Trade Commission is empowered by law to investigate any situation within its jurisdiction and apply corrective measures. Anthracite producers, the general impression to the contrary notwithstanding, have not only never put any obstacles in the way of the Trade Commission obtaining any information it sought in regard to the hard-coal industry but have placed their books and other records at the disposal of the authorized agents of the commission, which has already made exhaustive reports on the anthracite situation.

"For these reasons the operators have not thought it desirable to join with the miners' representatives in resolutions which tend to confuse rather than clarify the situation. The matters dealt with in the proposed resolutions are not within the jurisdiction of the joint committee of miners and operators constituted to negotiate a new contract covering wages and working conditions. To concern itself with anything else can only delay and complicate solution of the issues with which it is dealing, namely, the formulation of a fair wage scale and reasonable working conditions. The operators decline to be diverted from this task by proposals which, whether desirable or not, have no bearing upon the task of providing a basis for the resumption of anthracite production."

Warriner Defends Anthracite Operators' Delay in Naming Wage-Reduction Demands

AT THE conclusion of the conference of the joint wage subcommittee of anthracite operators and miners held in New York City May 5, at which time an adjournment was taken until Monday, May 8, Samuel D. Warriner gave out a statement defending the delay on the part of the operators in making known their demands as regards wage reduction. In it Mr. Warriner said:

"It would have been a very simple matter at the outset for us to tell the miners' representatives what we thought the wage reduction should be. But this necessarily would have been a maximum figure to cover all contingencies, known and unknown. We were and are unwilling to do this. We do not intend to put out a 'trading proposition.'

"Furthermore, we have thought it our duty to our employees to listen to and carefully consider their side of the case, and to give them an equal chance to get our viewpoint. We believe that real progress has been made toward an understanding, and that we are approaching a point where there can be a contact of minds on the fundamental problems involved. There is already a much better comprehension of the fact that for everyone in the anthracite region as well as for the mine worker it is better to have regular employment at good wages than scant and irregular employment at overinflated wages.

"Our problem is to make the wage reduction not as much but as little as possible, and still keep the mines in operation. That is the problem with which we are grappling and of which we expect to find a solution fair to all. But this solution cannot be brought about hurriedly nor until those concerned have come to an understanding of facts and conditions which neither miners nor operators can ignore."

Warriner Disputes Lewis Statements At Hearing on Bland Bills

THE anthracite operators did not appear before the House Committee on Labor when the various proposals of Representative Bland were being considered. There was, however, considerable testimony recorded on the anthracite situation from the standpoint of the mine workers, and in a letter dated April 29, 1922, S. D. Warriner, chairman of the Policy Committee of the Anthracite Operators, addressed a letter to Representative Nolan, chairman of the House Committee on Labor, challenging some of the statements of John L. Lewis, president of the United Mine Workers. Mr. Warriner's letter follows:

In his testimony before your committee, John L. Lewis, president of the United Mine Workers of America, made certain statements regarding present conditions in the anthracite region which I cannot permit to remain on the record unchallenged.

On page 194 of the record, "Hearings before the Committee on Labor," on H. R. 11022, occurs the following statement by Mr. Lewis:

"The mine workers wish to remain at work in the mines, but existing circumstances would not permit them to do so. The trouble, so far, in the anthracite region is that the operators are not willing to allow the mine workers to continue at work during the progress of the negotiations, and as they have accumulated considerable stocks of coal, and as warm weather is about here, there will be no great hardship from the suspension except to the poor devil of a mine worker who finds himself out of a job, and to the railroad worker who may be laid off after the surplus stocks of coal are carried to the market."

This statement is distinctly at variance with the facts. In accepting the invitation of Mr. Lewis to meet the representatives of their employees for the purpose of negotiating a new wage agreement, the General Policies Committee of the Anthracite Operators expressed regret that the date for the meeting fixed by Mr. Lewis, namely March 15th, approached so closely that of the termination of the existing agreement, as it would not permit the completion of the negotiations.

They agreed, however, to meet with the miners' representatives and have been in almost continuous conference with them through the wage negotiating committee since March 15. In view of the fact that negotiations were in progress and that there were possibilities of an agreement being reached, which even if reached after April 1, could have been made retroactive to that date, the calling of the suspension by Mr. Lewis came as a distinct surprise to the anthracite operators. Their representatives on the negotiating committee protested vigorously on what they considered a flagrant breach of faith on the part of Mr. Lewis and his associates, but without avail. The anthracite operators were absolutely without any responsibility for the calling of the suspension.

The statement that the operators had accumulated considerable stocks of coal falls to the ground when it is known that approximately 90 per cent of the coal in storage consisted of pea and buckwheat sizes which had backed up in the storage yard simply because of lack of demand for these sizes in the late months of 1921.

Mr. Lewis in the paragraph following the one quoted says further: "In the anthracite field the operators are carrying out their agreements to enter into conference, but say there must be a suspension until it can be determined when the wage rates for the ensuing term are to be fixed." The anthracite operators never made nor contemplated making any such utterance.

On page 199 of the record Mr. Lewis is quoted as saying:

"An investigation made recently throughout the anthracite regions outside of Scranton reveals the fact that the decline in prices in these regions has been distinctly less than it has been in Scranton, and therefore considerably less than throughout the United States as a whole. This investigation has been only partially completed, but so far the strong probability is that prices in the anthracite regions have even risen since June, 1920, at which time they reached the peak, both in Scranton and throughout the United States generally."

What the report of the Bureau of Labor Statistics really said was: "During the month from Feb. 15 to March 15 there were decreases [in the retail cost of food] in Detroit, Philadelphia, Rochester, Salt Lake City and Scranton of 3 per cent; in Norfolk and San Francisco of 2 per cent, and in Chicago, Cincinnati, Columbus, Little Rock, Louisville, Mobile, Minneapolis, New Orleans and St. Paul of 1 per cent." Scranton being included in the group of cities that reported the largest decrease.

Watchful Waiting at Washington

THE beginning of the second month of the strike found each contender well dug in, prepared to settle down for an indefinite period of trench warfare. Despite the fact that a score of coal specialists in Washington are constantly on the watch for any sign which may have significance, they could point to no important change in the situation at the end of the first week in May. The worst feature is that no one sees a prospect of anything more than a makeshift peace. Secretary Hoover admits that something more fundamental must be done than try to patch up the present quarrel. That is as far as he is willing to go at this time by way of explanation.

Looking back over the first month of the strike, it is apparent that the mine workers are no closer to their objectives than they were on April 1. At the same time they have been able to accomplish more than anyone thought, before the strike. One official says the odds were ten to one against the mine workers when the strike began, but that the strikers have decreased the odds against them until, in his opinion, they now stand six to one. Operators, however, see favorable signs. The tension seems to be getting on the miners' nerves, as indicated by some rioting, they point out. The operators claim gains in central Pennsylvania, but as yet this has not been reflected in increases of tonnage.

One of the significant features of the strike is the absence of legal interference. This is particularly the case in Pennsylvania, where no injunctions have been granted. Observers in Washington are wondering if this indicates a changing attitude on the part of the judiciary with respect to the use of the injunction weapon.

Slowly over the course of years a valuable asset is being built up by the government in the shape of fundamental knowledge as to the coal industry. During the past month material additions have been made to this knowledge. It is emphasizing more and more the unbridgeable character of the chasm which separates the coal-mining industry north of the Ohio River from that which lies south of it. The union territory and the non-union fields possess all the elements of opposition that are possessed by the positive and negative poles of a battery. Anything fundamental seems to require agreements on a national scale. Patently there must be radical changes before anything like general accord can be effected between such radically differing entities. P. W.

Scores Operators for Withholding Costs; Labor Committee Got Useful Data

IN a speech in the House of Representatives on May 2, reviewing recent consideration of the coal situation by the Labor Committee, of which he is a member, Representative Bland, of Indiana, sharply attacked the coal operators for refusing to divulge production costs, and predicted that eventually Congress would take some action looking to ascertainment of facts in the coal industry. He argued that his proposed bill creating a fact-finding agency is constitutional. Mr. Bland stated that while the committee has been unable to get the operators and miners together on a new wage agreement, its labors have been "helpful in clearing up many points of misunderstanding and in obtaining a great amount of information which is to prove of great value in the solution of the problem which we hope will come in the near future."

Mr. Bland said that "President Harding on more than one occasion expressed his disapproval at the obstinate attitude on the part of some in refusing to carry out the agreement" and that Secretary of Labor Davis has gone the limit in trying to get the contending forces together. He referred to the "open breach of faith and open defiance to public and official opinion on the part of the operators." He admitted that John L. Lewis "made demands which he himself probably realized his organization could not hope to obtain in a conference with the operators" and that his organization "would be required to recede from a part of its demands."

Mr. Bland said that it was remarkable that no government fact-finding agency was able to give the committee in its hearings any information on more than 2,500 out of the 11,000 coal mines of the country and that for the most part the information was restricted to two or three hundred mines.

"Government agencies, in their attempts to gain information, with a few minor exceptions, were required to take and did take such information only as the operators through their various associations wished to disclose," he declared. "On more than one occasion operators brazenly refused to give the committee the cost of production or the selling price of coal at their mines. Some of the mines where the high and outrageous prices were demanded and obtained were owned by those who refused to give information on cost production. The National Coal Association, through its vice-president, Mr. Morrow, came forward with its padded report. There is no agency of the government that has the information or can obtain it as to what it cost during the last year for a well-equipped, efficient mine to produce a ton of coal. The government not only does not have it but the right to obtain it is denied by the coal operator. He says it is an unwarranted interference with his private business."

Mr. Bland told the House why the operator "does not want to give the price it costs him to produce a ton of coal." "At times when the pinch comes and the public must have coal he demands an exorbitant price for it and he does not want the country to know what it costs him to produce it because he realizes that in many instances the public would feel outraged and that some retaliatory measures would be resorted to," said Mr. Bland.

Mr. Bland said it is hoped by those who are thinking on the coal problem that a remedy may be found for the evils in the industry, and that it may be stabilized so that there will be steady production at all seasons, competition will reign and cheap fuel be had, with a good fair profit to the operator and a good wage and steady work for the employee.

Mr. Bland said the coal industry was overdeveloped, there being a third too many mines and miners. Because of the seasonal demand for coal the operators sold to whoever paid the highest price, which was true of farmers and other producers. He advocated greater production of coal in summer, reduced freights in summer, storage of coal by railroads by Interstate Commerce Commission order, and storage by the consumer.

Mr. Bland opposed a cut in miners' wakes as a means of reducing the price of coal and referred to steel and railroad interests owning coal mines which were fighting the mine union.

Analyzing his proposed fact-finding agency Mr. Bland said that in addition to obtaining data as to cost of producing coal it would open up the books of the mine unions and require them to show what they spend their money for, and also would delve into the coffers of those who are prosecuting claims against the government for coal sold to the navy at $16 per ton. He predicted that if passed, his bill forbidding coal shipments by companies refusing to furnish the government cost of production information would be sustained by the courts.

Fact-Finding Bill Is Favorably Reported; Amended to Compel Presence of Witnesses

A FAVORABLE report has been ordered by the House Committe on Labor on the bill of Representative Bland to establish a coal investigation agency to operate for two years in an attempt to frame a groundwork on which Congress may legislate to stabilize the coal industry. Effort will be made to have the bill passed by the House during this session. The bill as reported was modified in a number of respects by the committee. It provides in more detail for the selection of the representatives making up the agency of ten members, who are to include the directors of the Geological Survey, Bureau of Mines and Bureau of the Census, the Commissioner of Labor Statistics and two representatives each of the public, the miners and the operators.

The objects of the bill in addition to those described in *Coal Age* of April 27, page 704, are to provide information for Congress as a basis for legislation along the following lines:

To settle industrial disputes in and to prevent the overdevelopment of the coal industry.

To stabilize such industry and levy taxes in respect thereto.

To regulate commerce in coal among the several states and with foreign nations.

To provide a coal supply for the maintenance of the navy and the merchant marine.

To protect the coal supply for the District of Columbia and forts, magazines, arsenals, dockyards and other public buildings of the United States outside of the District of Columbia.

For these purposes the agency is authorized and directed by the bill to require and obtain from any person such data, information and reports as it deems desirable for such purpose, including among other matters, data, information and reports as to the following:

Supply, production, distribution, storage and consumption of coal and its grading and economic utilization.

As to the relations between operators of coal mines and washeries and their employees with particular reference to wages, hours of labor and working conditions.

As to the ownership and value of coal lands and of property of operators or owners which is of use in the operation of coal mines or washeries.

An amendment to the original Bland bill incorporated by the committee would permit the agency to require by subpœna the attendance of any witness and the production of books or other evidence "from any place in the United States."

The bill also provides that the agency may invoke the aid of any U. S. District Court in obtaining compliance with its subpœnas. The court may order a witness to comply with the requirements of a subpœna and to give evidence touching the matter in question. A new paragraph provides that if the court makes such order it may also fix in the order the time for compliance therewith and enjoin the witness from shipping or receiving from shipment in commerce among the states or with foreign nations any coal after the time so fixed and before his obedience to the order. The bill carries a penalty of $5,000 or imprisonment for a year or both for failure to comply with orders of the agency. It is also stipulated that if any provision of the act or the application thereof to any person or circumstance is held invalid, the invalidity of the remainder of the act and of the application of such provision to other persons and circumstances shall not be affected thereby. The bill appropriates $50,000 for expenses of the agency for the year ending June 30, 1923.

Keeney Says Union Miners of West Virginia Will Not Make Separate Agreement

THAT the union miners of West Virginia will make no separate peace or agreement with the operators of West Virginia was the announcement made on April 26 at Charles Town, where Keeney and other officials of the United Mine Workers are undergoing trial charged with treason and other crimes. Keeney in making his announcement said that no matter what action might be taken in other states the members of District 17 and District 29 will stand by the International organization. This was the assurance given John L. Lewis, Keeney said, at a conference between Lewis and the officials of District 17 and District 29.

Lewis discussed with John H. Sprouse, president, and John Gatherum and other officials of District 29 the temporary injunction against organization activities in the Winding Gulf and other non-union fields, but no statement was made as to the nature of the discussion nor what steps the officials proposed to take. Sprouse and Gatherum made the trip from Beckley for the express purpose of consulting Lewis.

Illinois Prepares for Settlement; Peace Prevails in Most Mining Fields

IF THE miners of Illinois were to ask tomorrow morning for a wage conference with Illinois operators, the operators would be ready in five minutes to lay down their idea of a wage agreement. The finishing touches to a proposed agreement covering a hundred and one conditions that will have to be determined upon before work resumes, were applied at an operators' meeting in Chicago, May 4. Then the document and all that appertains thereto was sealed up to await the time when it can be spread on a conference table.

While no definite move toward such a conference has been made, it may be expected at any time in the near future, for there is no denying that the Illinois miners are getting restive at the delay and the deadlock. But even after a conference shall have been asked there remains a long, hard road to travel before any sort of settlement can be made. Many coal men believe that even should Illinois be the first to start conferring, it may be the last to get a settlement. The recent prophecy of a Kentucky coal-mining company's president that western Pennsylvania will have a new wage scale in effect within 45 days and that settlements by states will move westward from there, wins nods of acquiescence hereabouts from men who once thought Illinois would settle first.

There is peace throughout the Illinois and Indiana mining fields. No serious disturbances have occurred, and in many mines a few members of the miners' union are doing repair and maintenance work at wages far under the old scale and without interference from union headquarters.

Utah's Tense Mine Situation Is Like Keg of Powder with a Short Trail Laid

UTAH, which hardly knew it had a coal miners' strike until a week ago, watches the bulletins fearfully now. The situation is tense and as ready for an explosion as a keg of gunpowder with a short powder trail ready for a spark. Applications from various mining fields have come to Governor Mabey for troops to prevent another outbreak such as that of last week when 500 or more shots were fired around promiscuously in Carbon County. About 50 special deputy sheriffs were on duty at the end of last week in Winterquarters and Scofield and troops were in readiness for a rush to a riot.

M. P. Bales, president of the Utah Federation of Labor, has written the Governor warning him that there will be a general strike of organized labor throughout the entire state if any troops are sent out and martial law declared. The Governor replied that he would pay no attention to such threats. If the occasion demands, troops will be used. Carpenters' organizations also have protested to the Governor that use of the militia in this case is desired by big industry and that the scheme should be thwarted.

When the 50 special deputies were sent out a few days ago, Sheriff Kelter warned Commissioner Gibson of Carbon County that no arrests or searches for arms should be made for fear of starting trouble unnecessarily.

Mine owners in that county have sent a petition to the County Commissioners saying in part: "These two localities [Scofield and Winterquarters] are filled with a lawless element, who in defiance of the law are armed and who are now interfering by force and intimidation with the rights of citizens resident within said districts."

Commissioner Knerr of the State Industrial Commission, a former labor leader, is in Carbon County as the personal representative of Governor Mabey. Mr. Knerr has addressed several meetings in which he has urged the men not to resort to violence.

Small Disturbances Occur in Colorado Mining Regions

PRACTICALLY no changes have been reported in Colorado strike conditions in Berwind canyon, Delagua, Aguilar and Trinidad districts. All Colorado Fuel & Iron Co. mines in the Walsenburg district are running under normal conditions, according to company officials. Small forces are reported working in the Canon City district at the following camps: Rockvale, Fremont, Nonac, Emerald, Chandler, Radiant and Wolf Park.

Colorado state rangers are investigating the attempted wrecking of coal cars drawn over the cut back of the Caddell mine, midway between Walsenburg and Turner, Col. Fire recently destroyed a trestle railroad bridge southeast of Turner camp. Adjutant General P. J. Hamrock, head of the ranger force, says that fire was incendiary.

Mines Bureau Seeks Data on Coal Storage

A STUDY of coal storage has been undertaken by the Bureau of Mines, in conjunction with the Department of Commerce, in which many of our readers will be interested and from the results of which the larger industrial users of coal and the railroads should gain much practical and useful information.

F. R. Wadleigh, in charge of this study for both bureaus, desires to obtain as much data as possible on the subject and has sent the following letter to a number of the larger users of coal.

Coal Age urges any of its readers who are interested in the subject to write Mr. Wadleigh, giving him what data they have. A letter in care of the Bureau of Mines, Washington, D. C., will reach him.

> The obvious importance of a clear understanding today of all elements involved in the storage of coal, for industrial and other purposes, has led the Bureau of Mines, in conjunction with the Department of Commerce, to undertake an investigation of the question, in which your co-operation and advice is earnestly requested.
>
> While there has been much agitation of the possibilities of coal storage in the way of giving more regular mining and movement of coal, but little exact information is available, especially regarding costs of handling and transportation in and out of storage, as well as of the investment, fixed charges, etc., involved.
>
> The Bureau requests therefore that you will, at your convenience, give it the benefit of your views and conclusions on the various items given below, calling attention particularly to the value of exact data and actual working costs. The various items to be covered are as follows:
>
> - Method of storage.
>   - Under water or not.
>   - Closed sheds or in the open.
>   - Kind of floor or ground.
> - Location of storage with reference to point where coal is to be used.
> - Quantity stored—maximum; average.
> - Spontaneous combustion—methods of preventing.
> - Handling fires, method of.
> - Devices used for observing temperature and inspection.
> - Danger point as regards temperature.
> - Deterioration in sizes and also in heating value in stored coal.
> - In your practice what tonnage can be stored per acre of available space?
> - Depth of pile, maximum allowed.
> - Kind of coal stored.
>   - District from or trade name.
>   - Size stored.
>   - Is coal screened before storing?
>   - How long coal must be stored.
> - Best time of year to store.
> - Cost of storage plant and cost of maintenance.
> - Cost of handling in and out of storage.
>   - Transportation to pile.
>   - Transportation from pile to point of use.
> - Effect of climate on stored coal, if any.
> - Costs of unloading and releasing.
> - Method of handling in and out of storage.
> - Cost of investment and fixed charges.
>
> Compliance with this request will be greatly appreciated and any data furnished will, of course, be treated as confidential, if so desired.

March Railroad Earnings $52,736,492 More Than During That Month Last Year

REPORTS from 197 Class 1 railroads, representing a mileage of 233,000, to the Interstate Commerce Commission show that the net operating income in March of those roads totaled $83,374,299, compared with $30,637,807 during the same month one year ago.

The operating revenues in March of the 197 roads totaled $472,689,165, which was an increase of 3½ per cent over those for the same roads in March, 1921, while their operating expenses amounted to $359,328,983, or a decrease of 9.7 per cent compared with that month last year.

Eighty-five roads in the Eastern district had operating revenues totaling $242,243,780, an increase of 10.2 per cent over March one year ago, while their operating expenses were $180,982,699, or 7.6 per cent less than those for the same month last year. The net operating income for those 85 roads amounted to $47,801,191, compared with $11,755,351 in March, 1921.

Reports for 31 railroads in the Southern district showed that their operating revenues amounted to $62,009,728 in March, or 2½ per cent greater than during that month one year ago, while their operating expenses totaled $47,137,912 which was 11.4 per cent below that of one year ago. The net operating income for the 31 roads amounted to $11,093,391, compared with $4,016,643 in March, 1921.

Reports from 81 roads in the Western district on file show their operating revenues were $168,435,657, a reduction of

4.4 per cent compared with March, one year ago. The operating expenses of those 81 roads totaled $131,208,372, or 11.8 per cent below the same month in 1921. The net operating income of those roads amounted to $24,479,714, compared with $14,865,813 in March one year ago.

U. S. Foreign Trade Nearer Normal Than That of Principal Competitors

IN ORDER to correct much popular misapprehension and conflicting opinion regarding the present condition of our foreign trade Herbert Hoover, Secretary of Commerce, calls attention to a few fundamental factors in the situation.

"It should be pointed out, in the first place," says Mr. Hoover, "that in order to form a correct opinion of the volume of our foreign trade we must take a pre-war year as a basis of comparison. The tremendous increase in our foreign trade during the war could not have taken place under normal conditions, and therefore should not be taken as a starting point in an estimate of our present situation. As a matter of fact, when we consider the diminished purchasing capacity of the civilized world, caused by the war, we are not sure whether we are even justified in adding to our pre-war level the average pre-war normal increase to cover the period since the outbreak of the war. While this reservation may seem superfluous, there is reason to believe that it has not been sufficiently emphasized in some of the popular discussions of our foreign trade.

"On the basis of a pre-war comparison we find, as will be seen from the following table, compiled from official figures, that the foreign trade of the United States is nearer normal than the trade of the United Kingdom, France or Germany, which are our principal competitors. While the figures in the table are only approximately comparable, owing to the fluctuations in price level, it is believed that they are sufficiently correct to indicate the relative advantage of the United States in foreign trade.

"If the trade of various countries were analyzed by commodities instead of values they would still show somewhat the same proportion. In other words, the trade of the United States, even in times of great depression, is higher than our pre-war level. During the last few months there has been a distinct revival in trade from the low point, and I am confident that we have little reason to accept the pessimistic view of our foreign trade future taken by many students of the question. Our trade has shifted somewhat as to commodities owing to the changed economic currents due to the war, but when all is said and done the remarkable fact stands out that we have held on."

FOREIGN TRADE OF THE UNITED STATES, GREAT BRITAIN, FRANCE AND GERMANY BEFORE AND AFTER THE WAR[1]

	Imports			Exports		
Countries	1913	1921	Ratio of 1921 to 1913	1913	1921	Ratio of 1921 to 1913
United States	$1,893,900	$2,509,000	133	$2,364,500	$4,485,100	191
United Kingdom	3,741,048	4,182,713	112	3,089,353	3,118,686	101
France	1,625,317	1,755,633	108	1,327,082	1,606,870	121
Germany[2]	2,563,185	1,062,684	41	2,403,142	858,292	36

TOTAL TRADE

	1913	1921	Ratio of 1921 to 1913
United States	$4,258,400	$6,994,100	164
United Kingdom	6,830,401	7,301,399	107
France	2,953,199	3,362,503	114
Germany[2]	4,966,327	1,920,976	39

[1] All figures, except ratios, are given in thousands. [2] Figures estimated on an eight-month basis.

Engineers Ratify Alliance with Miners

AT a meeting with Warren S. Stone, president, held in Cleveland, Saturday, May 6, the Advisory Board of the Brotherhood of Locomotive Engineers ratified the joint resolution adopted in Chicago on Feb. 22 at a conference of representatives of union coal miners and railway unions for a closer alliance between miners and the sixteen leading railroad labor organizations.

The resolution declares for closer co-operation of forces to more effectively protect the interests of those engaged in those industries and to obtain adequate compensation for service rendered. The plan is to become operative when ratified by the constitutional authorities of each of the associated organizations.

The engineers are the first of the "Big Four" brotherhoods to ratify the agreement. The Order of Railway Conductors will take action during their triennial convention now in session in Cleveland and the Brotherhood of Railroad Trainmen, meeting in triennial convention now at Toronto, and the Brotherhood of Firemen and Enginemen, also now holding their triennial convention in Houston, Texas, will consider the agreement.

Several of the railroad unions outside of the brotherhoods and the United Mine Workers of America have already ratified the agreement.

Tilts Are Numerous, Progress Is Slow, In Blizzard Treason Trial

DURING the last week progress was slow in the trial in Circuit Court at Charles Town, W. Va., of William Blizzard for treason in connection with the armed march of miners into Logan County last summer. Heated passages between witnesses for the state and counsel for the defense were frequent, the miners' attorneys putting witnesses through a searching cross-examination.

Use of union funds to equip and supply the marchers, pay for automobile trips after ammunition and for other purposes furthering the aims of the expedition and the individual experiences of some of the marchers made up much of the testimony on May 2. Contribution of $1,695 from the funds of one local union to various men, and supposed to have been for the purpose of the march, was shown by putting the cancelled checks in evidence. Oat Dickens, treasurer of the local at Montcoal last year, produced the checks and with them the orders on which he based his authority to write them.

That the marching miners last August and September were far from blind to the existence of martial law in Mingo County was indicated May 3 in testimony by Jim King, who said he attended a mine local meeting in August, when Savoy Holt exclaimed: "To hell with martial law in Mingo County! We had martial law on Paint Creek and we licked it there, and we'll lick it over here. We'll wipe out martial law in Mingo County!"

To this was added the testimony of J. N. Stone, who said he heard marchers declare they were going to Charleston to "blow up the newspaper office and hang the Governor."

The prosecution put state and federal officials on the witness stand May 4 to identify Blizzard as the leader of the army. Major Charles T. Smart, of Louisville, who commanded troops up Coal River, said he found through Blizzard the only quick means of getting into successful touch with the armed miners. When they refused to come to terms on surrendering their arms Major Smart said he asked Blizzard to use his influence. Within ten minutes the men began coming forward with their arms, many of them crossing a stream to get arms which evidently had been hidden in the grass and brush.

Sheriff V. N. Griffith, of Boone County, identified Blizzard as the man who had been in conference on Friday, Sept. 1, with Captain Wilson and others in Madison and who had told the federal commander that, having been on all the firing fronts that day, he knew the men were ready to surrender as soon as federal officials reached the scene.

Harold M. Richards, mine superintendent, of Blair, quoted Blizzard as saying he had not "slept or eaten for thirty-six hours" while he was "trying to save the guns for some of the men." Richards also told of having heard Blizzard encourage the miners at the temporary headquarters of the men at Blair to "hold out until the federal forces arrive, and then surrender. At this time and for a few days thereafter the fighting continued," Richards declared.

J. S. Moore testified May 6 that Jim Morris, at a meeting of the local union of which he was president, told every man who didn't take part in the fight "his toes would be turned up to the sun." Moore corroborated Richards' testimony that men had been placed to shoot any state police that might arrive by train.

Production and the Market

Weekly Review

SPOT prices on bituminous coal advanced last week while production for the country as a whole remained practically stationary compared with the last week in April. The first week of May recorded gains in production over April in every large field save in the stronghold of the non-union operations in central and southwestern Pennsylvania and in northern West Virginia. Even here each day of May has recorded slight gains.

Coal Age Index of spot prices advanced 9 points from 221 on May 1 to 230 on May 8. The most notable gains were in the North Atlantic, New England, Pittsburgh and Southern markets, the Midwest region alone remaining stationary. Perhaps even the Chicago market would have advanced but for an unusual influx around the first of May of coal from western Kentucky. Speculators in Chicago are reported to have bought heavily in that coal, to have overstocked the market and to have lost.

DEMAND GAINS, IN PLACES EXCEEDING SUPPLY

Demand is steadily gaining and in spots is ahead of the available supply, which accounts for the strength of the market. Eastern centers are now feeling the pinch most strongly. The output from central Pennsylvania is so short of filling the demand of those consumers who have no other source of supply that heavy premiums are being exacted in this trade. Special grades of coal are no longer demanded and in the local scramble to obtain tonnage for particular spots in eastern New York and New Jersey prices have gone up to $4 per net ton.

Hampton Roads coals have more than filled the demand at those points that can be reached by water-borne coals. The demand from the West for these coals, however, has reduced the offerings in New York Harbor, but has not as yet affected the price.

Reserves are still being utilized wherever possible, but the number of active buyers is increasing daily. There is a more healthy tone to general business and fear is being expressed that the budding industrial boomlet may be nipped by prohibitive coal prices caused by the continuance of the strike. A reversal of sentiment is growing among operators, especially in the Eastern Inland district, from the extreme wage cuts originally proposed. Higher prices are surely a deterrent to talk of wage reductions and it is quite possible that prompt acceptance would follow any overture on the part of the miners for separate district wage conferences.

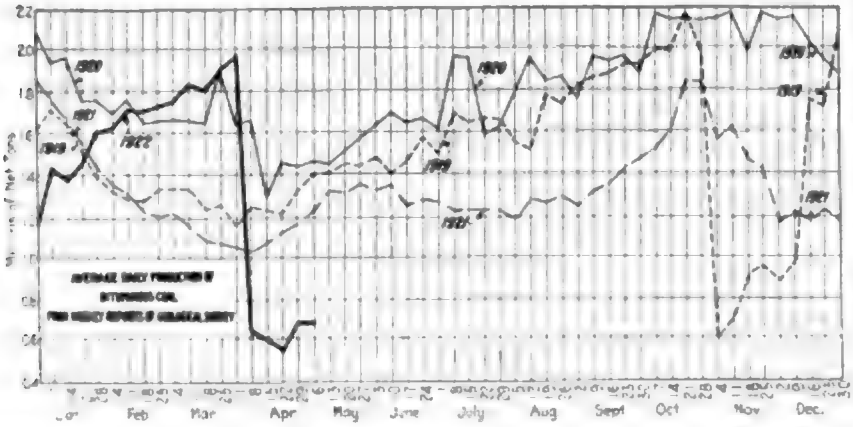
A growing uneasiness is apparent among consumers as stockpiles dwindle. Shortage conditions are far away, but the buyer has in times like these been prone to mill around as soon as his reserve bin loses its well-filled appearance. Last minute reports from New England show that for the first time in months water-borne coal is in actual demand. A week ago distress coal was common but this has all been cleaned up and buyers are requesting more. This despite the fact that the textile strike has removed much buying power that would otherwise be in evidence. It is being recalled in the trade that when New England goes on a coal-buying rampage, the lid is off.

Anthracite production, of course, is at a standstill but there is no activity in any market. Retail stocks of domestic coal are slowly dwindling but distribution is only for current needs. Steam coals also are quiet, although but little is offering aside from Buckwheat No. 1.

BITUMINOUS

"Production of coal has struck a temporary level a little above the 4,000,000-ton mark," says the Geological Survey. "The output for the week of April 29 was 4,150,000 tons, and early reports indicate that last week (May 1-6) will show a like amount. Production of anthracite remains practically zero.

"The total output of all coal—anthracite and bituminous



Estimates of Production

(Net Tons)

BITUMINOUS	1922	1921
Apr. 15	3,656,000	6,528,000
Apr. 22 (b)	3,575,000	6,815,000
Apr. 29 (a)	4,150,000	6,984,000
Daily average	692,000	1,164,000
Calendar year	144,504,000	127,151,000
Daily av. calendar yr.	1,438,000	1,266,000
ANTHRACITE		
Apr. 15	6,000	1,885,000
Apr. 22	6,000	1,903,000
Apr. 29 (a)	6,000	1,945,000
COKE		
Apr. 22 (b)	94,000	73,000
Apr. 29 (a)	87,000	76,000
Calendar year	2,304,000	2,850,000

(a) Subject to revision. (b) Revised from last report.

—in the fourth week of the strike (April 24-29) was 4,156,000 tons. In the fourth week of the 1919 strike 5,334,000 tons of bituminous coal and 1,759,000 tons of anthracite were produced, a total of 7,093,000 tons. Current weekly output of all coal is therefore running some 3,000,000 tons short of the 1919 experience.

"Much the same rate of production obtained last week (May 1-6), the fifth of the strike. A decrease on Monday, associated with the May Day holiday, was overcome the following day, and on Wednesday loadings reached 12,810 cars, the highest figure recorded since the strike began. The total loadings for the week bid fair to be practically the same as in the fourth week. The trend of production may be seen from the following table of cars loaded daily:

Day	First Week	Second Week	Third Week	Fourth Week	Fifth Week
Monday	11,445	10,772	7,898	12,131	11,919
Tuesday	11,019	10,658	10,041	12,377	12,120
Wednesday	11,437	10,961	11,088	12,622	12,810
Thursday	11,090	11,402	11,193	11,981	12,460
Friday	11,296	10,714	11,596	12,362	......
Saturday	8,888	8,501	10,194	11,295	......

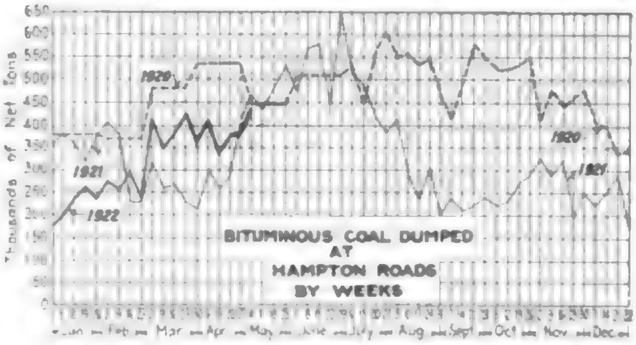
"The situation is, therefore, essentially unchanged. No significant break in the ranks of striking miners has occurred, although a small number of men have gone back to work in Texas. The number of non-union men on strike has not changed materially. The accumulation of unbilled cars of coal is slowly decreasing, but is still above normal. Demand is stiffening, but the market is still not active enough to call out full production from mines remaining at work.

"As before, consumption is being met largely from storage. At the present rate of output the draft upon consumers' stockpiles cannot be much less than 4,000,000 tons a week.

"Substantial progress was made in reducing the number of unbilled loads of coal during the fourth week of the strike. The average number of unconsigned loads for the week ended April 22 was 22,663 cars of bituminous coal and 1,254 cars of anthracite. During the last week of April the number was 17,708 cars of bituminous and 1,042 cars of anthracite."

All-rail movement of bitumious coal to New England during the week ended April 29 was the lowest since the strike began. Only 769 cars were forwarded, a decrease of about 20 per cent from the week before and but one-fifth of that in the week preceding the strike. Central Pennsylvania grades are quotably higher and this tonnage is absorbed in more active markets than New England presents.

Dumpings at the Roads were 433,960 net tons during the week ended May 4, as compared with 384,677 tons during the preceding week. Coal awaiting loading at the piers is now lower than for some time. South America is taking a heavier tonnage, as is the bunker trade. New England shipments are again increasing, as distress cargoes in that section have been cleaned up.



Lake business has been hit by growing industrial demand. Non-union coal is still being dumped at the lower ports, but at the rate of 700 cars daily, much below that prevailing in May last year. Much of this coal is going to Buffalo furnaces instead of the Northeast. Head-o-the-Lakes docks have received and unloaded most of the coal which has cleared from the lower ports and the up-bound movement has declined. Market conditions, however, are sluggish in the Northwest—buyers have resumed their attitude of indifference, reassured by the 2,700,000 tons of soft coal on the docks, awaiting distribution whenever they may choose to place their orders.

COKE

Production of beehive coke declined further during the last week of April, although the decrease was less marked than earlier in the month. The output was 87,000 net tons, a decrease of 7 per cent from the preceding week. The market is inactive, both supply and demand being light, as the average furnace cannot pay asking prices.

Connellsville coal is very scarce and in strong demand.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Apr. 10, 1922	Apr. 24, 1922	May 1, 1922	May 8, 1922†
Smokeless lump	Columbus	$2.85	$2.85	$3.05	$2.75@$3.00
Smokeless mine run	Columbus	2.15	2.00	2.40	2.25@2.50
Smokeless screenings	Columbus	1.35	1.55	1.75	**2.10@2.25**
Smokeless lump	Chicago	2.40	2.30	2.75	**2.75@3.00**
Smokeless mine run	Chicago	1.75	1.80	1.95	**2.00@2.50**
Smokeless lump	Cincinnati	2.50	2.65	2.90	2.75@3.00
Smokeless mine run	Cincinnati	1.90	2.00	2.15	**2.50@2.65**
Smokeless screenings	Cincinnati	1.65	1.90	2.15	**2.25@2.50**
*Smokeless mine run	Boston	4.60	4.80	5.05	**5.40@5.85**
Clearfield mine run	Boston	2.05	2.70	2.60	**3.00@3.25**
Cambria mine run	Boston	2.30	3.25	3.00	**3.25@3.75**
Somerset mine run	Boston	2.10	2.70	2.80	**3.15@3.60**
Pool 1 (Navy Standard)	New York	2.80	3.65	3.75	3.50@4.00
Pool 1 (Navy Standard)	Philadelphia	2.80	3.45	3.70	**3.60@3.90**
Pool 1 (Navy Standard)	Baltimore	2.70	3.75	3.75	**3.75@4.00**
Pool 9 (Super. Low Vol.)	New York	2.40	3.25	3.25	**3.25@3.75**
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	3.05	3.30	**3.25@3.50**
Pool 9 (Super. Low Vol.)	Baltimore	2.80	3.25	3.40	3.25@3.50
Pool 10 (H. Gr. Low Vol.)	New York	1.95	3.00	3.00	**3.00@3.50**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.00	2.90	3.15	**3.10@3.30**
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.25	2.95	3.25	3.25
Pool 11 (Low Vol.)	New York	1.75	2.75	2.75	**2.75@3.25**
Pool 11 (Low Vol.)	Philadelphia	1.75	2.70	2.80	**2.70@3.00**
Pool 11 (Low Vol.)	Baltimore	2.15	2.85	3.10	**3.10@3.25**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.70	2.50	2.70	2.50@2.85
Pool 54-64 (Gas and St.)	Philadelphia	1.55	....	2.50	**2.80@2.95**
Pool 54-64 (Gas and St.)	Baltimore	1.70	....	3.00	2.85@3.10
Kanawha lump	Columbus	2.35	2.45	2.90	**3.00@3.25**
Kanawha mine run	Columbus	1.55	2.15	2.65	2.50@2.75
Kanawha screenings	Columbus	1.45	1.70	2.00	**2.00@2.15**
W. Va. Splint lump	Cincinnati	2.00	2.65	2.75	*2.50*
W. Va. Gas lump	Cincinnati	1.75	2.40	2.75	**2.75@3.00**
W. Va. mine run	Cincinnati	1.55	1.95	2.40	**2.35@3.00**
W. Va. screenings	Cincinnati	1.40	1.90	2.20	**2.25@2.75**
Hocking lump	Columbus	....	2.65	3.05	**3.00@3.25**
Hocking mine run	Columbus	....	2.15	2.90	2.75@3.00
Hocking screenings	Columbus	....	1.75	2.15	**2.00@2.50**
Pitts. No. 8 lump	Cleveland	2.60	3.40	3.25	2.75@3.25

	Market Quoted	Apr. 10, 1922	Apr. 24, 1922	May 1, 1922	May 8, 1922†
Pitts. No. 8 mine run	Cleveland	$1.80	$2.55	$2.90	**$2.85@$3.10**
Pitts. No. 8 screenings	Cleveland	1.85	2.55	2.90	**2.85@3.10**
Midwest					
Franklin, Ill. lump	Chicago	3.45	3.45	3.45	3.30@3.65
Franklin, Ill. mine run	Chicago	2.75	2.75	3.00	2.75@3.25
Franklin, Ill. screenings	Chicago	2.65	2.75	3.00	2.75@3.25
Central, Ill. lump	Chicago	2.60	2.65	2.75	2.60@2.85
Central, Ill. mine run	Chicago	2.60	2.65	2.75	2.60@2.85
Central, Ill. screenings	Chicago	1.85	1.85	2.00	1.75@2.25
Ind. 4th Vein lump	Chicago	3.15	3.15	3.15	3.00@3.25
Ind. 4th Vein mine run	Chicago	2.45	2.50	2.50	2.25@2.75
Ind. 4th Vein screenings	Chicago	2.00	2.25	2.25	2.00@2.50
Ind. 5th Vein lump	Chicago	2.60	2.60	2.60	2.50@2.75
Ind. 5th Vein mine run	Chicago	2.60	2.60	2.60	2.50@2.75
Ind. 5th Vein screenings	Chicago	2.20	2.40	2.40	2.25@2.50
Standard lump	St. Louis	2.65	....	3.15	....
Standard mine run	St. Louis	1.90	....	2.75	....
Standard screenings	St. Louis	1.70	....	2.75	
West. Ky. lump	Louisville	2.45	2.20	2.60	**2.75@3.00**
West. Ky. mine run	Louisville	1.90	2.00	2.60	**2.50@2.75**
West. Ky. screenings	Louisville	1.90	2.25	2.60	**2.50@2.75**
South and Southwest					
Big Seam lump	Birmingham	2.00	2.00	2.00	1.95@2.10
Big Seam mine run	Birmingham	1.70	1.70	1.70	1.50@1.90
Big Seam (washed)	Birmingham	1.85	1.85	1.85	**2.00@2.25**
S. E. Ky. lump	Louisville	2.25	2.40	2.75	**2.75@3.00**
S. E. Ky. mine run	Louisville	1.70	2.40	2.75	**2.75@2.85**
S. E. Ky. screenings	Louisville	1.50	1.70	2.75	*2.60@2.75*
S. E. Ky. lump	Cincinnati	1.90	2.40	2.90	*2.50@2.75*
S. E. Ky. mine run	Cincinnati	1.60	2.00	2.40	**2.40@2.75**
S. E. Ky. screenings	Cincinnati	1.45	1.65	2.25	**2.35@2.65**
Kansas lump	Kansas City	4.25	4.25	4.25	4.00@4.50
Kansas mine run	Kansas City	4.00	4.00	4.15	4.00@4.25
Kansas screenings	Kansas City	2.55	2.50	2.65	2.50@2.75

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in heavy type, declines in italics.
Note—Smokeless prices now include New River and Pocahontas.

How the Coal Fields Are Working

Percentage of full-time operation of bituminous coal mines, by fields, and as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Apr. 1, 1922 Inclusive	Apr. 3 to Apr. 22, 1922 Inclusive	Week Ended Apr. 22
U. S. Total	45.6	55.7	....	....
Non-union				
Alabama	63.5	64.6	71.3	68.0
Somerset County	55.5	74.9	76.7	60.8
Panhandle, W. Va.	55.3	51.3	30.9	31.1
Westmoreland	54.9	58.8	73.7	66.0
Virginia	54.8	59.9	64.3	70.9
Harlan	53.3	54.8	39.0	47.8
Hazard	51.7	58.4	54.1	69.5
Pocahontas	49.8	60.0	68.3	69.0
Tug River	48.1	63.7	70.8	76.3
Logan	47.6	61.1	66.8	66.1
Cumberland-Piedmont	46.6	50.6	8.4	9.0
Winding Gulf	45.7	64.3	63.0	62.5
Kenova-Thacker	38.2	54.3	67.1	71.9
N. E. Kentucky	32.9	47.7	55.6	58.3
New River‡	24.3	37.9	7.3	6.1
Union				
Oklahoma	63.9	59.6	18.4	17.0
Iowa	57.4	78.4	0.0	0.0
Ohio, north and central	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	0.1	0.0
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	9.7	29.0
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	11.9	10.3
Fairmont	35.3	44.0	5.6	8.4
Western Kentucky	32.5	37.7	23.0	1.0
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	0.7	0.7
Ohio, southern	22.9	24.3	0.0	0.0

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

West Virginia is furnishing a large tonnage for coke making, replacing lost Connellsville production.

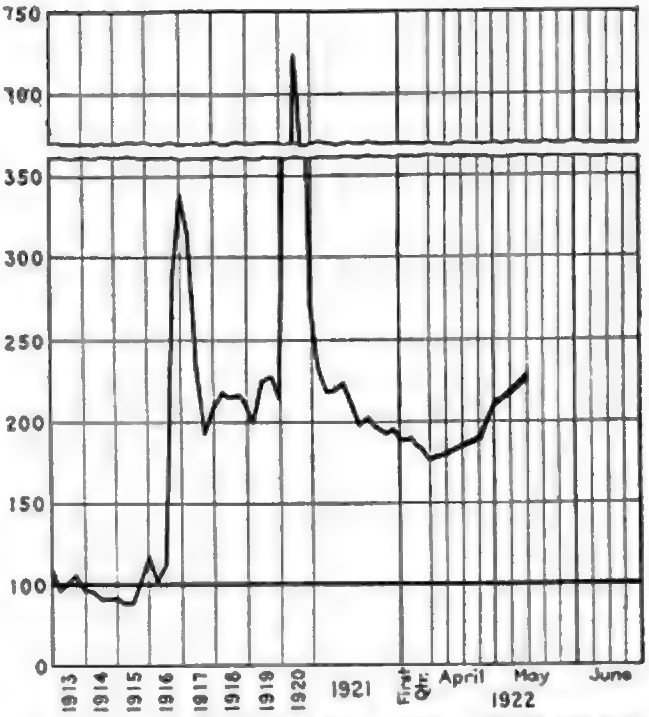
ANTHRACITE

With the exception of a few cars of steam sizes dredged from the rivers, the anthracite mining industry is at a standstill. Production during the week ended April 29 is estimated at only 6,000 tons.

All-rail movement to New England during the week ended April 29 totaled 501 cars, as compared with 371 during the preceding week. There is no interest being shown in the Lake market, as stocks on the Northwestern docks are sufficient to last through the summer and these dock interests are of course unwilling to enter into negotiations until the new mining conditions shall have been determined.

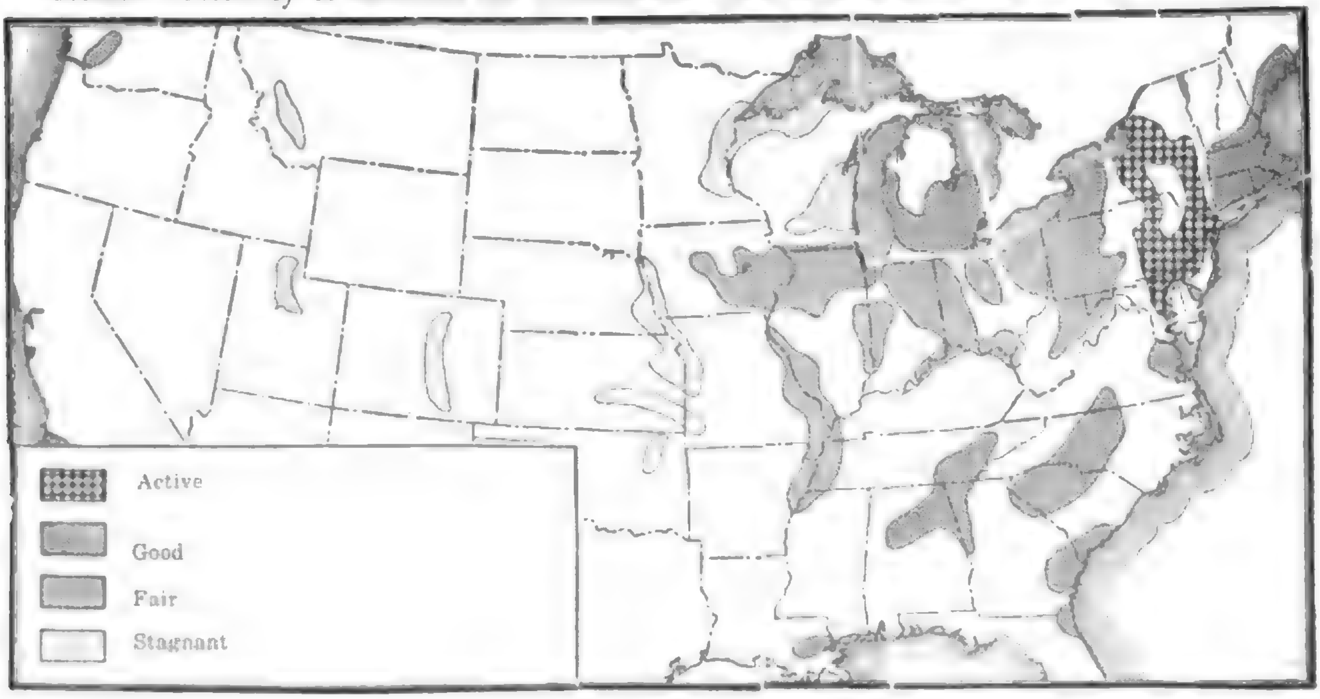
The market is almost lifeless. The light domestic tonnage on wheels is not easily sold and prices are no stronger. At New York there is still some coal in boats, but dealers are in no hurry to replenish their stocks. Retailers have reduced their supplies to the point where they no longer express any fear of possible lower costs to come after mining is resumed.

There is enough pea at the mines to last all summer if necessary. Buckwheat No. 1 is still available but with other sizes well disposed of the steam market is devoid of any activity that might be expected.



Coal Age Index 230, Week of May 8, 1922. Average spot price for same period, $2.78. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh and Standard prices not included in figures for last week.)

Relative Activity of Markets for Bituminous Coal at End of Fifth Week of Strike



Foreign Market And Export News

British Production Declines Sharply; Little Stimulus from U. S. Strike

EASTER week produced a marked decline in the British coal output. Tonnage mined was 3,544,000, the lowest since the Christmas holiday period, according to a cable to *Coal Age*. The output for the previous week was 4,384,000 gross tons.

Demand is steady and prices are firm for the best grades. Other coals show a softening range. Germany and France are making inquiries for tonnage. It was thought that producers were holding back in the belief that the strike in the United States would afford an unusual market, but American and Canadian inquiries have disappeared in the past ten days, although a number of exporters are offering coal in that direction. Aside from the diversion of a few orders from South America and the Mediterranean the stoppage has had no beneficial effect on the British coal trade.

Merchants are satisfied that although there are no phenomenal inquiries from abroad, contracts are coming in at a steady pace and most pits are booked up. Norwegian State Railways have bought 45,000 tons of best steams, Russian Co-operative Societies, 25,000 tons best steams, Malmo Cement Works, 20,000 tons second gas coals, and Bordeaux gasworks, 8,000 tons best Durham gas coals.

Hampton Roads Has Good Week

Activity in all branches is holding its own, with prospects of continued brisk business. Prices continue upward gradually, the best grades reaching the highest point in the last twelve months. Continued scarcity of high-volatile kept those prices extremely high.

Scarcity of coal in ports to the north appear to be having a stimulating effect. Mines serving the port in some instances reported capacity output, while others reported no unusually great demand for coal.

Export business was better, while shipments to New England were slightly below normal. Bunkering is gradually picking up, on the crest of the increase in general shipping. The N. & W. Piers had the bulk of the business, bidding fair to set a new high record of dumpings.

Coal Paragraphs from Foreign Lands

ITALY—Cardiff steam first is now quoted at 42s. 3d., according to a cable to *Coal Age*. Last week's quotation was 42s. 9d.

Coal landed at Genoa during 1921 totaled 1,772,535 tons (1920, 1,649,500), which compares with a pre-war total of 3,250,000 tons. However, the arrivals at the Spezia port are increasing, and amount for 1921 to 371,868 tons, against 250,000 tons before the war.

GERMANY—Production of coal in the Ruhr region during the week ended April 22 was 1,525,000 metric tons, according to a cable to *Coal Age*. In the preceding week 1,578,000 tons were mined.

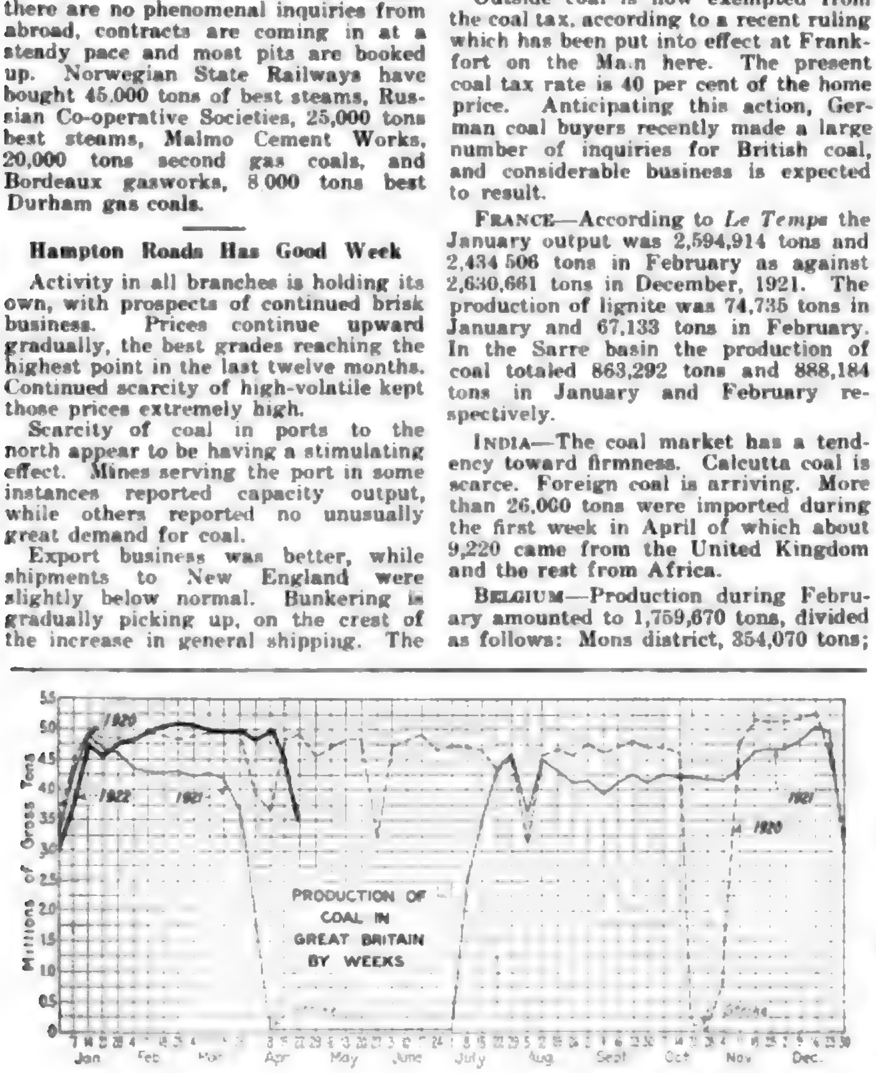
Outside coal is now exempted from the coal tax, according to a recent ruling which has been put into effect at Frankfort on the Main here. The present coal tax rate is 40 per cent of the home price. Anticipating this action, German coal buyers recently made a large number of inquiries for British coal, and considerable business is expected to result.

FRANCE—According to *Le Temps* the January output was 2,594,914 tons and 2,434,506 tons in February as against 2,630,661 tons in December, 1921. The production of lignite was 74,735 tons in January and 67,133 tons in February. In the Sarre basin the production of coal totaled 863,292 tons and 888,184 tons in January and February respectively.

INDIA—The coal market has a tendency toward firmness. Calcutta coal is scarce. Foreign coal is arriving. More than 26,000 tons were imported during the first week in April of which about 9,220 came from the United Kingdom and the rest from Africa.

BELGIUM—Production during February amounted to 1,759,670 tons, divided as follows: Mons district, 354,070 tons; Centre, 298,250; Charleroi, 615,010; Namur, 49,680; Liége, 416,660; Limbourg, 26,000. Stocks at the end of the month totaled 901,920 tons. Compared with the output of 1,871,630 tons in January and the monthly average for 1921 of 1,815,564 tons the February figures showed a slight reduction.

The Belgian coal market is not lively and rates show no change. Domestic coals remain weak. It appears that an agreement regarding wages is on the point of being reached on the basis of 7 or 8 per cent, not 10 per cent, as proposed by the owners.



Hampton Roads Pier Situation

	Week Ended April 27	Week Ended May 4
N. & W. Piers, Lamberts Point:		
Cars on hand	2,569	2,141
Tons on hand	138,617	119,620
Tons dumped	188,019	201,641
Tonnage waiting	22,000	15,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,333	978
Tons on hand	66,650	48,650
Tons dumped	92,172	122,391
Tonnage waiting	16,000	10,757
C. & O. Piers, Newport News:		
Cars on hand	921	642
Tons on hand	46,050	32,100
Tons dumped	63,271	63,438
Tonnage waiting	2,251	4,290

Export Clearances, Week Ended, May 4, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Nor. S. S. Tune, for Curacao	2,643
Am. Schr., Nat. L. Gorton, for Barbados	268
For Brazil:	
Br. S. S. Boswell, for Buenos Aires	2,291
Br. S.S. Madras City, for Rio de Janeiro	7,117
For Chile:	
Am. S.S. West Jaffrey, Chilean ports	5,005
For Cuba	
Nor. S.S Munorway, for Havana	5,896
For Greece	
Grk. S.S. George M. Embiricos, for Piraeus	9,931

Pier and Bunker Prices, Gross Tons

PIERS

	April 29	May 6†
Pool 9, New York	$6.15@$6.40	**$6.25@$6.50**
Pool 10, New York	5.80@6.10	**6.15@6.35**
Pool 9, Philadelphia	6.10@6.50	**6.30@6.55**
Pool 10, Philadelphia	5.75@6.10	**6.00@6.35**
Pool 71, Philadelphia	6.50@6.65	**6.50@6.80**
Pool 1, Hamp. Rds	4.75@5.25	**5.10@5.50**
Pools 5-6-7 Hamp. Rds	5.25@5.40	**5.50**
Pool 2, Hamp. Rds	4.75@4.85	**4.95@5.15**

BUNKERS

	April 29	May 6†
Pool 9, New York	$6.45@$6.70	**$6.60@$6.80**
Pool 10, New York	6.10@6.40	**6.45@6.65**
Pool 9, Philadelphia	6.40@6.60	**6.50@6.75**
Pool 10, Philadelphia	6.00@6.40	**6.15@6.60**
Pool 1, Hamp. Rds	4.95@5.00	**5.50**
Pool 2, Hamp. Rds	4.80	**5.25**
Welsh, Gibraltar	43s. f.o.b	43s f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b	55s f.o.b.
Welsh, Lisbon	43s. f.o.b.	43s f.o.b.
Welsh, La Plata	50s. f.o.b.	50s f.o.b.
Welsh, Genoa	43s. t.i.b.	43s. t.i.b.
Welsh, Messina	38s. f.o.b.	38s. f.o.b.
Welsh, Algiers	41s. f.o.b.	41s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s 6d f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s 6d f.o.b.
Welsh, Madeira	42s 6d. f.a.s.	42s 6d f.a.s.
Welsh, Teneriffe	40s. 6d. f.a.s	40s 6d f.a.s.
Welsh, Malta	44s. 6d. f.o.b.	44s. 6d. f.o.b.
Welsh, Las Palmas	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Naples	38s. f.o.b	38s f.o.b.
Welsh, Rosario	52s. 6d. f.o.b	52s. 6d f.o.b.
Welsh, Singapore	57s. 6d. f.o.b	57s. 6d f.o.b.
Port Said	46s. 6d. f.o.b	46s. 6d. f.o.b.
Alexandria	45s.	44s
Capetown		35s 3d

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	April 29	May 6†
Admiralty, Large	28s 6d	**28s6d@28s9d**
Steam, Smalls	19s@20s	19s to 20s.
Newcastle:		
Best Steams	23s@24s	23s@24s.
Best Gas	23s@24s	**24s.**
Best Bunkers	22s@22s 6d	**22s. 6d.**

†Advances over previous week shown in **heavy type**; declines in *italics*.

North Atlantic

Increased Output Fails to Stem Rising Tide of Prices

Consumers Still Rely on Reserves Rather Than Enter High-Priced Spot Market—Buyers in Need Increasing—Steadying Efforts Made.

PRODUCTION has been increased recently, but not sufficiently to stem the rising tide of prices. Line trade is picking up in excess of the supply and hardening prices have resulted. The flood of Southern coals to Philadelphia and New York has been checked by the better markets in other sections for the smokeless varieties.

Consumers still prefer to use reserves rather than enter the high-priced spot market, but the number who must have coal is increasing. The more substantial factors in the trade fear the effect of this rising market and are advising buyers to hold off unless buying is absolutely necessary. These shippers are offering to buy coal, when needed, at the best figure plus a reasonable commission.

NEW YORK

With supplies becoming shorter and the prospects not bright for an early ending of the strike, quotations are showing more strength. There were but a few more than 1,000 cars at the local loading piers on May 5, a large decrease from the corresponding day of the previous week.

Comparatively few buyers were around, but those who wanted coal badly were not particular as to whether it was Pool 9 or 10, so long as it looked like coal and would burn.

The shipping of Southern coals west has tended to strengthen quotations, some ranging around $5.40 at Hampton Roads, which made the coal available for local buyers at around $6.50, if taken from the vessel in which it came. To make these coals more available, however, some shippers have undertaken to load the coal into small barges, quoting $6.40@$6.75.

Local houses are watching closely the importation of English coals. Some inquiries regarding the local situation have been received but it is not thought English mine owners will undertake to send their coals to these shores unless they feel sure that they could sell it at around $8 per ton.

BALTIMORE

The call for fuel is growing rapidly and prices are tightening.

It is impossible to quote a really stable price list, but as a whole it may be said that the offerings of Pool 9 and 71 are quickly absorbed at $3.25@$3.50, with sales occasionally up to $3.75@$4. Gas coals too are quite strong, the quotations on Fairmont running $3.10@$3.50 a net ton. Bunker coals of usual delivery here are quoted $6.60@$6.85, alongside. A feature of this business, however, is had in receipts here by barges of coal loaded at Hampton Roads, and which has been sold as low as $5.50, alongside.

While the export situation is at a complete standstill, not a single ship having loaded on foreign account for nearly a month, an increase is noted in intercoastal coal shipment. Recently there was a shipment of 909 tons for Seattle, 210 tons for Portland, Ore., 300 tons for Los Angeles and 818 tons for San Francisco.

FAIRMONT

Production during the last week of April was the largest since the beginning of the strike. Probably 5,000 miners are now at work. The larger companies, however, are not operating. Demand in the East is strong, the price ranging $2.50@$3.

CENTRAL PENNSYLVANIA

The effectivenes of the strike in this field is best told by production figures for April, which show the output to have been 11,914 cars as against 84,828 cars for March.

Operators claim the peak of the strike has been passed. This would appear to be borne out by the fact that during the week ended April 29, the district produced 2,445 cars as against 2,057 cars in the previous week.

There was but little change, however, in the strike conditions at the end of the fifth week. Efforts are being made in the Somerset District to operate the mines and both the Berwind-White and the Lochrie interests about Winber are increasing their output.

UPPER POTOMAC

Although efforts of the U. M. W. are not abating, there is a drift of men back to the mines and production is being slowly increased. Prices have stiffened to a considerable extent. Buyers are not finding it an easy matter to secure all the coal needed in this territory. Suspension continues to be general throughout the Georges Creek region.

PHILADELPHIA

While production has been increased recently, still it has not been on a sufficient scale to hold back prices. The trend to higher figures has been maintained all around.

Coal is not easily obtainable, and Pool 1 is almost out of the market. Some consumers with buyers stationed in the region snap up this grade even before it is in the cars.

This matter of high prices is not satisfactory to the more substantial factors in the trade, as they fear many more increases will mean trouble for all producers. There are shippers who are advising consumers to hold off buying unless absolutely necessary and thus help to stem the tide. Shippers such as these are offering their services to consumers to buy coal at the best figure plus a fair commission.

Even yet the consumer is not actively seeking coal, outside of the big buyers allied with the iron and steel trade, which industry seems to maintain its improvement.

Coke

UNIONTOWN

Operators are commencing to realize what the ultimate effect of the strike will be upon the market of the future regardless of its ultimate settlement. That view is brought closer home by the report that efforts are being made for an adjustment of freight rates from the Virginia fields to the Eastern market, which will enable producers there to compete better with Connellsville.

To what extent the Carnegie Steel Co. will return to the Frick mines in the Connellsville region for its byproduct coal is also another question. Since the construction of the Clairton byproduct plant the Frick mines have been depended upon almost entirely for raw coal. That portion of the needed tonnage cut from the Connellsville field is now being received from West Virginia.

The coal market has taken on considerable life and while there is no trace of panicky feeling there is more demand than can be supplied. All grades of steam coal are quoted $2.90@$3.10 while byproduct is selling $3.10@$3.25. The coke situation is unchanged, there being no distinction between furnace and foundry, with $6@$6.75 prevailing for both grades.

CONNELLSVILLE

Production of coke has been practically stationary since about April 25, at approximately one-third the rate in the latter part of March. Merchant production has decreased slightly less in percentage than production by the furnace ovens. Almost all the merchant production is going out on contract. Offerings of furnace coke are very light but demand is equally light as the average furnace would not think of paying prices asked. The market, of paying prices asked.

The Carnegie Steel Co. has been operating 32 blast furnaces since the middle of April, against 34 on April 1. Pig iron production of the Pittsburgh district was at a shade higher rate in April than in March. Once the district was entirely tributary to the Connellsville region, but now it has the Clairton byproduct plant, the largest in the world, the large beehive plant of the Jones & Laughlin Steel Co., the new byproduct plant of the same interest and the byproduct plant at Midland of the Pittsburgh Crucible Co. These plants had stocks of coal when the strike started and can draw coal from various districts where it is now available.

BUFFALO

The outside trade is about at a standstill. The beehive oven districts are idle, so that jobbers are seldom able to obtain anything. Local furnaces have their own ovens and are for the most part independent of outside supplies. Semi-nominal quotations are $5.25@$5.50 for 72-hr. Connellsville foundry, $4@$4.25 for 48-hr. furnace and $3.50 for stock.

Anthracite

Retail Stocks Disappear But Apathy Continues

Consumers Buy Only to Piece Out Bare Needs—With Dwindling Stocks Retailers Cease Anxiety Over Freight Reduction—Loaded Boats Plentiful at New York; Buyers Scarce.

LACK of demand is the continued feature of the market. Even with no coal being produced the retail trade is sluggish, the consumer showing no anxiety over the situation and buying only in small lots to piece out his season's requirements. Yard stocks are gradually being worked off, however, and retailers have now passed the stage where anxiety is expressed over reduced freight rates or mine prices, as they have converted most of their tonnage into cash.

New York Harbor still has plenty of loaded boats, but buying is slow. The steam trade is sluggish, although buckwheat is now the only size easily obtainable. No interest is yet being shown in the Lake market.

ANTHRACITE FIELDS

The fifth week of the strike passed quietly, aside from a certain restlessness and numerous rumors of settlement circulating among the men. Some strikers are now feeling the pinch of unemployment. Merchandise is on a strictly cash basis as merchants remember the 1902 strike which caused them heavy losses through credit extension at that time.

The men appear to have lost some of their feeling of confidence. Increased wages do not seem as likely to them now and many consider that a resumption at the old wages would be a satisfactory settlement.

NEW YORK

Lack of demand with no coal being produced is the outstanding feature of the local market. Middle houses who have coal in boats or are in a position to get some receive few inquiries. No particular effort is being made to induce buying.

Consumers are buying at such a slow pace that retail stocks are holding out better than was anticipated. Some dealers who last month believed their stocks would be cleaned up early in May now count on having some coal throughout the entire month.

Most of the domestic coals available have been loaded into boats and this is independent product. The companies have moved nearly all of their coals above pea size. The latter continues plentiful with no call for it.

Quotations for independent domestic coals practically mean nothing now. It was said last week that a prospective buyer had been offered a cargo of stove coal on a basis of $8.10 at the mine, while other quotations for the same size ranged as high as $8.75. Stove was in better demand than either egg or chestnut.

Loaded boats of pea coal were being quoted $7.50@$8.50, alongside. There was practically no change in the steam coal situation and the demand was quiet.

PHILADELPHIA

As yet the weather has failed to warm up and much more coal is being burned than usual at this time of the year. It is when the occasional warm day appears that the real state of trade is discernible, as there is an immediate cessation of all deliveries.

Many yards are entirely out of nut, and others are holding back what little they have for special business that they take care of all season long. Pretty much the same thing can be said of stove coal. Pea has been a good mover recently, but even though the dealer can replace this size there is little buying done.

The yards are now beginning to show signs of emptiness, which is just what the dealers want. They have now passed the stage where anxiety over reduced freight rates or mine prices no longer cause apprehension, as they have converted most of their stocks into cash.

Steam trade is quiet, with buckwheat about the only size to be had. The companies have big stocks and are anxious to move it soon. Quite a little of it will soon reach the two-year storage limit, when according to the freight tariff, it will have to take a local rate to destination. Yet despite the almost entire absence of rice and barley the consumer shows little disposition to take buckwheat.

Retailers have settled themselves down to a long idleness, and this is as much due to the consumers' increasing lack of interest as anything else.

BALTIMORE

There is little to report except that the small supplies in yards keep dwindling. Dealers have received only two carloads during May and there is little prospect of any immediate shipment.

The smaller yards are gradually running out of fuel. The general public does not seem to be at all worried, being firm in the belief that it can be taken care of later in the year. The amount of business on the books on the majority of dealers is much smaller than in normal seasons.

BUFFALO

"We have coal enough to last till fall and if the strike is not settled then we can still keep up with our winter trade," is the claim made by a representative of one of the larger anthracite companies. It is quite possible that he may be called on to make his words good, for the strike is much more complete than the bituminous and promises to hold longer.

At the same time consumers are not buying any coal of account, so that the stocks on hand are not moving. There is considerable egg in storage and some companies are said to have plenty of chestnut not far away. The trade as a whole is much more stagnant than bituminous.

Only two anthracite cargoes have been shipped, 19,500 net tons, and one of coke, 2,500 tons. Another coke cargo is chartered, but it has not arrived yet. The amount of anthracite shipped in April last season was 257,705 tons.

BOSTON

A few independents and brokers are offering domestic sizes at around $9, f.o.b. mines, but sales are meager. The producing companies that were picking up coal from storage piles or were gradually selling coal on cars that were unbilled have now very nearly cleaned up the odd lots that were available. A small number of cargoes are still coming forward from New York piers, but another fortnight will probably see the last of them.

Retail business continues extremely dull. The public preserves its non-buying attitude, preferring to run the risk of a tight market later on. It is amazing how little interest is taken in the suspension.

West

SALT LAKE CITY

Retail coal dealers of Salt Lake City and Ogden have announced a new price schedule as a result of the reduction made by the operators, following the new wage scale. Hereafter lump coal will be $9; domestic lump, $8.50; egg, $8; screened slack, $4.50, and mine slack $4. Business is poor as a result of the rising temperature. The coal trade generally is not suffering from the strike, tense though the situation is in the mining fields. Enough coal is being produced to meet all of the state's light demand.

KANSAS CITY

The coal trade in the Southwest is just marking time. No coal is being produced, except at a few small co-operative mines and there is not much demand for what little is being mined. These small mines are not equipped to screen the coal, and the demand for mine run is never strong in this section. However if the strike continues for another 30 days the steam plants will have to use whatever they can get, as the storage coal will not last much longer than that.

The outlook for business when the mines do open, is good as the farmers have been getting a better price for their grain and live stock since the reduction in freight rates, which has also had the effect of stimulating buying of farm machinery and lumber for buildings. On top of this, the excessive rains in the plains country, almost insures a good wheat crop. Altogether the farmer is beginning to see a way out for the first time in several years, and as this country is dependent on agricultural and live stock, it argues well for business in general.

Prices are practically unchanged from the pre-strike level.

Chicago and Midwest

Kentucky Flood of Coal Gorges Western Market

But Heavy Flow from Mines Continues In Other Directions—Many Jobbers Are Hard Hit—Gentle Swelling of Demand Is Seen—Prices Firmer.

THIS region has weathered another week of light demand and plentiful supply, and the game of hunting stealthily for buyers and of waiting daily for a burst of railroad business continues. The flood of western Kentucky, which started two weeks ago, largely on the strength of the fact that railroads and some other big consumers were due to come into the market, gorged, backwatered and partially drowned many of the jobbers who brought a large volume of it into the Chicago region on consignment. Heavy shipments from the mines continue in other directions, however. A gentle demand has begun to develop throughout the Midwest for various coals so that the outlook for selling agencies with Eastern and Kentucky connections is not black. It is merely a dull gray.

Generally speaking, Midwestern companies with eastern Kentucky operations have been enjoying a pleasant time since the strike started. Many non-union mines which began cautiously, fearful lest the light market they found would disappear almost any morning, have been going stronger and stronger, thanks to Lake and steel trade, until now they are working full tilt and selling every ton at a fair profit. With the slow but general upturn of prices, coal from those fields sold through Midwestern houses has made a small section of the coal trade reasonably prosperous.

As for operators with Indiana and Illinois mines, little can be said. They have sold off practically all the fuel stocked at mines at pre-strike prices with a strengthening of the figures on screenings, as that class of coal became scarcer and scarcer. Today the region is practically barren.

Eastern coals have come into the Midwest in quantities always ample to meet every trace of demand. Quotations on smokeless mounted because operators were able to sell so much of their output East that Chicago was no longer a rich objective. During the past week shipments came from new sources because one of the largest Pocahontas operators was closed down. This scattered the business somewhat and gave the surface impression that smokeless business was livelier. Mine run went steadily at various figures from $2@$2.50 and the little lump that was handled brought $2.75@$3.

Peace prevails in most of the mining fields. It is to be noted that some miners' union members are working in thinly scattered numbers at much reduced wages without interference from the union officials. These men are doing the odd jobs of repair and maintenance around mine properties.

CHICAGO

Nothing disturbed the calm of the Chicago coal market during the past week except the travail which certain jobbers suffered in their effort to sell a flood of western Kentucky coal here without taking a loss. A few wise men who booked most of their customers before they bought anything in the field have done comfortably well. Many others, less wise, bought at $2.50 and even as high as $2.75 and sold from $2.50 down to as low as $2.30.

However, there is a gentle flow of business through this market which is swelling slightly. General industrial demand is extremely low but not lying flat on the hard bottom as it was a couple of weeks ago. Steel companies continue to be the leading buyers in small quantities and other industries making staple products are taking a little coal from day to day and protecting their stocks. The coal trade confidently expects the railroads to begin taking a heavy volume soon. Up to date they have only just begun to buy.

A small quantity of smokeless coals reach here daily at prices which remain reasonably stiff, largely because of the absorption of those coals in the East. Dealers are taking a little sized Pocahontas nowadays to satisfy a light demand from householders who are beginning to worry for fear they will not be able to afford anthracite if mining does not resume until fall. Smokeless mine run is quoted here at about $2.25 and lump up to $3.

WESTERN KENTUCKY

Demand continues fairly keen though buyers are fewer. This is due largely to the fact that operators are not quoting prices, or accepting new business, until they dispose of orders on hand, figuring that prices may be higher at time of shipment. As a result about the only quotations available are those of small mines, and quotations on resale offers of jobbers and brokers who are trying to unload large tonnages they contracted for recently.

Reports from the railroads indicate that there is more coal moving out than at any previous time in the history of the industry. On the L. & N., more than 5,000 cars increase was shown in April over March, which was an active stocking month, and April demand did not become heavy until just before the close of the month. From present indications May movement should set a high record.

For the past few days there has been some congestion and difficulty in getting enough cars on the Hazard branch, and also in the Cumberland Valley division of the L. & N.

Western Kentucky is starting its quotations around $2.50@$2.60 for mine run, with screenings at $2.60 and up and lump $2.75@$3. There is some shading. Screenings are in strong demand but light supply. Trade is expected to grow strong again in a few days.

INDIANAPOLIS

Coal on track in Indiana is still without a market. There are no quotations going out on any kind of fuel. Since April 1 no coal has moved in the state except from a few of the wagon mines in the south central part and a little from mines in northern and Western Kentucky. There has been little Indiana demand as yet for non-union coal.

Some of the producers in Indiana have farmed out their best salesmen to the bigger retail coal merchants in an effort to aid in getting rid of present stocks. Several instances are to be noted where men formerly connected with operators' offices here in Indianapolis, now are working with big retail or jobbing institutions until the end of the strike.

SOUTHERN ILLINOIS

Continued quietness prevails in the Carterville field and Duquoin and East Jackson county districts. There is a little coal at a few of these mines, but almost nothing on the open market.

Similar conditions exist in the Mt. Olive and Standard fields. There is still a little coal on hand, but prices are quoted only from day to day. A few cars of domestic sizes are available but no steam, except that unloaded from the Standard field several months ago on the industrial coal roads near East St. Louis, where a few thousand tons of steam sizes were piled up and a little railroad fuel held in the field.

ST. LOUIS

The market is easy with only a little demand for steam sizes here and there. The domestic demand is about gone. A few railroads have been in the market. The Wabash bought, it is understood, about 1,500 cars of Kentucky mine run at from $2.10 to about $2.40. The Frisco bought about 500 cars ranging $2.10@$2.20. The Union Electric Light & Power Co. got in the market for a few hundred cars at slightly above $2. Country conditions are quiet on both steam and domestic, with no demand.

LOUISVILLE

Some railroad inquiries are now being felt in this market and larger rail demand is expected soon. Consumption of the coal-carrying lines in this region is steadily increasing. Not many operators are quoting coal now. They are waiting until they fill orders already booked. The market is so firm that jobbers and brokers do not hesitate in taking on prospect coal offered at anything below the average market.

So far the coal strike does not seem to be affecting industrial demand to any extent. Retailers are meeting with a slightly better stocking demand. Lake movement is better, and the steel and metal working industries are buying more freely. Cement and brick plants are buying well as building supplies are quite active generally.

Northwest

Gen. Dullness Commands Entire Northwest Now

Industrial and Back-Country Call for Coal Is Faint—Shipping to Docks Has Halted But Stocks on Hand Are Good for All Summer.

COAL business is sluggish from the docks as far Inland as water-borne coal ordinarily penetrates. Back-country trade is flat, industries have not revived as it was expected they might by this time and demand generally is extremely light.

The north and west-bound coal traffic which started up moderately with the opening of the Lake season has about died out, so that the supply reaching the docks is small. Evidently most of the cargoes which came up early, were those loaded last fall at Lower Lake ports. However, nobody is worrying, for at the present rate of disposal, the 2,700,000 tons of soft coal and 300,000 tons of anthracite on the docks will last all summer.

DULUTH

Shipments from docks fell off materially during April, according to figures just released. The total was 9,826 cars from the docks at Duluth and Superior, as against 21,249 cars in March this year and 5,831 in April last year. Although the shipments this year are more than last, for the same month, dock men say that this must not be taken as an indication of good trade, as shipments during 1921 were universally small.

Stocks on docks are still at high tide. Estimations put bituminous stocks at 2,700,000 tons and anthracite at 300,000. The most conservative estimators say that the Northwest will not suffer for coal until well into August. The majority opinion is that the coal on docks will last until the fall.

Several docks here have non-union buying connections, and these will bring coal to the Head-of-the-Lakes. Five cargoes, one of which was anthracite have already been received here. Three more have started from Lower Lake ports, and should arrive within a few days.

It was reported early in the season that some of the 35 cargoes loaded for the Head-of-the-Lakes at Lake Erie ports might be diverted to other places. This has happened. Sault Ste. Marie, Port William, Port Arthur, Ashland and other ports have received much of the coal which would have filled the docks here to overflowing.

Large consumers are well filled up The mines on the Iron Range are carrying over coal from last season and will use this as long as possible. The Steel Corporation has sufficient coal on docks to last some time, and the Zenith Furnace has received two cargoes this season, which makes its coal position easy.

The $6.50 price on lump which was mentioned two weeks ago as being made by some docks has become general. Run of pile is down to $6 and screenings are $4.25@$4.75, as quality dictates. This reduction seems to be conceded as necessary to get trade. It is thought that a resumption of the regular scale of $7, will be made as trade improves.

Anthracite is dead, and doubtless will remain so the rest of the summer.

MINNEAPOLIS

The strike has had no effect whatever here yet. It is causing no rush, no apprehension as to future supplies, no disturbance of any kind. There is a reassuringly large amount of coal on the docks. The opening of navigation brought up several cargoes of coal evidently loaded and stored on board over the winter.

Navigation opened about two weeks later than usual, but there was no call to rush operations, since there was nothing pressing to be moved by Lake. The expectation is that this season, in general, will be a much more active one than last. The iron ore production is expected to be double that of last year. This will mean a generally improved commercial situation that ought to be helpful. But if this expectation shall prove true, it will hardly register in the immediate future, nor have its effect upon the coal consumption.

MILWAUKEE

The coal business at Milwaukee continues flat and stale. Dealers report very little business. There is enough coal on the docks to last until fall at the present rate of consumption. Prices were not shaded on May 1, as some expected, and it looks as if there will be no change here until the settlement of the strike furnishes a basis for something different.

Coal receipts by Lake, which started out briskly at the opening of the season, have almost ceased. Sixteen cargoes were received during April, aggregating 8,000 tons of hard coal, and 100,309 tons of soft coal. One of the hard coal cargoes consisted of 700 tons of screenings which was brought down by the C. Reiss Coal Co. from its yards at Escanaba, Mich. Last year twenty-two cargoes were received durng April, the receipts aggregating 43,100 tons of anthracite, and 154,579 tons of soft coal. There have been no coal arrivals thus far in May.

New England

Cargoes on Hand Moving, Prices Show Upward Trend

Market Not Yet Up as Strong as at Roads—Aside from a Few June and July Buyers, Little Business Is in Sight.

A reflection of the stronger prices at Hampton Roads is now noticeable in this market. Cargoes on hand are being moved and quotations show more of an upward tendency than for several weeks, although the market has not yet risen as strongly as at the Roads. There are a few buyers yet to enter the market for a season's supply that usually is bought in June and July. Aside from this there is not much additional business expected for thirty days. The textile strike has removed much buying power that would otherwise be in evidence. Central Pennsylvania coals remain inactive in this territory.

Pocahontas and New River continued to climb upward during the week, especially at Hampton Roads. For two or three days there was every appearance of a flurry, a situation made possible by active demand in the West combined with a certain amount of buying by bunkering contractors at Philadelphia and at New York.

Most New River operations are shut down because of the labor difference, but Pocahontas output increases from week to week and it will soon become an interesting question whether the non-union mines can take care of current demand. If so many ships had not been converted to the use of oil, particularly those sailing from New York, it is probable there would have been a "squeeze" by this time.

For distribution Inland from points like Boston and Providence, there has also been a reaction in prices, but not so pronounced as at the Roads. There are a few buyers who are yet to come into the market for the season's supply that ordinarily is purchased in June and July, but aside from these there is no special demand expected during the next 30 days or so. Quotations at Mystic Wharf, Boston, have advanced sharply during the week from $6.15 to $6.50@$6.75. A few factors are asking $7 at the time this review is written.

Marine freights coastwise remain in easy shape; 90c. is about the going rate on steamers, Hampton Roads to Boston, while on large barges there are occasional charters at rates varying 5c. or so up and down. Smaller barges for light draft points are of course held at rates over $1.

At retail, in Boston, there continues keen competition for what contract business offers. Public institutions have been able to buy this week at $6.68 per net ton delivered, but apparently the wholesale market will soon correct this situation.

Eastern Inland

Industrial Revival Menaced By Strike and High Prices

Connellsville Coal in Demand as Eastern Buyers Reappear — Reserves Shrink, Stronger Call Near — Many Producers Recede from Extreme Wage-Cut Sentiment.

CONNELLSVILLE coal is again in strong demand, following the reappearance of Eastern buyers. Screenings are in very short supply as the lump market continues to lag.

Fear is expressed that the business recovery which is under way may be set back by a continuance of the coal strike. Reserves are melting and a stronger call is not far away. When it comes, the industrial revival will certainly be checked if coal prices are not reduced. This is causing a reversal of sentiment among many operators from the extreme wage-cut ideas originally held. Much of the Lake coal is going to Buffalo furnaces instead of to the Northwest.

CLEVELAND

Some leading operators are beginning to take an energetic stand for the opening of negotiations with the union. They believe that the strike should be called off and production resumed by June 1. Business recovery is under way and will continue to gather momentum unless the brakes are applied by too long endurance of the coal strike. In some quarters there is strong expectation that before long an invitation for a conference will be received from the union camp. If it comes there will be a demand for its acceptance.

Another interesting development has been the reversal of sentiment among many operators from the extreme wage cut originally suggested. Most of them now admit that any reduction that is obtained will be considerably smaller than at first considered possible.

Demand remains rather subdued. Most industries are believed to be near the fag end of their stocks, however, and difficulties are going to be met in obtaining fuel supplies before long.

Up to May 1, 823,000 tons of coal had been loaded at Lower Lake ports. This was about 400,000 tons behind last year's record.

PITTSBURGH

Appearance of buyers from the East has stiffened the Connellsville market, following its softening some ten days ago, and the market has been advancing by stages until at this writing it can be reported firm at $3, or up to the level of about three weeks ago.

Connellsville coal is the chief thing in the Pittsburgh market. There is no Westmoreland coal, except for an occasional offering of gas coal at $3.50 or higher, which does not interest consumers. The strip-mined coal on the Panhandle continues a factor as formerly. Its price is higher, $3.50 being obtained for lump and $3.25 for slack, against $3 ruling until recently. The coal is screened with a 1¼-in. screen, about half going through.

Most reports are that the production of coal in the general Connellsville region, whether coked at the mine or shipped, has been increasing somewhat in the past week or two, but it is far from certain this is the case. Some men have straggled back to work, but at some mines in operation the working force has decreased. No additional mines have been closed for more than a week. There are, of course, no developments in the regular union strike, and none are expected for weeks to come. When a mine is entirely idle, small groups of men applying for work are advised to secure more recruits so as to make it pay to open the mine.

COLUMBUS

With an appreciable increase in the demand the market has developed considerable strength. Prices are at the highest point of the year. The strength is most apparent in mine run, egg and screenings while lump is not sharing in the strength to any marked degree. In fact, lump and mine run are now at a parity in most of the fields while screenings are quite scarce and practically out of the market.

A considerable tonnage from West Virginia and Kentucky is now coming into the market. All of the coal mined previous to the suspension in Ohio fields has been cleaned up and thus fuel from the non-union fields is commanding a higher price. Logan County is producing a large amount and certain fields in Kentucky are also busy.

Indications point to a more active Lake season than was at first expected. Reports from the upper region show that a considerable tonnage is now being sold. It is believed that the Lake season will open actively in June as a good tonnage will be shipped to the Northwest.

EASTERN OHIO

In many cases, stock piles have been bolstered by purchases of non-union coal which is available in the spot market sufficient to meet all demands. The stripping mines continue to operate without any interruption and it is conservatively estimated that these mines are producing about 30,000 tons per week. However, there have been some cases of interference where union miners have marched upon certain stripping properties, and the employees persuaded to discontinue work.

A slowing down is reported in the Lake trade, with a little less than 1,000,000 tons of coal already dumped into boats at lower docks. This shipping during recent weeks has been principally from non-union mines in West Virginia and eastern Kentucky to Toledo and Sandusky, total number of cars on track at lower docks being placed at 5,200; dumpings are averaging around 700 cars per day.

Spot prices have shown some tendency to stiffen during the week and eastern Ohio stripping coal is quoted f.o.b. mines; slack, nut and slack and mine run, $2.85@$3.10; these same grades from non-union mines in West Virginia and Eastern Kentucky are quoted at from $2.15@$2.60.

Receipts of bituminous coal at Cleveland during the week ended April 29 were 962 cars; 841 cars to industrial concerns and 121 cars to retail yards, an increase of approximately 250 cars over the preceding week. Average weekly receipts during the first three months of the year were 1,512 cars per week. Current arrivals, coupled with reserve stocks on hand, have so far afforded an ample supply.

BUFFALO

Demand is so light that the prospect is good for a long holding out. Consumers are indifferent so that there is hardly any market at all worth the name. A few sales have been made at small advances. but as a rule the consumer is prepared to shut down rather than do anything that would encourage a general advance. The output is increasing and coal on the market is in excess of the demand.

Jobbers join the consumers in repudiating the asking prices of a dollar advance and do not seem to think that it will come up to any such figure. At any rate it is useless to urge much higher prices now. So all that can be done is to wait till the tension of the strike becomes more severe, then the weaker party will give way.

A fair quotation, bearing in mind that prices are varying widely, would be $3.50 for Youghiogheny gas lump, $2.75@$3 for Pittsburgh and No. 8 steam lump, $2.50 for Allegheny Valley and other mine run and $2.25 for slack.

DETROIT

About the only encouraging feature in the market is an improved demand from steel companies and an increasing number of inquiries from railroads. Among the general industrial buyers there is a continuance of the lack of interest that has been a marked characteristic ever since the beginning of the mine workers' strike.

Fine coal is particularly scarce at present. This condition being due not so much to consumption as to a diminuition in the quantity being produced at the mines, owing to reduction in sales of lump.

Purchasing by household consumers has practically been discontinued for the present. Dealers are holding larger stocks than the owners regard as desirable at this season of the year, with the possibility of a reduction in railroad freight rates in the foreground.

Smokeless lump and egg is $2.75@$3, mine run is $2.40 and nut, pea and slack, $2@$2.25. Mine run from eastern Kentucky is $3. West Virginia lump is $3, mine run, $2.50@$2.65, nut, pea and slack, $2.40.

NORTHERN PANHANDLE

A discreet silence is being maintained by operators as to developments. More than 50 per cent of the mines are continuing, despite the utmost efforts of the U. M. W. to close down all workings. There have been a number of evictions in order that company houses may be utilized for men willing to work.

Cincinnati Gateway

Market Prices Holding Up Coal Moves in Large Volume

Steel Mills Place Orders with Producers—Some Wholesalers Left Long on Tonnage—Heavy Buying by Large Users Stiffens Smokeless Quotations.

NEW buying tactics employed by the steel mills proved a quieting market influence last week. Orders are now being placed direct with some of the larger producers, and this has left a few wholesalers long on unsold tonnage. There has been no drop in market prices and coal is moving in larger volume than at any time since the strike began. Some smokeless producers have already sold their entire May output.

Heavy purchases of smokeless coals by railroads and other large buyers has stiffened that market. The general line demand also is improving at points to the north of this gateway, noticeable here for the first time since the strike began. Southeastern Kentucky prices rose to a better Western and railroad demand.

HIGH-VOLATILE FIELDS

KANAWHA

Production is still greatly limited. A large number of miners who have been on strike for the last month want to go to work but the large companies have told their men that when as many as 80 per cent evince the desire to do so then operations will resume. Mine run is now $2.50, with many large consumers seeking tonnage.

LOGAN AND THACKER

In markets reached by Logan products there was a perceptible stiffening during the closing day of April, resulting in further increases in production to approximately 60,000 tons a day. Steel companies are securing as much as 50 per cent of the output. The strike is not affecting conditions except to stimulate production. Prices are advancing although there is no such bidding as featured the middle of April.

With demand increasing, Thacker mines are shipping more coal. Demand is somewhat heavier in Western markets and more coal is being consigned to the Lakes. Railroads too are taking more. Although the tent colonies remain, the U. M. W. has been able to make no headway in bringing about a strike in Mingo.

NORTHEASTERN KENTUCKY

There were further increases in the demand during the week ended April 29. This stimulated production to about 25,000 tons a day. There are now no unbilled cars in this district. Not only is there a heavier demand at the Lakes but also in many Western markets. Tonnage losses due to the strike are negligible.

CINCINNATI

Steel mills have switched their purchases to direct deals with the large producers. Wholesalers and others had to be content with a range of $2.50@$2.75 for gas coals last week and some of it, getting on to demurrage, was offered and sold around $2.40. Steam grades were not nearly as active as they had been and some splints even sold below the $2.40-mark.

Miners seem to be bending toward their work better and there has been a steadier flow of cars through this gateway for the past ten days than at any time during the recent unpleasantness. Demand and prices at Toledo and Cleveland have stiffened. This is the first time in four weeks that the local price pulse has been reflected in other markets.

Heavy purchases made by the Pennsylvania of Pocahontas coals and other tonnage of quantity have stiffened the smokeless market. Lump held the advance scored late last week and prepared sizes are scarcer because of the large volume of coal that is being turned in as straight mine run.

Retail dealers are still fussing around with proposals of raising the price because of the advances that have been scored by the wholesale market. Smokeless lump is still quoted $7.50@$7.75, however, and mine run is $6.50. Bituminous lump is $6.25@$6.50 and slack, $4.75@$5.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

During the closing days of April New River prices stiffened to some extent with mine run quoted at $2.10 in Western markets and with lump also showing a tendency to advance. Approximately 40 of the 119 mines are in operation. The injunction in effect is expected to encourage men to return to work. More mines could be operated, producers assert, if there were a better demand.

The status of the Winding Gulf region is now about normal. The temporary injunction having been made permanent, there is reason to believe that this region will not be further affected by the strike. A larger production is impossible under existing market conditions. Mine run is gradually increasing in price, however, and now ranges $2.10@$2.25.

POCAHONTAS AND TUG RIVER

Pocahontas production is on a larger scale than ever, loadings amounting to as much as 76,000 tons a day. Producers are quoting $3 on lump for May and little mine run can be obtained at a price lower than $2.20.

Without any outside interference, Tug River mines continue to produce a normal volume, the daily output fluctuating between 15,000 and 17,000 tons, much of which is going into Western territory and particularly to the Steel Corporation and similar industries. Transportation and labor conditions are favorable to a large production. With the demand a little better prices have hardened.

SOUTHERN KENTUCKY

After several days of weakness caused by the temporary withdrawal of buyers representing steel interests, demand is coming back strong and prices are firm. Production continues at the rate of about 75 per cent of potential capacity, there being a great deal of loss account of car shortage.

There is practically no change in the labor situation in Harlan and Bell counties. Several more mines that have been down for some time are starting up, and while working at a minimum, are steadily recruiting labor and are having no trouble from labor agitators.

South

VIRGINIA

Further gains in production were recorded during the closing days of April, when there was a production of about 71 per cent. In some sections production was as high as 78 per cent. C. C. & O. mines were producing at about 74 per cent. Heavier demand in the East is responsible for the increased loading, at least as to mine run and slack.

BIRMINGHAM

The market is just beginning to feel the effects of the strike. Although as yet developments have been more in the nature of inquiry than in the actual placing of business. Indications point to satisfactory business materializing from outside territory very shortly. Demand in local territory is still meager and insufficient to maintain more than a 50-per cent schedule at commercial mines.

The Seaboard Air Line Ry. has closed contracts for all but a small portion of its fuel for the next year. The L. & N. and the Atlantic Coast Line have also closed contracts the past week. Few industrial contracts are being negotiated.

The domestic trade is easy and there is no active demand. Mines are managing to dispose of output on present basis of operation, but considerable effort is necessary to place business. Quotations on commercial coal have undergone no change of note for several weeks, prices being practically at rock bottom, but with the development of an active market they will probably stiffen to some extent:

	Mine Run	Washed
Cahaba	$1.85@$2.25	$2.00@$2.25
Black Creek	2.00@ 2.40	2.25@ 2.50
Corona	1.80@ 2.00	2.00@ 2.25
Pratt	1.75@ 2.00	1.90@ 2.25
Carbon Hill	2.00@ 2.25	2.00@ 2.25

Lack of orders at commercial mines has resulted in a reduction in output, which, for the week of April 22, totaled 275,000 tons. Production at furnace mines is steadily increasing, there being a heavy demand for furnace coke and also a more active market for foundry coke than has prevailed for some time.

News From the Coal Fields

ALABAMA

Governor Kilby has appointed for another term as assistant state mine inspectors **E. E. Echols**, of the first district, and **S. M. Thompson**, of the fourth district, whose terms recently expired. There were a number of applicants for the positions.

The State has made a trial contract with David Roberts, trustee of the **Montevallo Mining Co.**, for the use of convicts in the mining of coal at its Aldrich operations during May, a minimum of 225 convicts to be used at prices paid by the company prior to the receivership in February, since which time the convicts have been held in idleness at the State stockade. If the company can use convicts advantageously under present conditions the contract is to continue in force, otherwise will terminate June 1. It is understood that the State's action does not prejudice its rights in the suit now pending in the Federal Court of Appeals for the restoration of the contract existing prior to the bankruptcy proceedings.

COLORADO

A railroad from Wamsutter, Wyo., through the Snake River Valley to tap the rich coal fields in northwestern Colorado is to be built this spring, according to an announcement in Washington, D. C., by E. M. Reader, of Baggs, Wyo. The necessary money has been provided and work will start this spring. The new railroad will make these rich coal fields tributary to Wyoming, rather than to Denver.

ILLINOIS

The Murphysboro Mining Co., is the name of a new coal company recently organized and incorporated at Springfield, by Jackson County mining men. The home of the new company is at Vergennes. The capital stock as recorded at Springfield is $20,000 and the incorporators are E. A. Doerr, J. O. Doerr and Frank Scholes.

C. M. Moderwell, president, and **Charles E. Pennington**, sales manager of C. M. Moderwell & Co., spent a week in April on an Eastern trip. Mr. Moderwell then went to Tryon, N. C., on a vacation.

Thomas H. Cochran, president of the Ender Coal & Coke Co., of Chicago, was a visitor in New York recently.

The St. Paul Mine, at Cherry, has been ordered closed and the outlook for the town, which was the scene of the great mine disaster twelve years ago, is not promising. The company has given orders to dismantle the mine and the work of removing the equipment has already begun. The mine and the town have not been the same since the great disaster. As soon as the fire was out the company made repairs and attempted to resume operations, but the miners began to seek employment elsewhere and superstitious persons in Cherry prevented others from coming in. Mining men acquainted with the Cherry Mine state that the workings are in the best condition possible and that the mine has an estimated capacity of 2,000 tons a day. The St. Paul company has mines at Mark and Granville and the closing of these may follow the abandonment of the Cherry Mine.

Homer D. Jones, president of the Western Fuel Co., of Chicago, enjoyed an April vacation at French Lick, Ind.

F. A. Manley, general manager of the O'Gara Coal Co., at Chicago, and **F. A. Braselton**, sales manager, spent part of April on an Eastern business tour.

E. R. Keeler, sales manager of the Taylor Coal Co., has returned to Chicago after a vacation in the South.

INDIANA

The Francisco Mining Co., at Princeton, has under construction a series of dams to convert a part of the old canal bed there into a lake. From this lake water will be supplied by a pumping station to the mines of the company. The main dam will be high enough to hold the water at an average depth of twenty feet.

Judge A. B. Anderson, of Federal Court, in Indianapolis, has named James A. Cooper, an attorney of Terre Haute, as receiver for the **Rowland-Power Consolidated Collieries Co.**, of Terre Haute, on a petition filed by Walter S. McCloud, of Wellston, Ohio, who listed his claims against the company at $4,229.38. Mr. McCloud, who filed the suit in behalf of other creditors, alleged that the defendant company owed $675,000 on bonds issued and that it owed $45,000 to laborers and mechanics. The defendant company on Oct. 1, 1919, authorized the issuance of $1,000,000 first mortgage six per cent bonds. The company, in an answer to the petition, admitted insolvency.

KANSAS

James Reed, mayor of Weir City, and others have taken over the old Lecoq strip mine near Coalvale.

Coal mines in Kansas in 1921 produced 4,028,624.22 tons of coal, a decrease of 31 per cent from the preceding year. There were 10,416 employees, of whom 6,897 were miners, 2,003 underground day men, and 1,516 top men. The average number of working days was 151, while the average the year before was 202. There were fourteen fatal accidents during last year, the smallest in percentage since 1897, while there were 740 non-fatal accidents.

KENTUCKY

The Louisville & Nashville R.R. has issued circular G. I. S. No. 141, dated March 25, 1922, showing the location and capacity of all the mines and coke ovens on the line of that road.

The two Southland Company mines at Henderson have resumed operations on full time. The company received orders from Chicago and the Northwest for enough coal to keep the mines in operation for at least two months and additional orders are expected which may give work to the miners through the summer.

The McAuliffe Coal Co. has filed articles of incorporation with a capital stock of $30,000 and a debt limit of $100,000. Incorporators, with three shares each, are Lucille Harlan, Frank B. McAuliffe and Tim B. McAuliffe.

The National Coal & Industrial Association, capital $100,000, has been chartered at Somerset by Dr. Will L. Taylor, F. B. Lackey and W. B. Wood.

The Eastern Star Mining Co., capital $50,000, debt limit, $50,000, has been chartered by A. N. Shrader, W. D. Collins and D. C. Collins.

MARYLAND

Receipts of anthracite in Baltimore for the coal year show that the actual deliveries were in the neighborhood of 573,345 tons, whereas the normal consumption of the territory is always in excess of 650,000 tons. The low consumption of the past fall and winter period is thereby sharply indicated, and bears out the belief of hard coal men as expressed last fall, when the city was about 120,000 tons short of normal receipts, that a hard winter would bring famine-like conditions. The Baltimore Coal Exchange compiled the following data:

BALTIMORE RECEIPTS OF ANTHRACITE

Date 1921	Penn. R. R. Cars	B. & O. R. R. Cars	Western Md. R. R. Cars	Total Cars
April	612	259	123	994
May	702	270	130	1,100
June	829	331	150	1,310
July	734	329	119	1,082
Aug	396	199	126	721
Sept	480	210	126	816
Oct	621	249	171	1,041
Nov	606	197	162	965
Dec	653	214	174	1,041
1922				
Jan	699	154	209	1,962
Feb	934	184	208	1,326
March	873	230	171	1,247
Total	8,146	2,726	1,869	12,741

MISSOURI

The Kansas City-Midland Mine No. 4, Novinger, has been abandoned. Heavy upkeep during the strike period with little available coal left decided this. It produced about 1,000,000 tons in its eight years of operation.

The Southwestern Interstate Operators' Association has compiled a statement relative to the cost of various southwestern mine strikes. A total of 1,873 separate strikes in the 69 months from April 1, 1916 to Dec. 31, 1921, caused a loss of 1,609,041 one-man working days to the miners of District No. 14, a total wage loss of $10,552,757. The greatest loss was in 1921 when strikes on account of Howat and Dorsey's trial and their sentence resulted in a loss of 615,847 one-man working days and $5,506,398 in wages. From April 1, 1916, to Dec. 31, 1918, the wage loss was $3,866,820, while for 1920 it was $1,179,528.

In 1895 the **Kolb Coal Co.** was organized with $6,000. Four stockholders put in $1,500 each. Up to ten years ago they acquired with that capital and the earnings two mines at Mascoutah, and two near New Athens. They recently sold out to **C. C. Field** and **F. H. McCauley**, of New York, and others for $1,200,000.

Reports that **Denk Bros. Coal & Coke Co.**, of St. Louis, were to abandon Mine No. 3 at Troy were premature. It is an old mine and is pretty well worked out. The only coal in the Fifth and Ninth District graded by the Fuel Administration as the equal of Carterville was from this mine.

NEW YORK

That the gas and electric companies in Greater New York and vicinity continue to be well supplied is shown by a report of the tonnage on hand as of April 30. At that time the Brooklyn Edison Co. had on hand 613 tons of anthracite and 86,202 tons of bituminous, while the New York Edison Co. had 12,497 tons of anthracite and 240,119 tons of bituminous. Other tonnages were: Brooklyn Borough Gas Co., 1,653 tons of anthracite; 2,272 tons bituminous; Brooklyn Union Gas Co., 120,223 tons anthracite, 2,247 tons bituminous, Consolidated Gas Co., 190,150 tons anthracite; 189,262 tons bituminous; Westchester Lighting Co., 30,599 tons anthracite and 7,977 tons bituminous.

The Island Creek Coal Co. reports net profits for the first quarter of 1922 after depreciation, depletion and Federal income taxes of $760,496. This is equal, after preferred dividends to $5.77 a share on the common stock.

The Pond Creek Coal Co. reports net profits for the quarter of $95,296, after depreciation, depletion and Federal income taxes.

NORTH DAKOTA

The Velva Coal Products Co., J. W. Bliss, general manager, is understood to be making plans for the development of a lignite mining project, which entails the expenditure of several hundred thousand dollars.

OHIO

M. F. McDermot, president of the Boone Coal Co., of Cincinnati, was called to Pittsburgh recently by the death of his mother. He was formerly a resident in that city until he took charge of the Amherst Fuel Co.'s Cincinnati affairs five years ago.

D. W. Riddle, of the Riddle Coal Co., Chattanooga, Tenn., was in Cincinnati recently looking over the affairs of his branch office.

The Executive Committee of the Lake Carriers' Association has announced a uniform wage reduction of $5 per month for the several grades of unlicensed seamen on the Great Lakes for the 1922 season.

Frank B. Stewart, president of the Winifrede Coal Co., after a visit to headquarters in Cincinnati has returned to the East and after looking over the situation at the mines in West Virginia continued on to Philadelphia to lay the strike situation before his board of directors.

Lake H. Bobbitt takes charge as manager for the Ft. Dearborn Coal Co. in Cincinnati. Mr. Bobbitt was with the Wood Morton Fuel Co. before it was merged with the Ft. Dearborn. He formerly had charge of operations and sales for Quin Morton's properties at Charleston.

The H. Walker Coal Co., Tiltonville, has been chartered with a capital of $200,000 to mine coal. Incorporators are Henry Walker, Joseph Bainbridge, Harry J. Merkel, Henry G. Verholt and Raymond B. Ritson.

Stripping coal at the mine of the **Wayne Coal Co.**, near New Lexington started late in April and during the first three days' operation a total of 50 cars were loaded. No trouble with the striking miners has yet taken place.

Holders of interests in the **Allied Power Industries**, a $10,000,000 trust estate of Columbus, which was forced in the hands of Barton Griffith, Sr., as receiver four months ago, are trying to raise the money necessary to pay off the indebtedness and lift the receivership. The liabilities are approximately $50,000 which is figured as an assessment of 3 per cent on the interest holders. In the meantime the coal property has been idle.

OKLAHOMA

Most of the coal mining properties in the vicinity of Henryetta are in good condition, extensive repairs and improvements having been made during the slack period before the strike. However, advantage is being taken of the idle time and the mines are being renovated and put in condition for a rush when the strike is settled. **The Crowe Coal Co.**, and the **Cherokee Fuel Co.**, the two largest operators in the Henryetta field, have removed their offices to the Elks Building. These companies have also organized sales and advertising departments. **The Warden-Pullen Co.** has completed the new tipple at its mine and laid tracks for loading and switching cars.

PENNSYLVANIA

A new coal field is being opened up near Delmont by **J. B. Johnson**, of Scottdale, who has bought a tract of land, and is taking out the coal by stripping. One big steam shovel is already at work.

Provided the constitutionality of the tax is upheld the income to the state from the anthracite tax during the last six months of 1921 was $3,150,799.65, according to operators' coal reports filed with the attorney-general at Harrisburg, in compliance with the terms of the act.

The Hudson Coal Co. has filed notice of an increase in capital stock from $15,736,250 to $16,134,250. R. C. Kann, New York City, is treasurer.

The Bostoph Coal Co. has increased its indebtedness from $5,000 to $10,000, Isaac Deisher, president and treasurer, Birks County.

How money comes round to him who waits, sometimes, is exemplified in the case of P. Bufano, of Connellsville, who has disposed of his interest in the surface of a tract of 524 acres of land near Ohiopyle. Coal, timber and surface, sold at different times, for which Mr. Bufano paid $1,100 in the aggregate, brought him $16,100. The land was sold to the **East Fayette Coal Co.**

W. B. Calverley, formerly president of the Union Collieries Co., has disposed of his interests in that concern. He still retains his affiliation as president of the Fayette Coal Corporation and the Central Youghiogheny Coal Co., with offices in Pittsburgh.

An old boiler house containing one boiler was destroyed by fire at the Continental Colliery of the **Lehigh Valley Coal Co.**, at Centralia, late in April. The damage was slight as the building was of wood and the boiler abandoned.

The management of **The Pendleton Coal Co.**, has been taken over by the **Finance and Fuel Corporation**, DuBois.

The X. O. Werder estate, containing approximately 4,600 acres of land, underlaid with 2,000 acres of two veins of Kittanning coal has been purchased from Mrs. Werder and other heirs by the **Marion-Westmoreland Collieries Co.**, of New Florence, a recently organized concern. H. W. Payne of Pittsburgh is president of the company. The consideration is said to be around $250,000. The Werder estate has been operating a small mine, using a narrow-gage road, since 1917. The new company plans to put in a standard-gage road and equip the mine with all modern conveniences.

The Mason-Adams Coal Co., J. W. Mason, Philadelphia, president, has notified the State Department of an increase in capital from $39,600 to $40,300.

TEXAS

Agents for **Peale, Peacock & Kerr**, a concern operating coal mines in the vicinity of St. Benedict, Pa., recently visited Dallas and placed orders for seventy-five pneumatic separators or air tables manufactured by a Dallas firm. Other large concerns have recently placed orders and the use of the machine is spreading rapidly.

VIRGINIA

W. W. Gardiner, president of the Chesapeake & Virginian Coal Co., of Lynchburg, left Cincinnati for the meeting of the Newport News Coal Exchange early in May. Another from Cincinnati to attend the meeting was **W. J. Magee**, of the Carbon Fuel Co.

The only coal contract let at Norfolk recently was for the Shipping Board's requirements during May and June. No amount was specified in the contract, although 68,000 tons per month has been the normal consumption. The Fort Dearborn Coal Co. got the contract for $4.70, and other bidders, and their bids, were: Crozer-Pocahontas Coal Co., $4.80; Robert Hasler & Co., $4.81; Kanawha-Fayette Coal Co., $5; Eastern Coal & Export Corp., $5.25 for May and $5.50 for June; Dexter & Carpenter Co., $5.30; Leckey Coal Co., $5.50; West Virginia Coal Co., $5.93, W. C. Atwater & Co., current market prices.

WASHINGTON

F. B. Dodds, receiver of the **Colville Valley Coal Co.**, has been instructed to sell the property of the concern May 28. The property includes the mine and 200 acres at Valley.

Settlements made between **Alexander Polson and G. A. Alexander and others** of Bellingham together with the filing of mortgages totaling $56,000, assure the uninterrupted development of the Glacier coalfields, said to be the richest on the Pacific coast. The Glacier fields have been tied up in the courts for more than five years.

WEST VIRGINIA

Eviction proceedings have been instituted before Justice W. M. Riggs of Moundsville, Marshall County, in the Northern Panhandle District by the **Mineral State Coal Co.** to secure possession of company houses now occupied by about thirty families, the heads of which ceased work when the strike began. This company resumed operation at its Parr's Run mine on April 17 after making repairs to its cages.

Coal lands on the northern branch of the Potomac in the upper Potomac District will be developed by the **North Branch Coal Co.**, which has just been organized by business men of Piedmont and Gormania. This company is capitalized at $60,000 and its general headquarters will be at Piedmont. Principal figures in the new concern are John M. Fahey, P. H. Fahey, of Piedmont; D. C. Ridings, W. G. Stine and W. R. Fishel, of Gormania.

R. M. Lambie, chief of the Department of Mines of West Virginia, was a recent visitor in Clarksburg, delivering an address at the meeting of the Clarksburg Mining Institute. From Clarksburg he went to Pittsburgh for a few days sojourn.

The New River Co., operating in the New River field has filed notices of unlawful detainer against Alex M. Martin and others who not only refuse to give up company houses occupied by them but to return to work. The men against whom notices have been filed have agreed, however, to vacate the company houses in the near future.

George S. Brackett, secretary of the Northern West Virginia Coal Operators' Association, was a visitor in the Washington and Baltimore markets during the latter part of April.

Col. W. M. Wylie, vice-president of the Kanawha Operators' Association and general manager of the Boone County Coal Corporation, was at Charles Town, attending the trial of the "armed marchers." Col. Wylie being a witness for the state.

If upon investigation it should prove feasible, the **Lake & Export Corporation**, of Huntington, will undertake the development of a tract of coal in the Government Naval coal reserves of Alaska, a concession having been granted by the Government. Negotiations have been under way for some time between the company and the Department of the Interior.

The Elk River Coal & Lumber Co., operating at Widen, has appointed L. M. Humrichouse as its Eastern sales manager, according to an announcement just made. This company was formerly represented at Philadelphia by Ernest Law & Co.

WISCONSIN

The dock of the **Reiss Coal Co.**, at Superior, had the honor of receiving the first cargo of coal at the Head-of-the-Lakes this season. It was necessary for the ship carrying the coal to buck her way through a thick coating of ice to reach harbor. Following this delivery, the **Northwestern Fuel Co.** received two cargoes. These arrived a day later and experienced less difficulty with the ice than the first shipment.

Fire partially wrecked the office of the **Callaway Fuel Co.**, Milwaukee, causing only a small loss, but messing up things generally.

BRITISH COLUMBIA

The White Lake Coal Co., which is engaged in the exploration of coal lands in the Osoyoos District, is meeting with satisfactory results. One drill hole is reported to have passed through seven seams of coal in a depth of 355 ft., while in another, lower down in the dip, two of the seams increased to 3 ft. and 4 ft. respectively of clean coal. The coal is classified as semi-bituminous of high quality. The property is to be equipped shortly for the production of from 100 to 500 tons a day.

WASHINGTON, D. C.

Application has been made to the Supreme Court by the **Spring Coal Co.** for a review of the decision of the Superior Court of Massachusetts in its case against the Bethlehem Steel Co., involving sale of coal under prices fixed by the Fuel Administration. The coal company lost its case in the lower court. It contends that the steel company concealed from it the fact that 20,555 tons, which were supplied to the steel company under contract, were for foreign bunkering or export, having been exported to Cuba, and that the coal company was entitled to $1.35 a ton extra under the Fuel administration prices which allowed this extra cost for coal for foreign bunkering or export. The lower court in deciding against the coal company held that the coal was not sold or delivered for foreign bunkering or export.

In a bill in the Senate the creation of a new National Park in New Mexico covering the Mescalero Apache Indian Reservation, the Elephant Butte Reservoir and the White Sands and Mal Pais Lava Beds is proposed by Senator Bursum of that State. The bill stipulates that the mining laws, including the leasing act, shall not be abrogated by creation of the park as to the lands embraced therein and that coal deposits on the Indian reservation may be leased or worked for the benefit of the Indians. It is also provided that the act shall not interfere with the use and development of electrical power incident to the discharge of water from the Elephant Butte Reservoir.

The United States Civil Service Commission announces an open competitive examination for laboratorian on (**Chemical, Physical, Engineering**), on June 21-22, and Aug. 9-10. Vacancies in the Federal classified service throughout the United States, including the Departmental Service, Washington, D. C., at $1,200 to $1,500 a year, or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. Appointees whose services are satisfactory may be allowed the increase granted by Congress of $20 a month.

Traffic News

In the complaint of the **Northern States Power Co.**, the commission has authorized the Watertown, S. D., Chamber of Commerce to intervene, the case relating to rates on fine coal from points in Illinois, Indiana and Kentucky to Sioux Falls, S. D.

The I. C. C. has suspended until Aug. 31 the proposal of the Denver & Salt Lake R.R. to increase rates on soft coal from Curtis Mine, Col., to points in Colorado, Iowa, Kansas, Missouri, Nebraska, South Dakota and Wyoming by 13½c. per ton.

That coal rates from the Jellico-Middlesboro field to Louisville should be reduced from $1.90 to $1.25 a ton in order to compete with western Kentucky operators who have a rate of $1.40 for approximately the same haul was the contention of the **Southern Appalachian Coal Operators' Association** in a complaint against the Louisville & Nashville, by an I. C. C. examiner at Knoxville.

The Traffic Executive Committee, Eastern Territory, is superseded by the **Traffic Executive Association—Eastern Territory,** 143 Liberty St., New York.

The Pure Oil Co., of Columbus, Ohio, has complained to the I. C. C. against unreasonable rates on an intra-plant switching movement of coal.

The Big Mandy Coal & Mining Co., of Cincinnati, alleges unreasonable rates on coal from its mines on Lenox Road to points in central freight association territory to Cincinnati and points in the Cincinnati switching district.

The McKinney Steel Co., of Cleveland, alleges unreasonable rates on coke from Fairmont, W. Va., to Josephine, Pa.

In the hearing on bunker coal rates, before the Interstate Commerce Commission, shippers asked that lower rates be allowed for bunker and export coal than for coal for use in the port. For the Alabama Mining Institute and the Alabama operators, S. L. Yerkes sought to exact a promise from a representative of the L. & N. that it would establish, if the commission permitted lower rates on bunker coal, an adjustment for Alabama operators as is in effect at Charleston. The railroad representative said the matter would be considered. John Callahan, of the National Coal Association, stated that any change in the present arrangement would have an adverse effect on the export coal business and that lower rates for coal going beyond was not a discrimination against port users. A. E. Beck, of the Merchants & Manufacturers Association, W. L. Andrews, of the Consolidation Coal Co., and W. E. Miller, of the Baker-Whitely Co., all of Baltimore, went on record as being opposed to any change in the present arrangement at Baltimore, and stated that large amounts of money were about to be expended in port facilities, which would be adversely affected by any change in the present arrangement at that port. W. W. Houston and H. C. Wade, representing the Maritime Exchange of Norfolk and the Chamber of Commerce of that City, told the Commission that coal going beyond, whether for bunker purposes of for export, should be given the benefit of a lower rate. At the conclusion of the hearing it was agreed that a statement on the subject by Secretary Hoover would be admitted to the record. The Secretary has been very much interested in this subject because of the fact that much export coal business has recently been lost to England, which he attributes to our rates. The Commission has taken the whole matter under advisement and will render a decision in the near future.

The New Jersey Zinc Co., of N. Y., alleges unreasonable rates on coke from Everett, Mass., to Hazard, Palmerton, and Aquashicola, Pa.

The U. S. Coal & Coke Co., New York, alleges unreasonable rates on large shipments of materials from various Pennsylvania points to Lynch, Ky.

The I. C. C. has dismissed the complaint of the **Northern West Virginia Coal Operators' Association** which alleged that the practices of the Pennsylvania and the Pittsburgh & Lake Erie roads from March 1, 1920, to Jan. 1, 1921, in the distribution of coal cars to mines on the Monongahela and the Morgantown & Wheeling were unreasonable in that they constituted preference to competing operators on the Pennsylvania, central region, and the Lake Erie. The commission holds that the practices complained of were not unreasonable or prejudicial.

Trade Literature

Chicago Pneumatic Tool Co., Chicago, Ill., has published a four-page folder on Little Giant coal drills, showing the drills in operation in a coal mine in Alabama.—Advertiser.

Marion Steel Bull Wheels, Calf Wheels, Steel Band Wheels and Steel Tug Rims. Marion Machine, Foundry & Supply Co., Marion Ind. Bulletin 525. Pp. 4; 8 x 11 in.; illustrated.—Advertiser.

Marion Steel Turnbuckle Derricks. Marion Machine, Foundry & Supply Co., Marion, Ind. Bulletin 530. Pp. 8; 8 x 11 in.; illustrated.—Advertiser.

Uehling Co. Equipment. Uehling Instrument Co., Paterson, N. J. Bulletin 112, Pp. 12; 6 x 9 in.; illustrated. Among the equipment described for making fuel savings possible are a "Pyro-porus" filter for keeping the gas sampling lines clean, separate recorder for the engineer's office, indicator for mounting on boiler front, and dry method of absorption.

Obituary

Walter W. Masters, long connected with the Glen Alum Fuel Co. and its Cincinnati office died at his home in that city on April 28. Mr. Masters was stricken while in Columbus and his case was diagnosed as acute Bright's disease. He was buried in his old home at Sardinia, Ohio.

Eugene DuBose Reynolds, retired coal operator, died late in April at Daytona, Fla. Mr. Reynolds was president for a number of years of the Blocton Mining Co., Hills Creek Mining Co., and organized and was president of the Summitt Coal Co. for a time. He was also formerly president of the Blocton Savings Bank. He was a graduate of the University of Alabama and was well known throughout the district. Interment took place at Montevallo, Ala.

Thomas Little, former superintendent of the Big Muddy Coal & Iron Co., mines at Herrin and Murphysboro, Ill., died recently in Mayo Bros. hospital, Rochester, Minn. He was widely acquainted in southern Illinois, having held the position as state mine inspector several years ago.

W. H. Armstrong, formerly coal director for District 18, (Eastern British Columbia and the Province of Alberta), died recently in Vancouver, B. C. He was a highly respected mining man and contractor.

Publications Received

The following publications, which have recently been issued, are obtainable from the Bureau of Mines, Washington, D. C.:

Serial 2319, "Prevention of Illness Among Miners."

Serial 2321, "Mine Timber Preservation."

Serial 2325, "Fighting a Mine Fire with Its Own Gases."

Serial 2334, "Fatalities at Coal Mines in February, 1922."

Serial 2328, "Physiological Effects of Exposure to Low Concentrations of Carbon Monoxide."

Serial 2320, "Performance of Fan-pipe Installations in Metal Mines."

Serial 2326, "Platinum."

Serial 2327, "Soapstone."

Serial 2333, "Epsomite."

Serial 2335, "Tests of Hand Extinguishers on Zinc-Dust Fires."

Serial 2336, "Bibliography of Literature on Sampling."

Serial 2337, "The Northwest Experiment Station of the Federal Bureau of Mines."

Serial 2339, "Drilling and Dustiness of Metal-Mine Air."

Serial 2318, "The Unsaturated Hydrocarbon Constituents of Gas from Destructive Distillation of a Water-Gas Tar and Coal Mixture."

Serial 2323, "The Smoke Problem."

Serial 2331, "Water Gas Tar Emulsions."

Association Activities

Indiana Retail Coal Merchants' Association

More than two hundred Hoosier retail coal merchants gathered at the sixth annual convention of the association in Indianapolis.

In the afternoon G. F. Olwin, manager of the Better Business Bureau of Indianapolis, urged upon those present the importance of building up good will for the coal industry through better business methods.

In his annual report, Secretary Yeagley pointed out that the membership had decreased during the year, due to the adverse conditions which have confronted coal men during the past eighteen months.

In his opening address, President E. E. Heller of Indianapolis, said that the worst is over, and that when the coal strike comes to an end, there will be an opportunity for business on a business basis.

J. H. Panabaker, of Kokomo, Ind., was elected president and other officers were named as follows: W. A. Dalton, Gary, first vice-president; Ray A. Macy, Indianapolis, second vice-president, and George E. Brunner, Kokomo, treasurer.

The new board of directors follows: E. M. Debos, Hammond, W. Boyd, Laporte; Charles Moellering, Ft. Wayne; C. W. Grant, Logansport; A. J. Krabbe, Lafayette; Conrad Heet, Richmond; C. F. Meyer, Jr., Indianapolis; M. O. Martin, Terre Haute; J. M. Winstandley, Bedford, and Morris Clark, Liberty.

Kentucky-Tennessee Coal Operators' Association

About twenty mine owners and others met at Pineville, Ky., late in April and formed the Kentucky-Tennessee Coal Operators' Association. After the aims and objects of the new association had been read which provide for a closer understanding with labor and co-operation with the mining bureaus of the two states, the following were elected as officers: President, W. B. Young, of Nashville, vice-president, M. T. Roach of Charleston, W. Va., treasturer, R. B. Moss, of Pineville, and D. Stewart Miller, of Knoxville, commissioner and secretary. It is understood that the headquarters of the association will be established in Knoxville.

Coming Meetings

National Retail Coal Merchants' Association. Fifth annual convention at the Drake Hotel, Chicago, Ill., May 18-20. Executive secretary, Joseph E. O'Toole, South Penn Square, Philadelphia, Pa.

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

Missouri Retail Coal Merchants Association will hold its annual meeting May 16 and 17 at the Planters Hotel, St. Louis, Mo. Secretary, F. A. Parker, Arcade Bldg., St. Louis, Mo.

National Coal Association will hold its annual meeting at Congress Hotel, Chicago, May 24 to 25. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham

The American Wholesale Coal Association will hold its annual convention at Detroit, June 1 and 2. Secretary, G. H. Merryweather, Union Fuel Bldg., Chicago, Ill.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 18-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at Trenton, N. J., June 7 and 8.

Retail Coal Dealers' Association of Texas. Seventeenth annual convention at Greenville, Tex., May 15 and 16. Banquets on both nights will be tendered the association, that on Wednesday night being given by the Greenville Chamber of Commerce and on Thursday by the Wholesale Coal Men. Secretary, C. R. Goldman, Dallas.

National Safety Council. Eleventh annual Safety Congress at Detroit, Mich., Aug. 28 to Sept. 1. Executive secretary, W. H. Cameron, North Michigan Ave, Chicago, Ill.

Coal Mining Institute of America will meet Dec. 13, 14 and 15 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 911 Chamber of Commerce Bldg., Pittsburgh, Pa.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

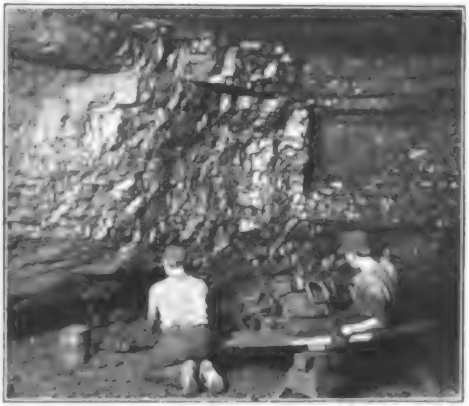
Volume 21 NEW YORK, THURSDAY, MAY 18, 1922 Number 20

Progress in Design of Mining Machines Has Greatly Reduced Labor Cost of Cutting Kerf in Coal

Review of Different Types of Machines—How Union Restrictions Hamper Progress—Records of Work Accomplished by Old and New Types and Information as to Current Used in Cutting

MINING machines are now cutting as many as sixty places in a shift and averaging thirty to thirty-five places. With coal 8 ft. thick and a place 15 ft. wide the tonnage obtained would be between 1,200 and 2,300 tons per day. The new machines eliminate much of the labor formerly necessary. Some do not have to be unloaded, merely personally conducted from job to job, and at that they carry their conductor with them. So easy is it to handle some of these machines that the work of cutting tends to become as light, if not as pleasant, as tending a steam engine or an electric generator on the surface.

As no stationary engineer would wish to make his piston make one stroke less than that for which it is designed, so no man running one of these labor-saving machines would care to diminish by a ton the quantity it would cut. For this reason a day-wage scale is well suited to cutting with machinery of this type, and if a tonnage scale must be made it should be much lower than that fixed for the early breast machines, which involved much labor and made comparatively little headway.



Courtesy, Sullivan Machinery Co.

FIG. 1. PUNCHER IN THICK COAL, ILLINOIS MINE

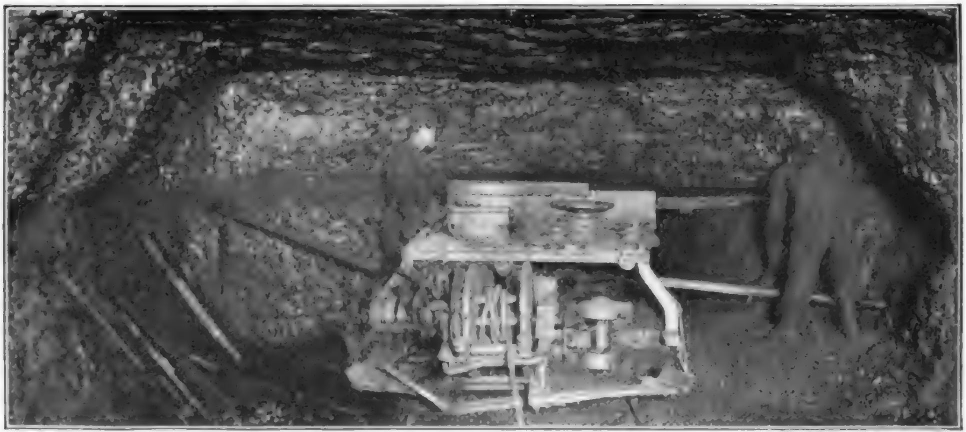
More correctly termed a pick machine, but usually known in coal-mine vernacular by the name given. This machine cuts an ideal kerf, which causes the coal to fall forward when shot down much as a tree falls when cut by an axe. The coal so cut breaks into large lumps but does not form a solid wall, and so is readily loaded. The slack is coarse and more readily vendible than "bug dust." But the puncher has lost much of its popularity. It involves too much work and skill and is slow in action. This is an old illustration, showing what was regarded at the beginning of the century as the last and best word in undercutting.

The relative outputs of modern and less modern machines are indicated by the new scale formulated by the Monongahela Coal Association, the operators comprising which own sixty-five mines on the Monongahela Ry. and the Morgantown & Wheeling R.R. This scale, posted Feb. 23, gives the following room-and-pillar mining rates: Breast machine, 9c. per ton; shortwall machine, 8c., and arcwall machine, 4.5c. When it is understood that the tonnage rate set is expected to reward the operative who handles the machine as well as the operator who provides it, it will be realized that a bigger advantage even than that reflected in the figures is obtained from the use of more up-to-date equipment.

Especially is this true because rapid cutting makes it possible to get a large tonnage from a small area, reducing haulage, ventilation, pumping and supervision costs. With some machines it makes it possible to operate by methods under which the roof could not be controlled were a slower method of mining adopted. The coal is pulled from under the roof so speedily that it is out before the measures have adjusted themselves so that they can fall. We are beginning to learn that under some conditions roof demolition is a progressive series of failures instead of a single collapse, and with speedy extraction the fall may not occur till the worker has worked his way well out of danger. Slowness in operation always results in loss of coal.

Just as the first attempts at the steam propulsion of ships simulated the oar and its movement, just as the first mowing machines imitated the hand scythe and its operation, so early efforts to produce a mining machine borrowed the action of the hand pick. Whereas the "steam rowboat" and the horse-operated scythe were failures, however, the pneumatic puncher after a term of development attained a marked degree of success.

Across the Atlantic our British friends developed the disk and bar undercutters. The first somewhat resembles a huge circular saw that may be drawn along the face, cutting a narrow gash beneath the coal in



Courtesy, Jeffrey Manufacturing Co.

FIG. 2. ARCWALL MINING MACHINE CUTTING BAND IN MIDDLE OF SEAM WITHOUT LEAVING TRACK

This machine has a long arm that makes a series of crescent shaped cuts in the semicircular coal face. The rooms are absolutely all of the same width, dependent on the radius of the swinging cutter bar. As many as thirty-five rooms have been cut in an eight-hour day.

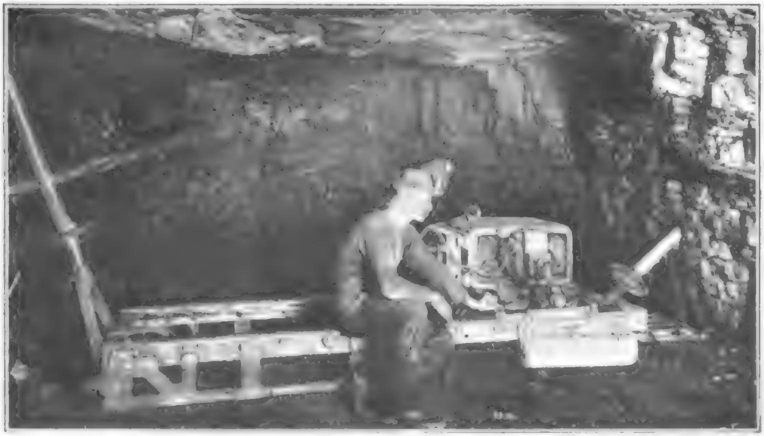
depth equal to almost half the diameter of the disk. The bar machine is essentially a helix carrying cutter bits on its circumference. After being forced endwise under the coal this bar, or helix, is fed along transversely, its action somewhat resembling that of the revolving or drill mortiser sometimes used in woodworking.

In this country two general types of machines have attained success—the puncher and the chain cutter. The first of these has already been mentioned, and its operation, advantages and shortcomings are well known to most mining men. Although a few machines of this kind were built for electrical operation, those now in use are, so far as is known, without exception driven by compressed air. They are virtually air-operated picks mounted on wheels. Their effectiveness in undercutting depends in no small degree upon the brute strength and skill of the men who operate them. It is not without deliberate intention that strength is mentioned first.

This machine, however, possesses three cardinal advantages. It is comparatively cheap in first cost, and the overhead charges on a mine equipped with punchers is in corresponding proportion. The exhaust from such machines aids ventilation and tends to cool the working places where they are used. The undercut made by the puncher is of triangular cross-section, the apex of the triangle being to the rear. This permits the coal to fall readily when shot down and tends to increase the percentage of lump size. The tumble thus given to the coal also shakes it piece from piece, making shoveling easier. Thousands of these machines are still in daily use.

Of the chain cutters three general types are now used: (1) The breast machine; (2) the continuous undercutter, either shortwall or longwall, and (3) the center cutter (including the top cutter) which may make either a circular or a straight-face cut.

In addition to the above-named types three others have been used to some extent. These include the Hess dustless machine, which is almost identical with the English bar machine previously mentioned; the Jeffrey

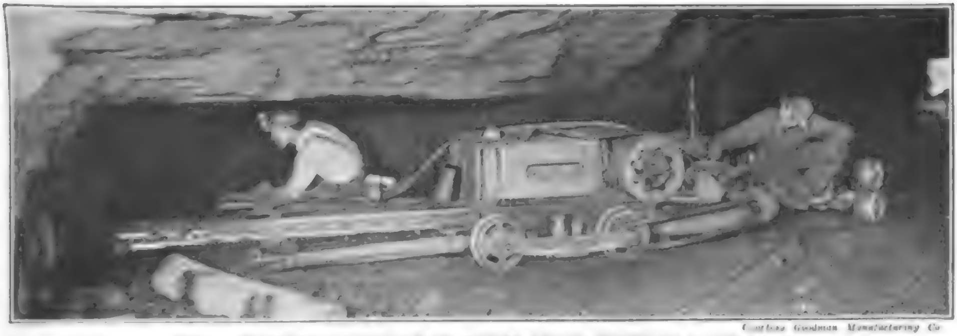


Courtesy, Jeffrey Manufacturing Co.

FIG. 3.

Breast Cutter

This cutter has to be sumped into the coal and withdrawn again two, three, four or more times in making a single cut across a face. Between cuts it must be moved over with bars. It cuts only at or near the bottom. Note the bad band at about the level of the man's head. Certain machines, not breast cutters, are constructed to cut such a parting so as to leave the coal clean, and in such a mine there would be no bug dust.



Courtesy Goodman Manufacturing Co

FIG. 4. SHORTWALL MACHINE ON POWER TRUCK ENTERING A LOW ROOM

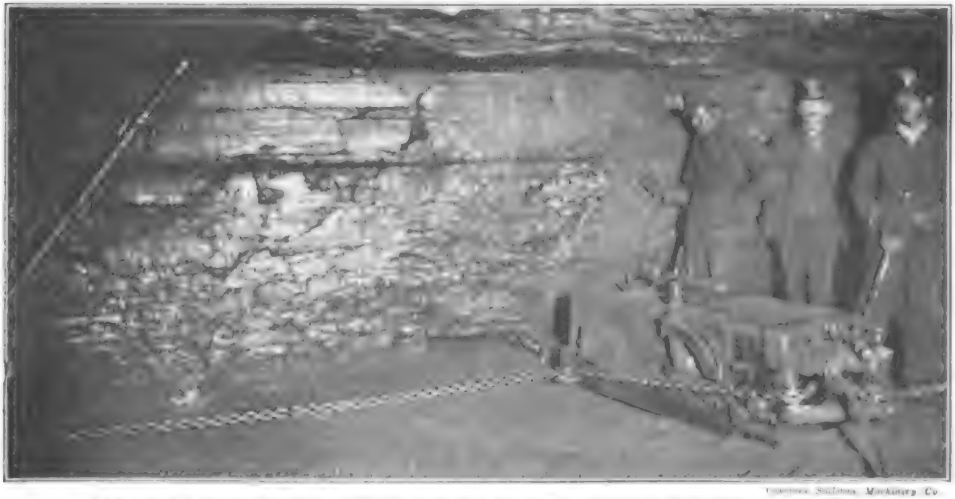
These machines can safely make turns that are but little easier than those laid in mines where mining is done by hand. A reel for the power cable is shown near the rear man. Note the daylight showing at the drift mouth to the right of the illustration. The rock roof is unusually strong for a room so near the surface.

heading machine and the Oldroyd machine. The heading machine is composed of practically three breast machines (one lying flat along the floor and two on edge, one at either side of the bottom cutter), a heavy picking device to knock down the coal and a set of conveyors to remove the mined material and deliver it to a pit car at the rear. This machine is first forced forward into the coal face along one rib, making one bottom and two side cuts. After it has penetrated the coal to the limit of its travel it is withdrawn and moved sidewise a distance almost equal to its own width (about 5 ft.). Here another cut is made. This operation is repeated until the full width of the room or heading has been covered.

The Oldroyd machine in appearance strongly resembles the shortwall undercutter, except that the cutter bar is carried at the end of a set of pantagraph arms which are pivoted to a vertical turntable on the front of the machine body. By this arrangement a cut may be made at any height within reach of the arms. Also a cut may be made in any direction. Thus, if desired, an undercut and any number of shear cuts may be made in the coal face. It is claimed for this machine that it makes a large percentage of lump, as it releases the coal both vertically and horizontally.

The breast machine consists of a horizontal framework that telescopes within a pan and around which a cutting chain revolves. Coal is cut only on the forward end of the frame. In operation a room face is undermined by forcing the frame bearing the chain successively under the face, the machine between runs being moved sidewise a distance equal to its own width.

This machine requires much prying about as well as the frequent setting and manipulation of jacks. It



Courtesy Sullivan Machinery Co

FIG. 5 SHORTWALL MACHINE CUTTING ACROSS THE FACE IN A WEST VIRGINIA COAL MINE

The shortwall cutter sumps itself into the coal face and then cuts from the side, being pulled forward by the steel chain shown, the movement being provided by the machine itself. Where the union does not limit the number of loaders working after a machine, as it too often does, a cutter like this can do much more work than the older type of breast machine. It should be given a lower wage scale than the old-style electric sumping machine.

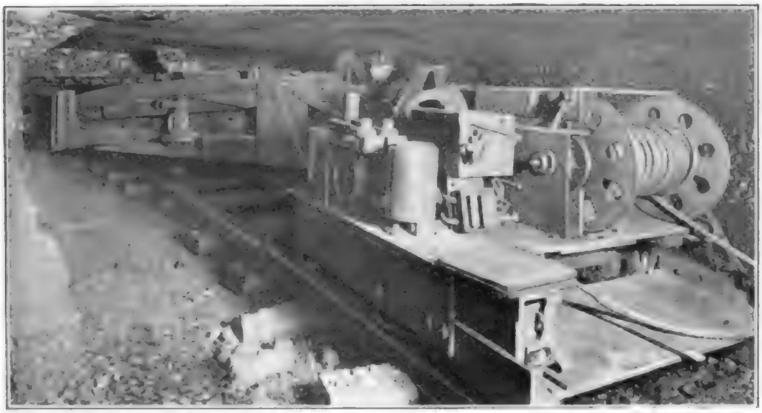


FIG. 6.

Parting Cutter

This machine cuts at the top or, within limits, at any level lower down. As will be noted, it stays on the rails when cutting and saves the work of loading and unloading at each cut. It is shown in this illustration starting a kerf in a parting a foot or more from the roof.

Courtesy Morgan-Gardner Electric Co.

has been extensively adopted, however, and many thousands are in everyday operation and an appreciable percentage of the bituminous output of the United States is produced by its aid.

In this country much favor has been shown to the shortwall undercutter. In this device the cutter bar, which ranges from 5 to 10 ft. in length, extends forward from the end of the box or case containing the driving motor and mechanism. In operation a sumping cut is made at one side of the room, and after the cutter bar has fully buried itself beneath the coal the whole machine is pulled sidewise across the face to the opposite rib. All movements are made under power.

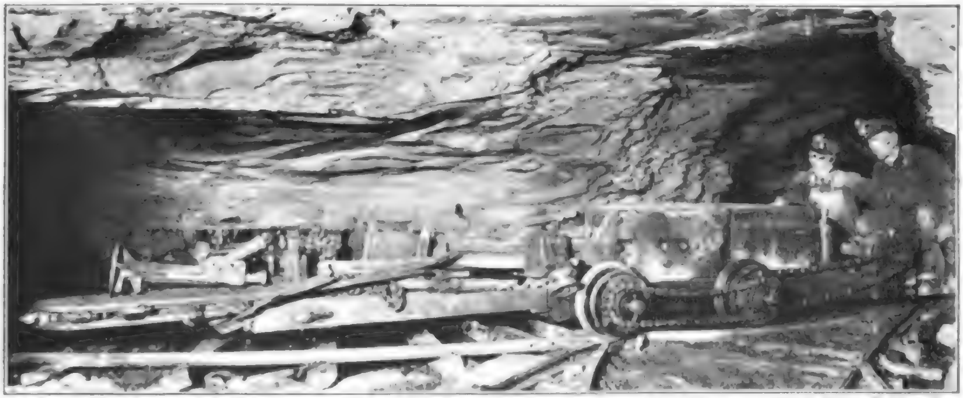
MACHINE EASILY LOADED BY SWIVELING SKIDWAY

One refinement or comparatively recent addition to the mechanism of this machine is a tilting and swiveling skidway upon the truck that conveys the undercutter from place to place. This permits the machine to be slid off the truck while pointed toward the place where it will sump in. In replacing the machine on the truck it moves up the inclined skidway under its own power in one continuous movement from the face.

The longwall machine is similar to the shortwall except that the cutter bar is hinged to the driving mechanism. By this means the major axes of the machine body and cutter bar may be placed at right angles to each other. In this position the width of the machine from the face amounts to only about 2½ ft., and timbers set with this much clearance need not be disturbed. The resistance to movement also is possibly somewhat less than with the shortwall machine.

Center and top cutters are perhaps the bulkiest and most expensive of the machines intended to merely mine the coal without displacing it or putting it onto a pit car. They are, however, as will be shown later, far more rapid in action than any of the types previously described. Of these the arcwall probably is the best known and most widely used.

This consists of a mechanism strongly resembling a shortwall machine mounted permanently on a truck in such manner that it may be swiveled or revolved by power. It also may be raised and lowered upon its supporting standards under power throughout a considerable range. The maximum width of room that can be driven from a single track with a machine of



Courtesy Sullivan Machinery Co.

FIG. 7. CUTTING MACHINE ENTERING A WORKING PLACE ON ITS POWER TRUCK

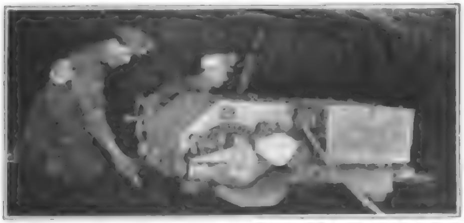
Despite their length and weight these ungainly machines have been so constructed as to enter rooms with comparative ease despite sharp turns and adverse grades. The reel is carried on the trailer in the rear. When this machine is cutting it is only 18 in. high and so can work in extremely low coal without difficulty.

this kind is twice the distance from the center of the turntable to the end of the cutter bar.

The straight-face machine is similar in most respects to the arcwall except that by means of a Y-shaped cam on the turntable the cutter bar is retracted in the center of its sweep across the face so that its end is caused to move in a straight line. The end or face of the place being driven is thus made straight and at right angles to the ribs. It is claimed that with this method of cutting the coal is brought down with less explosive than when the face is curved.

Supplying adequate power wherewith to drive cutting machines is an ever-present and sometimes vexatious problem at the mines. The working faces are almost invariably remote from the source of energy supply, with the result that low voltage is perhaps the rule rather than the exception. This is exactly what might be expected, as the mining machine usually draws its current from the trolley wire, often at points where it is not paralleled by a feeder, and through possibly some hundreds of feet of flexible double-conductor cable.

Recognizing this fact the manufacturers of this type of equipment have built their machines accordingly, with the result that the coal cutters of today are of sufficiently rugged construction to withstand safely the rough usage to which they inevitably will be subjected. It is not the intention to suggest by this that these devices are indestructible, as this is by no means the case. As now built, however, they will endure almost indefinitely, ordinary wear and tear expected, the use for which they are intended. Wear of mechanical parts, of course, cannot be avoided, this naturally being most rapid on the picks that do the actual cutting.

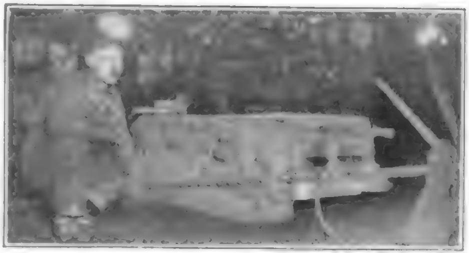


Courtesy Jeffrey Manufacturing Co.

FIG. 8. SHORTWALL CUTTER ENDING CUT

The shortwall cutter keeps closer to the face than the breast machine and so makes it unnecessary to keep a large area unpropped. In this instance a steel rope is used to pull the machine forward against the coal being cut.

Power readings and contrasts of operating time consumed by machines of this kind are likely to be extremely misleading. As one manufacturer puts it, "there are so many variables in this problem that published data would give an erroneous impression almost inevitably and might lead to misconception by the reader. The tendency always is to reason from the particular to the general on data of this sort. The length of cutter bar, the height of the coal, the character of the coal itself, including the presence or absence of impurities, the character of the bottom, the character of the current available (whether alternating or direct) and the voltage, the way in which the cutter bits are kept up or not kept up, the feeding speed used, the general condition of the machine and even the personal equations of the operator and his helper are all items that vary from place to place and from time to time even in the same mine or in the same part of the same mine."



Courtesy Sullivan Machinery Co.

FIG. 9. CONTINUOUS CUTTER IN A KENTUCKY MINE

This machine uses a chain to pull it forward to its work. The links of this chain rest in suitable pockets cast in the periphery of the pulleys by which it is actuated.

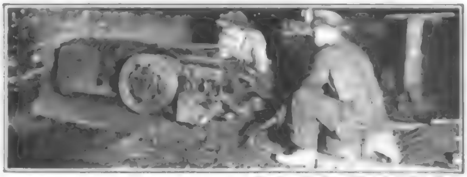
Now, suppose that the power and the time consumed in an operation of this kind, these amounts depending entirely on the various conditions encountered, are noted under particularly favorable circumstances. In such a case, from the standpoint of both power and time, the record would be good. In considering other mines, however, where the conditions were less favorable such results would be valueless. Even figures on average time of cutting and power consumption might be highly misleading.

As a result of these considerations and their obvious consequences too much dependence should not be placed in the figures here presented. These records, however, have been drawn from several sources and are believed to be typical of the results obtained in the mines specified.

Thus the Consolidation Coal Co. reports from Jenkins, Ky., as follows concerning its operation of the arcwall machine: "We have cut as many as sixty places with one machine in one shift, but as a rule we average cutting from thirty to thirty-five. The machine used has an 8-ft. cutter bar and makes a cut of this depth in a parting from 33 to 35 in. from the bottom. The power consumed varies with the character of this parting. In most places it is soft and no more power is required than is consumed by an ordinary shortwall machine when cutting in coal.

"The rooms are necked by the arcwall machine in the ordinary manner. They are driven from 12 to 15 ft. wide and the coal after being cut in the center of the bed is shot in two benches. Usually three holes are placed in the bottom bench and two in the upper one. If the coal is undercut three holes are required. When cut in the center, one center and two rib shots are necessary in the lower bench and two rib shots suffice for the upper one."

One objection sometimes raised to the employment



Courtesy Goodman Manufacturing Co.

FIG. 10. ALTERNATING-CURRENT COAL CUTTER

Cutting the coal face at the Tarnay Collieries Co.'s mine at Matewan, W. Va.

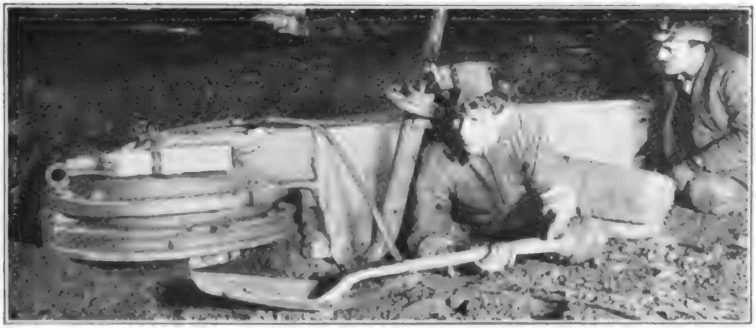


FIG. 11.

Longwall Cutter

This machine hugs the coal so closely that posts can be set only a few feet from the face. It will work in the lowest of coal, crawl up difficult grades, and few places are so tight that it cannot worm its way through. When at work the cutter bar and machine body stand at right angles to each other.

of the arcwall machine (but which probably is not peculiar to this type of coal cutter) is the difficulty experienced in making it cut out a parting if it be both hard and narrow. Just as an ordinary handsaw cutting soft wood with the grain will tend to deviate from a straight course when it encounters a hard layer nearly parallel with its cut, so the cutter bar tends to push out of a band of hard bone and operate in the softer coal.

BREAST AND SHORTWALL RESULTS IN ILLINOIS

Results obtained by the Peabody Coal Co. on breast and shortwall machines in certain of its mines in southern Illinois are shown in Table I. The breast machine operating at mine No. 11, at Kortkamp, was cutting in the No. 6 bed of Illinois, which is reported to be of medium hardness. It does not contain nearly as much sulphur, or blackjack, as is found in the Kincaid mine.

Both of the other machines operated in mine No. 7, at Kincaid, where also the No. 6 bed in the Illinois series is being worked. The cutting is said to be about as hard as is found in any mine operated by this company, sulphur balls and blackjack being frequently encountered. In addition to the data given in the table it is reported that the power consumed in moving the shortwall machine from room to room amounted to from 0.4 to 0.7 kw.-hr. per place. That consumed in sumping amounted to from 0.85 to 0.9 kw.-hr. in each case.

TABLE I. RECORD OF THREE TESTS OF MACHINES IN MINES OF THE PEABODY COAL CO.

	Type 119 Breast Machine, 3 ft. 11 in. x 6 ft. 0 in. Cutter, 4½ in. Kerf, at Mine No. 11 Kortkamp, Ill.	Type HHD Breast Machine, 3 ft. 4 in. x 6 ft. 0 in. Cutter, 3¾ in. Kerf,* at Mine No. 7 Kincaid, Ill.	Type CE 7 Shortwall Machine, 6 ft. 6 in. Cutterbar, 5½ in. Kerf,† at Mine No. 7 Kincaid, Ill.
Number of runs made	12	11	6‡
Av. time of cutting in each run	4 min.	4 min.	49.1 min.§
Av. time backing out of each run	¾ min.	1 min	
Av. depth of cut	5 ft. 6 in.	5 ft. 6 in.	5 ft. 10½ in.
Av. width of cut	3 ft. 2 in.	3 ft. 2 in.	34 ft. 1½ in.
Av. area undercut	17.4 sq.ft.	17.6 sq.ft.	199.1 sq.ft.
Av. voltage	250	219	266
Av. kw.-hr. consumed per cut	0.92	1.18	9.66
Av. watt-hr. per sq.ft. of cut	49.	66.	48.5
Av. height of coal	7 ft.	7 ft. 6 in.	7 ft. 6 in.
Kw.-hr. consumed per ton	0.19	0.24	0.175
Av. kw.-hr. consumed cutting in	0.85	1.07	....
Av. kw.-hr. consumed backing out	0.06	0.11	....
Time unloading per room	....	4.5 min.	....
Time loading per room	....	4 min.	....
Av. time of moving	....	....	25 min.
Time of unloading and setting up	....	....	75 min.
Time of loading	....	....	9.2 min.
Av. No. of bits used	....	....	55.5
Av. tons cut	....	....	55.4
Av. No. of bits used per ton	....	....	1

* Five-position chain with pick-point bits used.
† Seven-position chain with pick-point bits.
‡ In this case each run means a room cut.
§ This includes sumping 9.5 min. and cutting across face 39.6 min.

In Table II are assembled results obtained by the Consolidation Coal Co. with breast machines fitted with coal-boring augers for putting in shotholes. These figures show wide variations in power consumption. Especially do they show that as the amperage consumed by the machine goes up the voltage goes down, or vice versa. When the potential of a 250-volt circuit sinks to 70 to 80 volts, as is shown in certain instances in this table, excessive current is drawn from the line.

Fig. 12 shows rough graphs of the power consumed by these breast machines while cutting. The ordinates of these curves are horsepower consumed—that is, the product of observed voltage and amperage divided by 746, while the abscissæ are merely successive observations from start to finish of the run. From the tabulated observations all figures recording consumption while boring shotholes, running light, and backing out have been eliminated, so that the curves show the power required for cutting only. In both cases the bits were sharp at the start.

Numerous observations on the shortwall undercutter

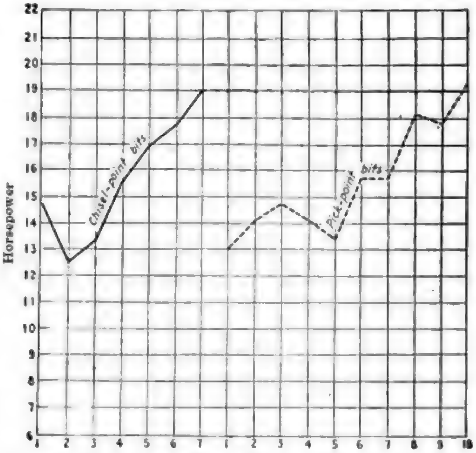
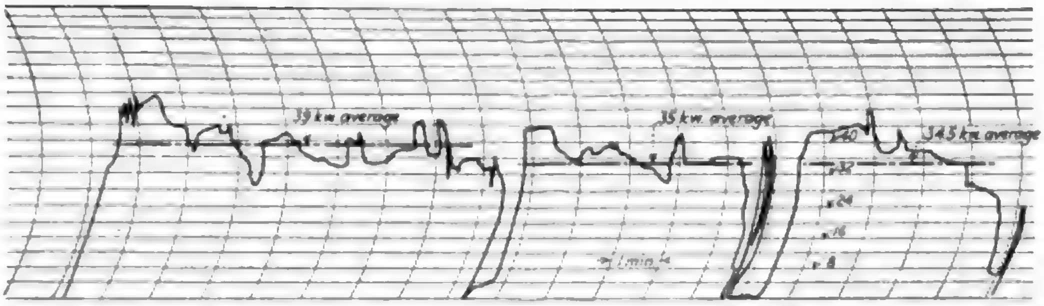


FIG. 12. RESULTS AT CONSOLIDATION COAL CO. MINES

Abscissae show successive observations, time not stated. Ordinates show horsepower consumed. Results are given for chisel- and pick-point bits.

FIG. 13.
Breast Machine Cut

Cutting coal in three sumps. The curved ordinates represent kilowatts of power used at any given time during the cut.



Courtesy Jeffrey Manufacturing Co.

made in various mines show about the following results: A machine provided with turntable truck and tilting platform ordinarily is unloaded in about one minute. It takes from one to two minutes to set jacks and get ready to make the sumping cut. It requires about one and one-half minutes to sump, after which the machine is fed across the face at the rate of from 20 to 24 in. per minute if the cutting is easy and about 17 in. per minute if the coal is hard, or somewhat less if the voltage is low. After the undercut is complete the machine is drawn back to the truck at the rate of 20 ft. per minute. Loading takes from one to two minutes and moving along the track from place to place is done at the rate of about 300 ft. per minute.

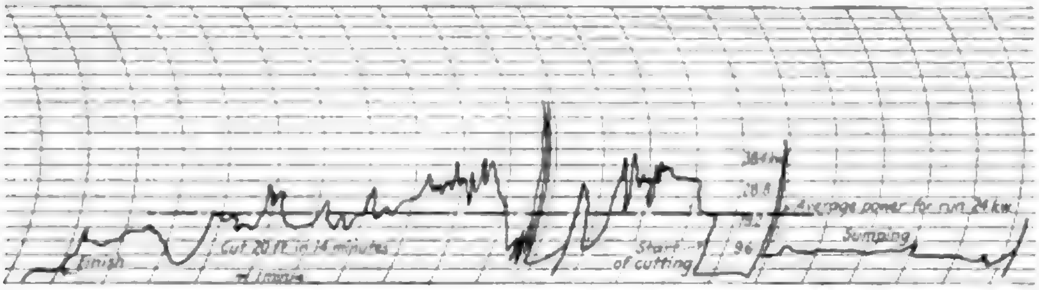
Observations on the power consumed by coal-cutting machines show that on the average about 40 watt-hours are required per square foot of floor area covered. In easy cutting this may fall to as low as 30 watt-hours and in hard material it may go as high as 55 watt-hours or more. In rock or other impurities the power consumption may run considerably higher. Both shortwall and arcwall cutters when at work will require on the average about 120 amperes at 250 volts.

Fig. 14 shows the power consumed by a shortwall machine equipped with an alternating-current motor while operating in the Island Creek coal bed at Omar, W. Va. The cutting encountered at this mine is classed as "average hard" and the input averaged 24 kw. Fig. 15 is a record of the input to a shortwall machine equipped with a direct-current motor when operating in easy cutting. Here the input averaged 20.6 kw.

Fig. 13 is the input to a machine operating in the same mine as the one shown in Fig. 15. In this instance, however, the cutting was extremely hard, as the machine worked into the bottom and was operating in rock. This condition is not infrequently encountered.

In Fig. 16, curve *A* shows the average voltage condition prevailing in a typical 250-volt mine. It should be noted that the potential while cutting averaged only 175 volts at the machine. Curve *B* shows the input to the undercutter in amperes. The cutting done at this mine was recorded as "easy," and the machine was in good condition. Curve *C* shows the power consumption in kilowatts. All three of these curves were taken simultaneously on the same machine. It will be observed that about 10 per cent discrepancy exists between the average kilowatt consumption and the volt-ampere records. This was caused by the zero errors in the recording meters and the slight inaccuracies existing in portable instruments of this type.

Of the chain undercutters the breast machine was the pioneer. The advent of the shortwall, or, more strictly speaking, the continuous cutting machine, brought a powerful rival into the field. For a long time the breast machine was considered the more advantageous type to use in narrow places, but this advantage, if ever really possessed in actual practice, has now been largely neutralized by the introduction of the tilting and swiveling truck. When it is possible with the shortwall



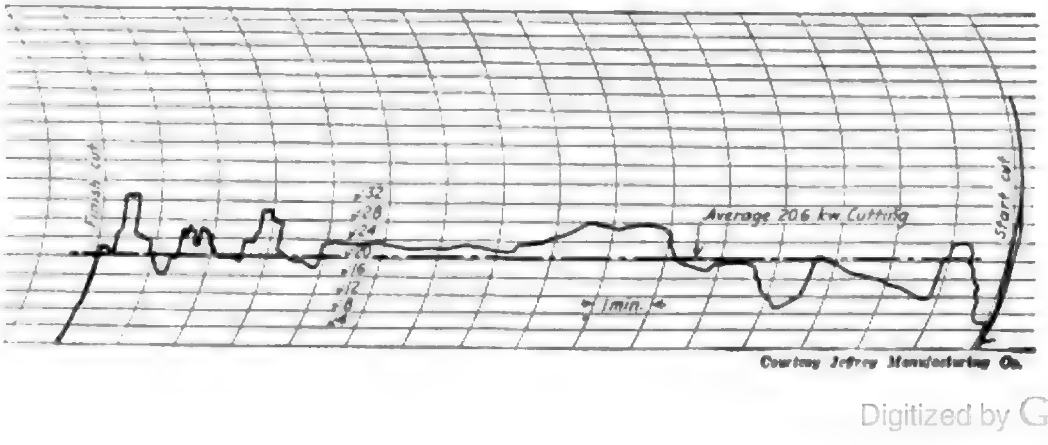
Courtesy Jeffrey Manufacturing Co.

FIG. 14.
Shortwall Cut

Sumping cut takes only about 10 kw., and the average power consumption for the straightaway cutting is 24 kw.

FIG. 15.
Another Shortwall Cut

Here the average wattage used is 20.6. The momentary peak is 56 kw. The place is cut in sixteen minutes.



Courtesy Jeffrey Manufacturing Co.

TABLE II. OBSERVATION OF VOLTAGE, AMPERAGE AND CUTTING TIME USING BREAST MACHINES AND AUGERS

Running Light		— Full Load —		Backing Out		—— Auger ——		Time of Run, Min.
Volts	Amps.	Volts	Amps.	Volts	Amps.	Volts	Amps.	
		200-210	40-50	225	20-25	225	25	
		200-215	40-55					
		200-210	40-55	225	20-25	225	25	4
210	25			200-210	20-25	190	40	
205	20	175-200	40-60	205	30	205	35	4½
		155-190	50-75	200	25			
		200-235	32-50					
240	10	160-230	30-50	240-250	10-15	170-240	10-20	
		130-220	30-65	220	15	210-230	15-25	
		210-220	25-35	180	25	220-230	20-25	
		80-175	40-60	210	24	190	27	8
		70-175	50-75	160	25	180-200	20-30	
		210-220	40-50			225	28	4
215	25	150-190	42-80	210	32	170-200	35	
		60-190	55-125	215	25			
		100-200	30-85	155	45	200	30	4½
		160-225	50-105	220	50	225-230	30-40	4½
		150-240	25-100	225-230	30	220-230	30-35	4½
		200-250	20-75	230	25			4½
230	20	175-210	50-70			225	35	4½
		185-200	70-80	210	58	210	45	4½
		190-225	35-70	245	20			4
270	20	260	50					
265	25	225	70					
230	20	195-220	45-60	220	25			
		165-225	50-90	250	25	240	30	4
		140-180	45-70	200	30	175	50	7
		135-180	49-72	185	40	125-165	30-40	
233	20.6							

machine to unload, cut a place, reload and move out into the entry again, all within the space of 17 minutes, as has been done repeatedly, little if any advantage remains to the breast machine.

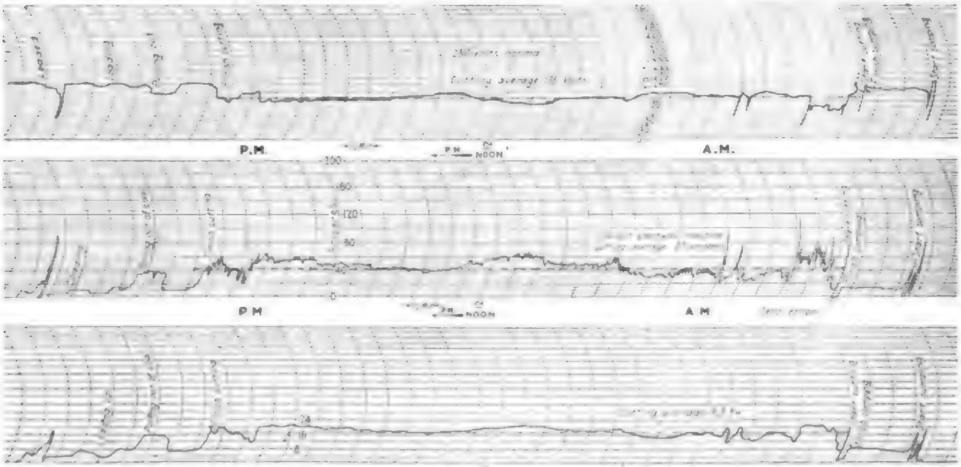
On the other hand, adoption of the continuous cutter, whether of the shortwall or arcwall type, has been impeded by reason of restrictions laid down by the miners' union. In many localities a fair differential for the mining machine cannot be obtained. When the union demands that only a certain number of loaders may be employed for each machine—seven, ten, fourteen or whatever this number may be—based on puncher or breast-machine operation, little incentive is offered for the installation of a modern undercutter, which, if properly scheduled, can mine as much coal as forty-five to fifty shovelers can load out.

Few figures are available on the amount of coal produced per pound of powder when undercut by hand pick as compared to that produced per pound when undercut by machine. One of the reports of the State Mining Board of Illinois, however, shows that this ratio is about 4 to 1 in favor of machine cutting. Pick mining is laborious work and consequently the hand miner is always tempted to drill his shotholes deep so as to bring down some coal from the solid. This may account in some measure for the comparatively poor showing of hand mining in the consumption of explosives.

In conclusion it might be said that all experience has shown that it pays to displace human energy with mechanical energy—to substitute a machine for a man wherever this can be accomplished successfully. The production of coal is no exception to this rule and little question exists today concerning the utility of the mining machine of modern type. Unfortunately, however, trade unions, particularly those composed of unskilled or only semi-skilled workers, through a perverted conception of economics and a distorted idea of what is to their own as well as the general advantage, are not infrequently inclined to "buck" the adoption or restrict the use of such labor-saving devices.

The Preliminary Draft of a proposed schedule to cover tests of mine telephones to determine their permissibility for use in gaseous mines has been prepared by the U. S. Bureau of Mines. The schedule is based on experiments at the Pittsburgh station, which proved that under certain atmospheric and mechanical conditions an electric spark of sufficient intensity to ignite gas could be produced.

The U. S. Bureau of Mines is collecting data relative to the use of brattice cloth in mines. At present little is known as to the amounts used, or the life of different cloths under different conditions of use, although the aggregate expenditure for this purpose is large. Samples of cloth used at a number of large coal mining plants in western Pennsylvania have been obtained by the bureau.



Courtesy Jeffrey Manufacturing Co.

FIG. 16 VOLTAGE, AMPERAGE AND WATTAGE USED IN A SHORTWALL CUT

The top chart shows the variation in voltage, the middle that in amperage and the lower one that in wattage. The power used varies but little after sumping and is small, of course, in pulling out of the coal and loading up on the truck, the latter taking about 8 kw. The cutting average is only 16.8 kw. in this instance. Note that the ordinates are at half-minute intervals.

Records at Kathleen Mine Show That When Running Time Is Halved Power Costs Per Ton Mined Are Doubled

How Steady Runs Lower Power Cost—Power Used for Various Services Is Tabulated Just as Labor Costs Are Distributed on Rolls—Sectional Meters Will Check Power Purchased

By Eugene McAuliffe*
St. Louis, Mo.

Most coal companies now make some attempt to ascertain and to record the cost of the power consumed in the various phases of mine operation. In many instances an accurate determination of the various items can be obtained only with difficulty because the power for locomotives and mining machines as well as for pumping is generated at the mine and the output of the power plant is distributed to two or more developments without any attempt to make the primary and secondary meterings that are necessary where the power consumption of any operation is to be determined. This situation is in many instances further complicated by the joint use of both steam and electric energy.

Most coal mines that use steam power generate it from the coal they produce. In consequence the coal actually burned is not properly measured and the fuel consumed is not charged at its true market price. In most cases both the weight of the fuel burned and its value are determined empirically. For this reason the cost of power cannot be gaged with accuracy.

A statement showing how the power was used in the different processes of mining during the coal year from April 1, 1921, to March 31, 1922, for the Kathleen Mine of the Union Colliery Co., at Dowell, Ill., is presented herewith. This offers an opportunity to analyze the cost of individual processes. It also presents some interesting records of the effect of low tonnage and short working time on unit power costs.

Steady Run Tends to Reduce Power Cost

Whenever a reasonably steady run can be obtained in the coal-mining field, the cost of power will be reduced by that fact in the same proportion as other items of expense. It will be noted in the distribution sheet that with 9.69 working days in July, 1921, the cost of power at this mine amounted to 13.36c. per ton of coal produced, whereas in March, 1922, when the mine worked 21 days, the power cost was only 6.43c. per ton.

Had it been possible to maintain the March cost throughout the entire year, the total power bill would have been reduced by $14,107.51. On the other hand, had the cost for power obtaining in July, 1921, or 13.36c., been carried through the production of the year, this amounting to 468,688 tons, the sum paid would have exceeded the expense entailed by the low-cost power of March by $32,480.08.

At this mine steam is used only for heating the various buildings and warming the water used in the washhouse. Below ground the equipment consists of fourteen 6-ton 250-volt direct-current trolley gathering locomotives, two 15-ton haulage locomotives operating on the same current and voltage, eighteen shortwall mining machines driven by 220-volt alternating current and four breast machines taking this same current and potential.

Above ground the equipment embraces one 600-hp. 500-volt motor drawing direct current from a 500-kw. 2,200-volt alternating-current motor-generator set equipped with liquid rheostat and a 10-ton flywheel. The direct-current motor is geared to a cylindro-conical drum, the hoist operating two 10-ton skips. The man-and-material hoist consists of a 250-hp. 2,200-volt alternating-current motor geared to a cylindrical drum operating a counterweighted cage. A 50-hp. 220-volt alternating-current motor is belted to the ventilating fan. When necessary, this will be replaced by a machine of larger capacity. The tipple machinery, the shops and the pumps are all operated by alternating current at 220 volts, the motors for driving the various machines or groups of machines ranging in size from 3 to 30 hp. All alternating current is 3-phase, 60-cycle.

The shortwall mining machines are fitted with cutter bars 7 ft. 6 in. long and those of the breast machines are 6 ft. in length. The average thickness of the Illinois No. 6, or Herrin, coal bed, which is worked at this mine, is 8 ft. 6 in. From 6 to 7½ ft. of coal ordinarily is removed in entries and rooms, the remainder being left up for roof protection. In undercutting, the machines keep from 2 to 4 in. above the relatively hard fireclay floor, leaving the bottom coal for the miners to lift. This they do without difficulty. By this procedure the coal as produced is free from fireclay and other bottom impurities. Taken as a whole, the conditions for undercutting are quite favorable.

Conditions encountered in the underground haulage at this operation are comparatively difficult. This is

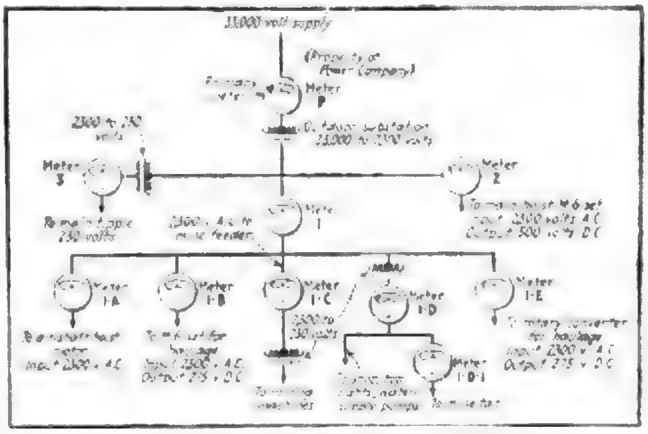


FIG. 1. CHART OF METERING ARRANGEMENTS, KATHLEEN MINE

These meters make it possible to ascertain where the power purchased goes, a necessary preliminary step that must be taken if power leaks are to be stopped. Knowledge concerning present costs is the only firm foundation on which to build plans to reduce costs in the future.

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*President, Union Collieries Co.

POWER USED AND DAYS WORKED IN ONE COAL YEAR, WITH DISTRIBUTION OF POWER INTO ITS VARIOUS USES, KATHLEEN MINE, DOWELL, ILL.

	Days Worked	Tons Produced	Mining Machines		Gathering and Haulage Locomotives		Main Hoist		Tipple Machinery		Mine Fan		Man-and-Material Hoist		Shop-Top Lights and Water Supply		Transmission and Transformation Losses		Total Power Purchased 100%	Kw.-hr. Per Ton	Cost Per Kw.-hr.	Cost of Power Per Ton
			Kw.-hr.	Per Cent	Kw.-hr.	Per Cent	Kw.-hr.	Per Cent	Kw.-hr.	Per Cent	Kw.-hr	Per Cent	Kw.-hr.	Per Cent	Kw.-hr.	Per Cent	Kw.-hr.	Per Cent				
1921																						
April	13.13	27,106	12,840	10.6	48,838	40.3	15,030	12.4	4,688	3.9	23,200	19.2	4,480	3.7	2,560	2.1	9,503	7.8	121,139	4.70	$.0256	$.1204
May	12.50	29,685	13,840	11.6	51,074	42.8	14,535	12.2	4,656	3.9	23,000	19.3	3,720	3.1	1,980	1.7	6,464	5.4	119,269	3.87	.0280	.1070
June	12.12	29,924	14,000	11.5	54,500	44.6	14,655	12.0	4,344	3.7	21,600	17.7	3,840	3.2	2,160	1.8	6,728	5.5	122,027	3.67	.0285	.1045
July	9.69	23,653	16,600	14.9	43,988	39.4	11,655	10.5	3,888	3.5	22,000	19.7	3,400	3.0	1,760	1.5	8,387	7.5	111,678	4.72	.0284	.1336
August	11.00	32,259	14,640	11.4	56,212	43.7	15,795	12.3	5,056	4.0	21,900	17.1	3,600	2.8	1,860	1.5	9,249	7.2	128,312	4.19	.0265	.102
September	12.19	36,859	16,800	13.0	58,418	45.3	17,205	13.4	5,632	4.3	21,110	16.4	4,240	3.3	2,260	1.7	3,294	2.6*	128,959	3.38	.0285	.0962
October	19.50	58,237	24,880	13.3	83,059	44.5	27,555	14.8	11,456	6.1	23,800	12.7	5,160	2.8	2,760	1.5	8,001	4.3	186,671	3.61	.0214	.0774
November	10.94	34,321	14,960	11.0	57,119	42.0	16,270	12.0	4,112	3.0	22,300	16.4	4,360	3.2	3,460	2.5	13,444	9.9	136,025	3.47	.0302	.1047
December	11.00	36,103	16,760	12.0	57,947	41.4	16,870	12.0	5,920	4.2	24,000	17.1	3,840	2.7	2,880	2.1	11,912	8.5	140,129	3.38	.0300	.1014
1922																						
January	12.56	43,330	18,000	12.0	61,570	41.2	19,400	13.0	7,200	4.8	24,500	16.4	3,800	2.5	3,100	2.1	12,022	8.0	149,592	3.83	.0251	.0964
February	14.00	46,919	20,960	13.5	68,090	43.8	22,120	14.2	7,376	4.7	19,400	12.5	4,320	2.8	5,000	3.2	8,264	5.3	155,530	3.15	.0267	.0842
March	21.00	70,292	28,120	13.3	99,706	47.1	32,360	15.3	11,696	5.5	21,000	9.9	5,880	2.8	6,440	3.0	6,486	3.1	211,690	2.83	.0227	.0643
Totals and averages	159.63	468,688	212,400	12.4	740,523	43.3	223,450	13.1	76,224	4.4	267,810	15.7	50,640	2.9	36,220	2.1	103,754	6.1	1,711,021	3.65	$.0259	$.0944
Average kw.-hr. per ton			.45		1.58		.48		.16		.57		.11		.08		.22		3.65			
Av. cost of power, per ton			$0.0116		.0409		.0124		.0041		.0148		.0028		.0021		.0057		.0944			

* Primary meter broken down part of month. Consumption during period of disablement estimated.

particularly true with respect to the control of loaded trucks moving toward the shaft bottom on a descending grade of 7 per cent. As the mine is new, the extreme length of haul is approximately 3,600 ft., and the average is about 2,600 ft. The grades, which favor the loads, are such as to restrict a full trip to a maximum of fifteen cars, although additional wagons may be handled by the aid of skid shoes. The cars used at this mine are of 42-in. track gage and weigh 4,200 lb. each. They are of wooden construction, fitted with roller-bearing trucks and wheels 16 in. in diameter. The gathering locomotives place these cars at and remove them from the working faces, automatic reels and cables being used for entering the rooms.

In considering the energy consumed and the cost per ton resultant upon the use of gathering and haulage locomotives, this power amounting to 43.3 per cent of the total, due allowance must be made for the fact that secondary transmission losses occur as a result of converting 2,300-volt alternating current into 275-volt direct current. Line losses on the mine bottom, both primary and return, also are material, because of the usual difficulty encountered in maintaining the low-voltage trolley line and the return in good condition. As the result of providing adequate primary and return feed lines, however, the direct-current potential at the points most remote from the generators seldom falls below 200 volts.

POWER DELIVERED AT POTENTIAL OF 33,000 VOLTS

Power is purchased and delivered to the mine at a potential of 33,000 volts. The metering diagram, Fig. 1, indicates the pressures at which the power is consumed and measured. A study of this arrangement shows that transmission and transformation losses occurring between the power company primary meter (*P*) and the submeters installed by the coal company are all measured except those resulting from conversion by means of the motor-generator and rotary-converter sets and the transmission to underground substations and transformation at these points of the energy used by the mining machines.

All submeters owned by the company are located in an indoor substation, from which 230-volt alternating current is transmitted to the main tipple machinery, to the shop and the lighting load, as well as to the mine fan, all of which are located within 300 ft. of the meters. Furthermore 2,200-volt alternating current is transmitted to the main hoist, to the mining-machine meter, the motor-generator set and rotary converter for direct-current haulage supply and to the man-and-material hoist motor. The main portion of this load lies within the airshaft hoist house.

The tabulation of results derived from this metering arrangement furnishes some interesting facts: (1) It shows clearly the relation of work, time and tonnage to power cost, this latter ranging from 6.43c. to 13.36c. per ton of coal produced. When the mine has attained its full growth this effect will be further enhanced, because the power schedule, as is common practice, contains a demand or service charge as well as an energy charge per kilowatt-hour consumed. The demand charge is not reduced during months of low production, and in consequence contributes substantially to the high power cost per ton. As the capacity of the mine and the connected load increase, the demand charge also will increase. (2) Haulage is the greatest power-consuming process that the coal passes through. The tabulation indicates that more power is consumed in transporting the coal than is required for the sum of its cutting, hoisting and preparation. (3) The ventilating load is remarkably constant, varying practically in accord with the number of days in the month. (4) Employing a metering arrangement of this nature permits a close check of the correctness of the power company's bill. Meters owned by this company are read daily, and in case of breakdown of an individual meter, this record is of value in the determination of correctness.

The power consumed at the Kathleen Mine is purchased from a public utility serving a large number of operations. In order to make possible a comparison for determining the desirability of electric installation, the existing authorized public tariff is set forth as follows: Demand charge for first 200 kw. of maximum demand, $2.40 per kilowatt per month. For all demands in excess of the above $1.95 per kilowatt per month. The energy charge is as follows: First 1,000 kw-hr., per month, 6c.; next 2,000 kw-hr., 4c.; next 2,000 kw-hr., 3c.; next 20,000 kw-hr., 1.7c. All energy in excess of the amounts above enumerated is at the rate of 1.3c. per kilowatt-hour per month.

The service so far rendered has entailed many interruptions necessitating frequent applications of the steam auxiliary fan drive. Serious operating and maintenance losses also have been sustained.

Steam, Air and Water Lines Can Be Closed From a Distance by Electric Current

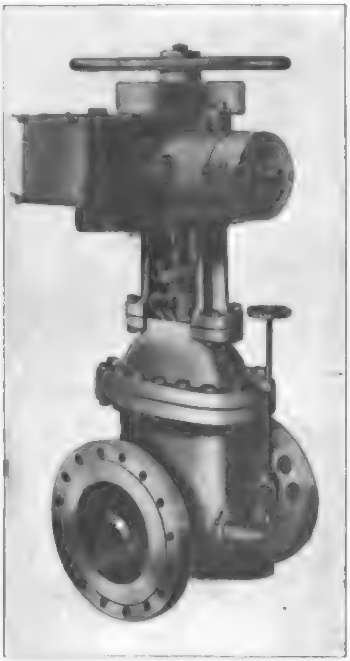
NEED for a type of valve capable of remote electrical control long has been recognized. This need obviously is particularly urgent in time of accident, as upon such an occasion manual methods of valve closure are not only slow and extremely hazardous but are sometimes utterly impossible. It is unnecessary therefore to dwell upon the advantages inherent in the expeditious control of valves in steam, air or water lines carrying heavy pressures when such control may be effected from a safe distance.

Up until the time when certain tests were made upon electrically controlled gate valves by the Public Service Electric Co., at Newark, N. J., a reasonable degree of doubt existed in the minds of engineers generally as to the reliability of such a mechanism under the extreme conditions occasioned by the rupture of a steam pipe. The tests in question demonstrated, however, that a valve if properly designed and constructed would function reliably even under these severe conditions.

Upon the occasion referred to the test was made on a Lunkenheimer 10-in. cast-steel monel-mounted Victor gate valve equipped with Dean electric control. This device successfully closed in less than 30 seconds against steam at 225-lb. pressure and carrying 150 deg. F. of superheat. The discharge end of the valve was open to the atmosphere and the steam was allowed to flow for one and one-half minutes before closure of the gate was attempted.

After the test the seat and disk rings were carefully examined to ascertain the extent of the damage, if any, that had been done. The various parts, however, were found to be in perfect condition and showed no marks such as would have been caused by the disks dragging across the seats as a result of improper guidance.

Valves of this kind are now procurable in either iron or steel body in sizes of 6 in. and larger. They may be made to operate from as many different control stations or points as desired. The valve shown in the accompanying illustration is intended for a working steam pressure of 350 lb. and a temperature not exceeding 800 deg. F. Valves of this type, either with or without bypass, are recommended for installation in boiler leads, for sectionalizing the main header or upon individual lines to the various prime movers in a steam plant.



VALVE EQUIPPED FOR REMOTE CONTROL

Many mines have valves that should be capable of being put in operation from a distance. Some are too distant or too near escaping water or steam to be quickly or safely closed. This valve is equipped with a device that makes closure under those conditions safe, quick, easy and certain.

A detailed report of government savings during the year which will end June 30, 1922, was transmitted to Congress May 8 by the President, showing fuel savings, among others. In the Public Health Service a saving of $13,500 in fuel is noted. In fuel storage at the Mare Island (Cal.) Navy Yard, a saving of $393,427 is reported, and $15,000 at the Melville (R. I.) coal depot. In the Bureau of Mines $1,629 was saved from the appropriation made for testing fuel. The navy closed the South Boston fuel depot, saving $50,000; the South Charleston fuel depot, saving $32,000; partially closed the Newport News fuel depot, saving $2,000, and partially closed the Constable Hook (N. J.) fuel depot, saving $105,000. Authority has been requested to close the navy fuel depot at Newport News, Va., and to dispose of the coal at that station. A cheaper grade of coal for use at navy power plants at shore stations is being purchased and substantial economies effected thereby.

PROGRESS IS BEING MADE by the U. S. Bureau of Mines in obtaining more definite information regarding the subject of mine subsidence, in connection with coal mines as well as in Michigan iron mines and in certain Western copper mines.

Power Drills Much Reduce Costs of Drilling Harder Coals and Lower the Hazard Costs of Mining

By Newell G. Alford*
Pittsburgh, Pa.

Where Car Supply Is Adequate and Men Can Load Steadily Power Drills Increase Output—Portable Air Compressors and Motor-Generator Sets—Records of Performance

WHEREVER the coal to be shot down in mining is of a medium to a hard texture or where sulphur balls frequently occur, the availability of the power drill as a means of reducing the cost of drilling is most keenly appreciated. The power drill also particularly commends itself wherever the supply of mine cars is so ample that the miner could continue loading all the day long if he did not have to stop to drill. In such cases the advocates of the use of power for drilling urge that there is a saving of the time lost in hand drilling and an increase in the quantity of coal which a loader can put on the cars. Furthermore it is urged that by more uniform and more intelligent methods the hazards of mining are much reduced.

In central Pennsylvania portable air drills are supplied from portable air compressors that deliver the air at a pressure ranging from 80 to 90 lb. per square inch. These are driven with 12½-hp motors. At one mine which is equipped with 440-volt alternating current an electric drill is used. At plants equipped with electric current it has been found, after much experimentation, that air drills are not as economical as those driven by electricity, but difficulty will be found in obtaining an electric drill that will operate satisfactorily on 550-volt current.

Where coal is unusually hard it is good practice to use a portable motor-generator set or a motor-driven compressor. While these means of obtaining the requisite power are more costly than more direct methods, owing to the loss in the transformation of energy, they are more justifiable with hard coal because by their use the energy imparted is greater and the drilling speed is increased.

At one plant an electric drill was used having an auger advance of 37.4 in. per minute and a threadbar with a No. 10 thread. When this machine operated at 224 r.p.m. on 250-volt direct current, boring a hole 2 in. in diameter, holes 6 ft. deep were drilled in an average time of 3.6 minutes, exclusive of the time consumed in loading, unloading and transferring. In this case augers 3 ft. 6 in. long were used in drilling the first half of the hole and an extension bit 6 ft. 6 in. long was then put in the machine to complete the hole. As an average three minutes was consumed in making power connections, unloading the drill from the truck and setting up the machine for the first hole. After drilling the three to five holes which sufficed for the shooting of the working face, an average of 2.7 minutes was taken to disconnect the power and load the equipment before transferring to the next place. The power consumption was 0.038 kw.-hr. per ton drilled. The table accompanying this article shows the results obtained in several mines with drills of various kinds.

In the full-page illustration, Fig. 1, a man is shown using a Cincinnati Electric Tool Co.'s breast drill and sinking a shothole in the rib of a heading, probably preparatory to turning a room. Saddling the real work of drilling onto the generator in the far-away power

EXPERIENCE WITH SEVERAL TYPES OF ELECTRIC AND AIR DRILLS IN THE DRILLING OF COAL

Mining District	Seam Worked	Coal Thickness, Inches	Width of Face, Feet	Holes Per Man Per Shift	Holes Per Place	Tons Coal Per Hole	Kind of Explosive	Tons Coal Per Lb. Explosive	Kind of Power
Central Penna.	Cement	47	26		4	7.75	Hercules Permissible	8.1	Air from portable compressor
Central Penna.	Miller	48	26		4.5*	7.00	Hercules Permissible	7.3	Air from portable compressor
Connellsville	Pittsburgh	88	11	45	3	6.6	Monobel	4.4	Air and electric
Monongahela River	Pittsburgh	78	12		2	9.0	Monobel	5.9	Electric
Upper Monongahela	Pittsburgh	96	11	24	3	6.8	Monobel	6.6	Air
Perry Co., Ky.	No. 6	66	36		4	9.0	FFF Black	9.8	Electric
Perry Co., Ky.	No. 6	54	24		3	11.6	FFF Black	5.0	Electric
Perry Co., Ky.	No. 6	66	24		3	10.6	FFF Black	5.3	Electric
Western Kentucky	No. 9	54	22		3	5.7	FFF Black	6.2	Electric
Western Kentucky	No. 11	78	32		5	9.3	FF Black	6.4	Electric

* Average

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*Howard N. Eavenson and Associates, Union Arcade Building, Pittsburgh, Pa.

Drilling Holes in Coal and Rock

2

4

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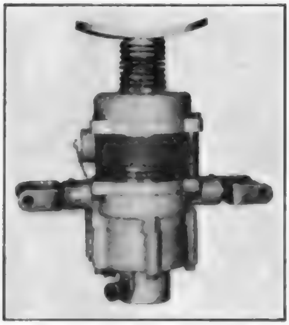

FIG. 8. ONE-MAN ELECTRIC AIR DRILL

plant is far easier than turning the cranks of a whimble drill or coal auger.

Fig. 2 shows a quite different arrangement. Here the drill motor is mounted between guides in a special post that is wedged between the floor and the roof. The drill, which is a Jeffrey Manufacturing Co. tool, is not only revolved electrically but has a power feed also. A light truck is provided for moving the machine, together with its post mounting and cable reel, about the mine. The wheeled bracket on the post facilitates movement of that member to and from the truck, as the apparatus by this means may be trundled along wheelbarrow-wise.

In Fig. 3 the motor-driven drill is so powerful that two men are required to manipulate it and force the auger into the coal. That this work is not laborious is clearly indicated. Men do not smoke when they are working hard. This drill is manufactured by the Chicago Pneumatic Tool Co.

Fig. 4 shows the Fort Wayne electric percussive drill with tripod mounting, intended for work in rock. It is shown making holes for the brushing of top but it must not be supposed that all four men are needed to operate the machine. At least two of those here shown seem to be engaged principally in bossing the job. This is one of the drills of the General Electric Co.

Fig. 5 shows a Howells Mining Drill Co.'s machine arranged with post and lead-screw feed. In this case the drill operatives merely steady the machine while its own rotation feeds it forward. A split nut engaging the lead screw and attached to the post permits quick change of bits, while the telescoping post allows of rapid setting up and greatly facilitates moving from place to place.

In Fig. 6 is shown a drill entirely different from those previously pictured. This is a light percussive pneumatic hand drill or pick hammer made by the Sullivan Machinery Co. and may be used in either coal or rock.

The Howells machine shown in Fig. 7 is intended for hand drilling in hard coal. As may be seen, it consists of a back-geared hand drive adjustably mounted on an adjustable post. A splined lead screw working in a split nut forces the auger forward into its work. Adjustable throw cranks at 180 deg. from each other make the turning easy.

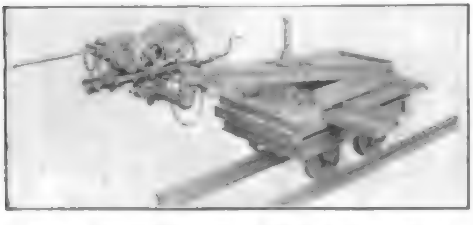

FIG. 9. DRILL MOUNTED ON BOOM OF MINE TRUCK

Fig. 8 shows a compact type of driving mechanism evidently intended for one-man operation. The spring-mounted breast strap and the D-handles upon either side are details worthy of note in this machine. This is a Pneumelectric Machine Co. drill.

Fig. 9 shows a mounting intended for operating from the room or entry track only. Here a light truck is fitted with a boom that may be raised or lowered by the action of a jackscrew. It may also be swiveled and locked in any position. From the forward end of the boom a swinging saddle arm projects, upon which the saddle that bears the drill is mounted. It will be immediately apparent that the drill may be raised, lowered, swiveled or tilted into any desired position. This is an arrangement for use with the Fort Wayne drill.

Figs. 10 and the frontispiece show hand-operated percussive air drills to work in either coal or rock.

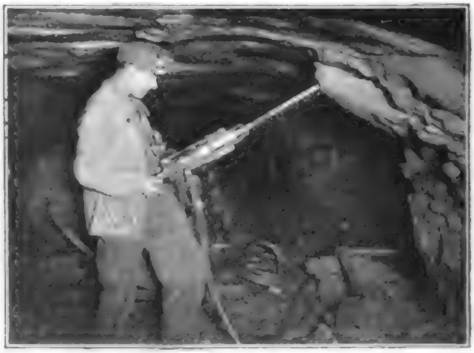

FIG. 10. DRILL DRIVEN BY ELECTRIC COMPRESSOR

In Fig. 10 the drill, a Sullivan rotator, is shown making holes preparatory to taking down top. The electric compressor from which this machine draws its air supply may be seen behind the driller. This compressor is truck-mounted and several drills may be operated from it. In the frontispiece a similar drill, a Jackhamer, made by the Ingersoll-Rand Co., is shown at work in an anthracite coal face. Although of percussive action this machine is in this case fitted with a steep-pitch helical bit. Thus as the percussive point is rotated the chips or cuttings are withdrawn from the hole. This same result may be accomplished in the case of the machine shown in Fig. 10 by exhausting the air through a hollow drill steel, thus blowing out the cuttings.

IN THE COURSE of mine-subsidence investigations, engineers of the U. S. Bureau of Mines have recently noted the effects of longwall mining on masonry buildings on the surface in the vicinity of La Salle and Spring Valley, Ill., where coal had been removed many years previously. Stone and brick buildings were found to be only slightly damaged. Quite different results were noted in an examination of a school building at Henryetta, Okla., from beneath which coal had been removed by pillar-and-room method. This building was so badly damaged by subsidence that it will have to be torn down.

Low Voltage in Mine Not Only Impedes Operation but By Wasting Electric Energy Increases Costs

Counter-Electromotive Force Alone Saves Motor from Acting as Short-Circuit—Where "Weak Power" Is Furnished Energy Is Wasted, for Motors Run at Low Efficiency and Work Is Spent in Forcing Current Through Line

BY E. D. KNIGHT*
Kayford, W. Va.

PRACTICALLY every executive who has controlled in any degree the operation of an electrified mine is familiar with the effects of reduced voltage or, as it is usually designated by machine and locomotive runners, "weak power" or "poor juice." Yet in how many instances does the mine foreman or superintendent consider this apart from the standpoint merely of annoyance and impeded operation? He knows that low voltage at the face means slower cutting and dissatisfied machine men. He knows that low voltage at the partings means smaller trips and slower hauls. He should know also that more machine and locomotive armatures are burned out when the voltage is low than when it is that, or nearly that, for which the machinery was designed. But does he realize the continuous loss in dollars and cents that operation with an excessive drop in voltage involves?

To understand clearly what that loss is the executive should have a practical, albeit rudimentary, knowledge of the manner of operation of the motors used to drive cutting machines and locomotives. Anyone who has operated a direct-current motor of fair size knows that if electric energy is applied to the brushes without first being passed through a resistance, or "starting box," the machine may burn out before it attains normal speed. He also knows that when a motor stalls and its armature ceases to rotate if the current is not soon turned off, the machine will go up in smoke. The logical conclusion, therefore, would be that the revolving armature must in some way limit the flow of current through its windings so as to reduce it to a safe value. But how?

COUNTER-ELECTROMOTIVE FORCE IS SET UP

The armature of a direct-current generator carries coils of insulated copper wire imbedded in slots in its surface. By causing this armature to revolve, these coils are passed in front of pole pieces, which are magnetized by the current which flows through the wire that is wound around them. In revolving these armature coils they thus pass through magnetized areas known as "fields" and in cutting them an electric current is caused to flow through them to the commutator and thence through brushes to the line by way of a switchboard and suitable control devices.

The construction of a direct-current motor is almost identical with that of a generator; in fact, either one will operate with more or less success if put in the place of the other. Obviously, then, the rotation of the armature of a direct-current motor must cause current to flow from its coils to the line. But to make this armature rotate, current is being fed from the line to it. As a result within the coils of every revolving motor armature two electric currents are flowing. These move in opposite directions and both at the same time.

The electric current passing depends upon three factors: The pressure, the volume and resistance as measured respectively in volts, amperes and ohms. The volt is the unit of pressure and the ohm the unit of resistance to this pressure. One ampere is the amount of current which one volt of pressure will force through one ohm of resistance. Every conductor of electricity has a certain resistance value. This may be expressed in ohms and depends upon the cross-section of the conductor, its length and relative conductivity and, to a lesser extent, upon its temperature. From the above Ohm's law is evolved and may be expressed as follows: $R = \frac{E}{I}$, $E = IR$, or $I = \frac{E}{R}$, when R, E and I represent the resistance, volts and amperes respectively.

VOLTAGE IS LOWERED BY OPPOSING VOLTAGE

The two electric currents which flow against each other in the coils of a direct-current motor armature must each have a certain voltage, and the resultant potential actually existing would, therefore, be only the difference between the two. Consequently to find the number of amperes flowing through the armature windings of a direct-current motor we must change Ohm's law to read: $I = \frac{E - e}{R}$, letting E and e equal respectively the voltage from the line and that generated in the windings.

Thus in the revolving armature the voltage generated within its conductors is responsible for limiting the flow of current through them to a safe value. On the other hand, with the armature at rest, there is nothing to prevent an excessive inflow of current. This is true also until the speed of rotation is sufficiently high to generate a current that will neutralize part of that fed in from the line. That is why "the starting box" is an essential part of the motor circuit. Electromotive force is another name for voltage, and as the generated potential is counter to the applied voltage it is called counter-electromotive force.

The watt is the unit of power. One ampere does one watt of work when being passed through one ohm of resistance by one volt of pressure. Thus the wattage of any circuit is the product of the volts multiplied by the amperes which flow therein. Motors are rated in horsepower, one horsepower being equal to 746 watts. If a motor produced a counter-electromotive force equal to that applied in driving it, naturally no current would flow. As in every case a certain amperage does flow, however, the counter-electromotive force must be always lower than the line voltage.

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As in a generator the output in watts is the product obtained by multiplying volts generated by amperes flowing in the circuit, so in a motor the wattage converted into useful work is the product obtained by multiplying the counter-electromotive force by the amperage. The input in watts to the same motor is the product obtained by multiplying the volts applied from the line by the amperes. The loss is therefore the difference in watts between these two results. Thus it may be seen that the nearer the value of the counter-electromotive force comes to that of the applied electromotive force, the loss will be the difference between input and output in watts and, therefore, the smaller will be the loss and the higher the efficiency of the motor. By the efficiency of a machine we do not, of course, mean its ability to do the work required of it, but to do it with a minimum of power loss. It is measured by comparing power used with power input. This efficiency, as it is directly proportional to it, is expressed in terms of counter-electromotive force. Thus if we say a 250-volt motor is 90 per cent efficient, we mean that 90:100:: the counter-electromotive force: 250. In the particular motor in question, therefore, the counter-electromotive force is 225 volts.

The higher the efficiency of a motor, the more power paid for is usefully consumed, but until we reach 50 per cent each decline in efficiency increases the capacity of a given motor, but does it at a great waste of energy, or, what is the same thing where power has either to be made or purchased at a great waste of money. The following examples will prove this point:

Let the resistance of a given motor circuit, expressed as $R = 0.3$ ohm and the electromotive force expressed as $E = 250$ volts. The counter-electromotive force we will express as e, the amperes as I, and the watts as W. Then at 90-per cent efficiency,

$$I = \frac{E - e}{R} = \frac{250 - \left(\frac{90}{100} \times 250\right)}{0.3} = \frac{250 - 225}{0.3} = 83.3 \text{ amp.}$$

Then for input watts,

$$W = E \times I = 250 \times 83.3 = 20{,}825 \text{ watts}$$

and for output watts,

$$W = e \times I = 225 \times 83.3 = 18{,}743 \text{ watts.}$$

The loss is, 20,825 — 18,743 = 2,082 watts.

Again at 50-per cent efficiency:

$$I = \frac{E - e}{R} = \frac{250 - \left(\frac{50}{100} \times 250\right)}{0.3} = \frac{250 - 125}{0.3} = 417 \text{ amp.}$$

Then for input watts,

$$W = E \times I = 250 \times 417 = 104.250 \text{ watts}$$

and for output watts,

$$W = e \times I = 125 \times 417 = 52.125 \text{ watts.}$$

The loss is, 104,250 — 52,125 = 52,125 watts.

Still again at 30-per cent efficiency:

$$I = \frac{E - e}{R} = \frac{250 - \left(\frac{30}{100} \times 250\right)}{0.3} = 583 \text{ amp.}$$

Then for input watts,

$$W = E \times I = 250 \times 583 = 145{,}750 \text{ watts}$$

and for output watts.

$$W = e \times I = 75 \times 583 = 43.725 \text{ watts.}$$

The loss in this case is 145,750 — 43.725 = 102.025 watts.

From these figures it may be seen that though a motor will give a greater output at low efficiencies, it can neither be constructed nor operated economically. All motors are designed for fairly high efficiencies and it is the intention that they shall have a certain load to carry while operating. If one is placed at the end of a line wherein an excessive voltage drop occurs, naturally a lower voltage is fed into its armature. Consequently because of its decreased speed a lower counter-electromotive force is generated within its coils. As it must carry a given load expressed in watts, with this lowered counter-electromotive force more amperes must flow through its windings to produce the required result. As this current value exceeds that which the windings are designed to carry, heating ensues, which often results in a burned-out armature.

Let us suppose that the demand for output watts is 18,743, as in the firse example, but that this has to be obtained with a potential of only 150 instead of 250 volts.

$$\text{As } W = e \times I;\ e \times I = 18{,}743 \text{ and } I = \frac{18{,}743}{e}$$

$$\text{But } I = \frac{E - e}{R} = \frac{150 - e}{0.3}$$

$$\text{Therefore } \frac{150 - e}{0.3} = \frac{18{,}743}{e}$$

$$150e - e^2 = 18{,}743 \times 0.3 = 5{,}622.9$$

$$e^2 - 150e = -5{,}622.9$$

$$e^2 - 150e + 75^2 = -5{,}622.9 + 75^2 = 2.1$$

$$e - 75 = 1.45$$

$$e = 75 + 1.45 = 76.45$$

$$\text{Efficiency} = \frac{76.45}{150} = 51 \text{ per cent.}$$

Note that to get the work out of the motor when the voltage has fallen 100 volts it is necessary to reduce the efficiency to 51 per cent from 90, which is a conscienceless waste of power. An easy calculation will show that the current with have to rise from 83.3 amperes (which was that with 250 volts) to 245 amperes with 150 volts. With 125 volts the motor cannot be made to give the necessary power regardless of efficiency. But if it could be made to do so the results would be disastrous to the equipment, as such large currents would be used that the motors would be burned out.

Because, as stated earlier, any conductor has a fixed value of ohmic resistance, dependent upon sectional area, length and relative conductivity, it follows that the greater the load in amperes that must be forced through a given conductor, the more excessive will be the drop in voltage.

Take, for instance, 20,010 ft. of 0000 copper wire, which has a resistance of one ohm. Using the equation of Ohm's law, $E = I \times R$, for 100 amperes, $E = 100 \times 1 = 100$. Consequently with a normal line voltage of 250, a motor on the end of a circuit consisting of 20,010 ft. of 0000 wire, which requires a current of 100 amperes to operate, would be receiving a voltage of only 250 — 100 or 150 volts, the other 100 volts being wasted in forcing current to the motor. If the same motor required only 50 amperes, then as in this case $E = 50 \times 1 = 50$ and 250 — 50 = 200, current at 200 volts would be fed to the motor.

Again, if another 0000 line were tied in, doubling the capacity of the old line, there would be only one-half the resistance of 0.5 ohm. This would halve the drop in voltage in each case, so that in the first E would be equal to 100 × 0.5, or 50, and in the second *E* would be 50 × 0.5, or 25 volts. The same result would be obtained also by moving the motor to a point half way between its original position and the source of power supply, as that would halve the length of the feeder and therefore correspondingly decrease the resistance.

A direct-current circuit consists of two parts—the positive or "hot" line and the negative, return, or "dead" line. As the opening of a switch in either conductor will result in the stoppage of all flow of current, it can be assumed that the current flows through the positive line to the motor and back through the negative line to the generator. Consequently in calculating the line drop the resistance of both lines or that of the total or complete circuit must be considered.

Too small a conducting circuit invariably results in a loss of power. In any case the multiplication of the figure for total loss in kilowatts by the price paid per kilowatt-hour will give the loss in dollars and cents for each hour's operation of such a circuit. This loss is entirely apart and distinct from that sustained through the reduced capacity and retarded operation of the mine.

Declares American Coal Miners Are Not As Careful as Foreigners

R. M. Lambie, chief of the Department of Mines of West Virginia, in an address at the meeting of the Clarksburg Mining Institute on April 20, said that the percentage of accidents in coal mines was greater among Americans than among foreigners. Pointing out that in 1921 there was one fatality for every 342 American miners, he said that among Hungarians the fatality was only one for every 645 miners. He went on to say that negroes, Italians and Spaniards were among the most careful men in avoiding accidents.

In urging miners and foremen to make themselves more efficient, he said: "From my own observation, I have seen hundreds of dollars worth of material lying idle. Piles of mine timbers are left behind in rooms, for after they get a little way from the face the miners order a fresh supply rather than carry them, and the result is that one-third of the total amount of mine timbers that are taken inside are never used. The rooms and entries are driven up and stopped, and the result is that rails, spikes, ties, fishplates, etc., are covered up with slate, and when the time comes to attack the pillars the falls have become so heavy that a new haulway is driven along the side of the former roadway and the supplies are lost for all time.

"Our present system of developing the mines in which the pillars are left standing for years is a very expensive and inefficient one, not only in cost of production but in the loss of coal. As soon as places have advanced their distance, the pillars should immediately be taken out, as the track is already laid and there are no slate falls to clean up and no places to retimber, as the timber that was set advancing is generally in good condition; in fact, a great portion of it could be recovered and used in other sections, as could the rails, ties and spikes."

Other speakers at the meeting of the institute were C. H. Hetzel, Jr., of Charleston, director of mine service stations; Robert Lilly, mine inspector, of Mount Hope; William Riggleman, of Fairmont; E. L. Griffith, mine inspector, and Hugh Smith of Clarksburg. E. P. McOlwin, institute president, introduced the speakers.

Plant Established to Reduce Timber Costs Is Operated Largely by a Single Boy

At the Edna No. 1 mine of the Hillman Coal & Coke Co., near Irwin, Pa., the roof requires much support and to preserve the timber from decay all large posts are treated with Protexol wood preservative. The ties also are similarly treated. One boy is engaged in this work, but he is assisted at odd times by handy men from the near-by tipple. After they are treated the timbers are raised to the level of the mine rail by the same chain-and-dog elevator which lifts the untreated timber. When posts have to be dropped in the tank, lifted out or moved from place to place the boy calls on the men at the tipple, who do the work when not otherwise employed. The men do not find that this calls for much of their time, and most of the boy's energy is expended in peeling the bark from the round timbers and in trimming the ties.

TREATING PLANT FOR TIMBER AT EDNA NO. 1

At this mine timber is treated as part of a regular routine, not a process to be done now and again when the notion appeals. The boy in the illustration is engaged in peeling one of the large oak timbers, for which purpose a heavy draw knife is used. Several of these timbers which have already been peeled are seen in a lean-to position, directly to the right of the boy.

The large oak timbers are 10 in. in diameter and 11 ft. long. The boy is able to peel and treat twenty of this size in eight hours. He can trim sixty-five large ties of 5 x 5-in. cross-section or 100 smaller ties with a section of 3 x 5 in.

The 10-in. round timbers are immersed for 2½ hours, and the tank will hold seven timbers of this size at one time. When working on the larger material the boy, with the help of the tipple men, immerses three batches in one day, each batch comprising seven timbers. The treatment of the ties takes less time and they do not occupy as much room as round timbers. The period of submergence for these need not exceed an hour and the tank will hold from thirty to fifty ties, depending on the size. Consequently, the tank will treat more ties than the one boy employed can trim in a day.

The treatment tank is of reinforced concrete. The inside floor dimensions are 12 x 3 ft. and the depth is 20 in. The bottom slab is 8 in. thick and the sidewalls are 8 in. through on the bottom and 6 in. at the top. The sidewalls are reinforced with ½-in. worn-out steel cable, which is formed into rectangular loops lying in a horizontal plane. This cable is placed every 2 in. throughout the height of the tank. Three ¾-in. steam pipes rest on angle irons at the bottom. These keep the preservative material at the desired temperature.

A STUDY OF THE APPLICABILITY of the geophone for delimiting fires and squeeze areas has been undertaken by the U. S. Bureau of Mines at Scranton, Pa. Alan Leighton, who has made a special study of the use of the geophone in mining operations, has been detailed to make the investigation.

How to Reduce Power Costs, Increase Coal Cut and Save Steel by Handling Bits Judiciously

Methods Adopted in Supply of Cutter Bits—In Shafts Enough Bits to Run Three Days Without Sharpening May Be Needed—To Each Machine Its Own Bits—High-Carbon Steel Better Than Low-Carbon or Alloy Steel

By Charles B. Officer*
Chicago, Ill.

PRIOR to the war many coal operators, realizing the advantage—in fact, the necessity—of having better cutter bits for their chain mining machines, had conducted many experiments and tests at their mines to determine how the greatest cutting efficiency could be attained. Several mines had progressed far enough with their experiments to establish fixed methods or rules for handling these bits. Other advanced ideas and theories were being considered with a view to cutting down costs for the blacksmithing and renewal of bits.

During the war the urgent demand for greater coal production, the scarcity of labor, the difficulty of obtaining proper material and many other items completely absorbed the mine operator's attention. In the rush of events many of the rules and methods which had been established for the mining of coal in an economical manner had to be abandoned. The shape and quality of the cutter bit at many mines deteriorated materially. Within the last year or so, in an endeavor to reduce operating expenses, many mines have reconsidered the results of former experiments on cutter bits and have tried to curtail their costs further by giving the whole subject careful consideration.

The cutter bit is the actual vital functioning part of any mining machine. It is the point of final application of power from the mining machine to the cutting of coal. The condition of the bits determines to a great extent the amount of coal which a machine can cut per shift. There also is a relation between the character of the bits and the amount of power consumed in cutting. The cost of mining-machine repairs is directly dependent upon the form, quality and quantity of cutter bits supplied to the mining machine.

MINER WAITED TILL HIS PICKS WERE SHARPENED

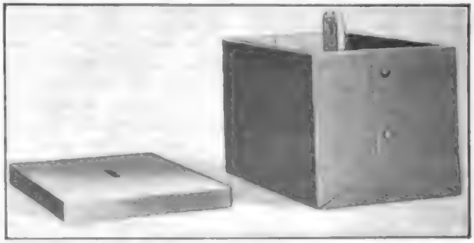
In the days when hand-mining methods were prevalent no one would consider sending a miner underground with hand picks improperly sharpened or hardened. Every miner, before going underground, would examine his picks carefully, as he knew from experience that the amount of coal which he could produce depended largely upon the condition of his tools. The cutter bits on a chain machine bear the same relation to the quantity of coal that a mining machine can cut as the old hand picks did to the quantity of coal which a hand miner could produce. These cutter bits should be given the same careful attention that the hand miner formerly gave to his picks, if the maximum efficiency and economy is to be obtained from chain mining machines.

The subject of cutter bits can be divided up into three general headings as follows: First, the handling of sharpened cutter bits from the blacksmith shop to the mining machines and the return of dull bits from the machine to the blacksmith shop. Second, the proper shaping or sharpening of the dull bit. Third, the proper selection of material for the particular conditions encountered in each mine.

When chain mining machines were first being installed it was the custom at many places for the machine runner and helper to carry the sharpened bits in with them at the start of a shift's work. The dull bits were returned by them at the end of the shift. If the cutting proved harder than anticipated, and the supply of sharpened bits accordingly was depleted, the helper was required to make a trip to the blacksmith shop for others to replace them. Much time and tonnage were lost by this system of handling the bits in and out of the mine. With the advent of more machines underground, improvements in the methods of supplying the bits into, and out of, the mine were developed, so that the chain machines would be provided with plenty of sharpened bits at all times and there would be no loss in the tonnage cut due to the waiting for a new supply of picks.

BITS CANNOT UPSET INTO BOTTOM OF CAR

Many different systems are employed to obtain the desired results but experiments with different methods of transporting the bits have led to the general conclusion that some form of metal container is most suitable. Several types are in use. The bit box shown below, made by the Mine Safety Appliances Co., is well designed. Such a box will hold approximately 50 bits, which consequently will replace between one and two complete mining-machine sets, depending, of course, on the length and type of cutter bar used. In order to have the transportation of the bit boxes on the pit cars as safe as possible it is better to use a box so con-



BOX FOR THE BITS OF CUTTING MACHINES

If the bits are put in a lettered box for a specific machine bearing the same letter, there is less likelihood of a machine being inadequately rationed and track can be kept of the number of bits used.

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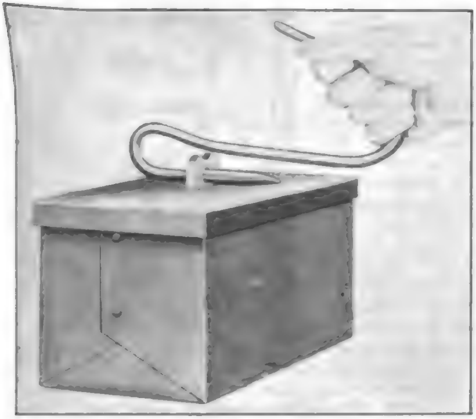
*Sullivan Machinery Co.



BIT BOX FILLED AND CLOSED FOR SHIPMENT

An upright standard in the center of the box, over which the slotted cover is passed, is provided with a hole through which a double hook handle is slid, holding the box lid tight.

structed that it can be hooked onto the end of the pit car rather than put in the bottom of an empty or dropped in among the coal on a car that is loaded.

At slope or drift mines, by availing oneself of the movement of the pit cars bits may be carried in and out of the workings at any time during the shift. In shaft mines, where it is desirable to maintain production up to the maximum capacity of the cages, more systematic methods have to be employed. Some shaft mines have found it economical to have such a large quantity of bits on hand that they can keep a full shift's supply of bits at the machine and an equal number at the blacksmith shop being sharpened for the next day's operation. In this way the sharpened and dull bits can be lowered and hoisted at the same time as the other supplies that are needed in the mine. Where such a system is used the total quantity of bits on hand should be approximately two and one-half to three times the number of bits used by all machines in the mine during a shift.

In order to facilitate an equal and just distribution of cutter bits to the various mining machines the set of bit boxes for each mining machine should be stamped with a number corresponding to the number given the chain machine itself. Letters such as A, B, C, etc., on the boxes themselves will serve as a distinguishing mark for each individual box. When the containers are stamped with a number corresponding to that given a mining machine the bottom men can readily and correctly assort the boxes and place them in those particular mine cars that are going to the various territories where the mining machines are working to which the bits have been apportioned. At some agreed place in the territory of each machine the bit boxes should be unloaded from the pit cars so that the machine man may know exactly where he can always find a supply of the new bits.

Another advantage of having the containers separately numbered is that records thus can be obtained of the quantity of bits used by each machine per shift. To do this a count must be made and listed, at the blacksmith shop, of the number of sharpened bits put in each box and the number of dull bits returned. Where such records are kept and the tonnage output and repair cost of each mining machine are compared with the number of bits used the mine management has information which is quite enlightening. Allowance must always be made, however, for the variation in cutting conditions which the different sections of the mine present.

When chain mining machines were first installed, comparatively few bits were used, because each machine used only a few bits, because there were few machines at any one mine, and also because mines were not as systematically laid out in regard to cutting territories as at present, and the chain machines did not then produce the tonnage per machine that they do now. The blacksmiths were then able to sharpen the bits by hand and generally produced well-shaped and well-tempered bits. As time went on, and more machines were introduced, there was an increase in the number of bits which had to be sharpened daily. This increase did not permit the smith to give enough time to each bit to insure its proper shaping so long as the work had to be laboriously performed by hand.

Various types of power hammers were then introduced so as to increase the number of bits resharpened per shift by each blacksmith. These hammers did not have exact forming dies for shaping the bits and produced a properly shaped bit only when the blacksmith took the necessary, and by no means brief, time to hammer each bit into shape, and under the best conditions there was no assurance that two bits would be turned out identical in shape.

Within the last year a cutter-bit sharpening machine has been developed which insures that each bit after being sharpened will have the correct outline. This machine forges these cutter bits by passing the bits through forming dies, thus making it certain that each bit will have the proper shape and be identical with every other bit so sharpened.

A bit should have correctly proportioned clearance, side clearance and back-slope angles. The correct angles and an analysis of the reasons for each can be found in the Jan. 12 issue of *Coal Age*.*

ECONOMY OF HAVING BITS PROPERLY SHAPED

When cutter bits are of proper shape a larger tonnage is cut and the power consumption and repair costs are decreased. Thus equipped many mines have been able to decrease the power consumption of their mining machines from 20 to 25 per cent. Other mines, where the coal to be cut is fairly soft, have found that not only was there a reduction in the power consumed but also that with a set of these properly sharpened bits more places could be cut before the bits had to be renewed than could be cut with their old-type bit.

This saving in the time required to set bits has resulted in greater tonnage output not only in the beds that are easily cut but also in those that are of greater hardness. Although no definite figures have been obtained as to the saving in repair expenses, as these bit-sharpening machines have not been installed long enough to have this saving in renewals accurately determined, it is believed from the results which have been obtained so far that there will be a reduction of between 10 and 15 per cent in this item.

The third consideration—namely, the selection of the bit material and the proper heating for sharpening and hardening—is closely allied to the proper shaping of the bit. Various grades of steel have been tried at different times for cutter-bit steel. The cheaper steels, having a very low carbon content, have proved unsatisfactory. High-carbon steel of medium price has given good results. Expensive alloy steel has been tried and has been found not to be as satisfactory as high-carbon steel.

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*Page 47.

Steel of low carbon content (from 0.10 to 0.30 per cent carbon) cannot be tempered so as to produce a satisfactory cutting tool. Such steel quickly dulls and even when properly shaped the bit requires constant resetting. This steel readily bends upon striking any hard obstruction in the coal, and, because of the low carbon content, it cannot be hardened so as to retain its cutting edge.

The high-priced alloy steels, when properly shaped and tempered, give a bit that would make a clean, even kerf in the coal, if no rash, sulphur balls, etc., were encountered. We are always hoping for such conditions, but never find them. The alloy steel on striking impurities is readily broken. Alloy-steel bits are more brittle than high-carbon steel and for this reason break more readily than the high-carbon bits when they strike impurities in the coal. The loss of material through these broken bits and the high price paid for this material more than offset all the other advantages which this steel has shown in cutting other materials.

From actual experience it would appear that steel around 0.70 per cent carbon and 0.25 to 0.35 per cent manganese will give the most economical results. Some mines have obtained better results by using a steel of slightly higher carbon content and others have obtained greater efficiency by using one of high carbon percentage with a small percentage of chrome and nickel. The disadvantage of having too high a carbon content in the steel is in the fact that such a steel is easily spoiled in the blacksmith shop by overheating and that unsatisfactory results are obtained from these bits underground. Steels having a carbon content around 0.70 per cent have a sufficiently wide range of temperatures at which they can be forged and hardened so that with ordinary care and attention they are not likely to be burned.

BOX HUNG ON HIND RAIL OF CAR

Bits should not be laid in an uncovered box in the bottom of the coal wagon, for when thus promiscuously handled they may be lost only to turn up unexpectedly and unwelcome in the jaws of a crusher.

The proper hardness to give the bits depends largely on local conditions. A good rule is to have the bits so tempered that some come back bent while others are broken. Those that are bent are not hardened sufficiently, while those that break are too hard. If about an equal number of the dulled bits are bent and broken it indicates that the steel is being tempered on the average about right for that particular set of cutting conditions.

It has been the practice in forging and tempering bits to heat the bits all over. When this is done not only is the cutting end of the tool hardened but also the back of the bit and then it is much more difficult to hold the bit in the cutter chain, as the setscrews cannot be so readily caused to bear into a hardened substance as into an unhardened one. The bit can be shaped and hardened just as easily when the end alone is heated as when the whole bit is submitted to the heat of the fire. In places where the bits are hardened all over the repairs on the cutter chains and cutter-chain setscrews are found to be higher.

ROLLER DIE OF BIT SHARPENER

Cutter bits are passed through forming dies so that each bit will have the exact shape desired.

How To Reduce Undercutting Costs

As a result of these studies the following recommendations are made to coal-mine managers:

(1) Provide adequate containers for carrying the bits and establish a proper system of transportation and recording, so as to keep track of the number of bits used by the different machines under different conditions.

(2) Equip mine blacksmith shops with apparatus to resharpen the bits to these specifications, quickly and at low cost and thus obtain the advantages of properly shaped and absolutely uniform bits.

(3) Purchase the proper steel for cutter bits and see that the bits are intelligently and carefully heated and tempered for the particular conditions prevailing in each mine. Lay special emphasis on the importance of exercising care to avoid the burning of steel.

If these relatively simple requirements are constantly observed, large economies will be effected in labor, in power consumption and in mining-machine repairs, with a corresponding increase in the rate of production.

IN THE PHYSICO-CHEMICAL STUDY of sulphur in coke being made by A. R. Powell, physical organic chemist of the U. S. Bureau of Mines at Pittsburgh, Pa., experiments have been conducted on the study of the decomposition of calcium sulphide. It was found that, working with boiling water at 100 deg., calcium sulphide is hydrolized very slowly, the rate being increased by the addition of magnesium oxide. Small-scale laboratory tests will be made on coke containing fairly pure calcium sulphide to discover if it is feasible for desulphurizing coke.

IN THE STUDY of the distillation of Freeport coal being made at the Pittsburgh Experiment Station of the U. S. Bureau of Mines, duplicate samples of the bone and cannel constituents of the Freeport seam have been distilled at low temperature in 12-lb. lots. A sample of the bottom section of the clean coal also was distilled. From a comparison of the yields it would seem that the bone and cannel constituents of this seam should be of too great value to be treated as refuse.

Census Figures Prove That Output Per Man Advances With Increase in Use of Mining Machinery

Nearly 50,000 Electric Motors Are Used at Coal Mines—From Two to Four Horsepower, Roughly Speaking, Is Installed per Employee and the Output per Horsepower Is in General Between 200 and 350 Tons

By Frank H. Kneeland*
New York City

SELDOM can those engaged in any large industry visualize its dimensions, either in detail or in their entirety. Few men unaided ever gain a clear view of the coal industry, perceive its trends, sense accurately its tendencies or gage and analyze their portent. Nevertheless, we, who make coal production a business, sometimes gain astonishing glimpses of our calling from purely outside sources.

Figures presented by the report of the 14th Census of Mines and Quarries of the United States, covering the year 1919, are of unusual interest. Some of the more salient data, so far as those interested in power and its consumption at the mines are concerned, are set forth in the accompanying table. Though the figures thus tabulated show much that is of interest to the mining man, they fail to enumerate certain facts that he would gladly know. Thus the total horsepower of the prime movers employed in the industry is shown by states, as is also the number and horsepower of the motors operated on purchased energy, as well as the number and rated capacity of those operated from current generated. But the rating and number of the generating units installed is not set forth; neither is the number of horsepower- or kilowatt-hours consumed.

Fifteen Thousand Prime Movers at Mines

As may be seen in the accompanying table, the prime movers of the industry include 13,507 steam engines, 360 steam turbines, 1,323 internal-combustion engines and 3 waterwheels. The average rated capacity of the steam engines is slightly over 130 hp., that of the steam turbines 687 hp. each, of the internal-combustion engines 17.4 hp., and of the waterwheels 150 hp. Generation of energy produced at the mine plants required the burning as fuel of 9,573,978 short tons of anthracite and 11,228,270 net tons of bituminous coal; also 24,603 bbl. (about 948,120 gal.) of fuel oil and gasoline; 976,820,000 cu.ft. of natural gas, 564 cords of wood and 25 tons of coke. Figures on the coal burned at the mines of the State of Alabama, however, include 14,254 tons of coke. The coal industry also employed 47,829 motors averaging 37 hp. each.

In the accompanying table, columns 1 to 21 inclusive are taken direct from the census report referred to. Column 22 shows the production of the various states in net tons. These figures are those of the U. S. Geological Survey. The figures in succeeding columns except No. 30 are all calculated from those previously presented. Thus column 23, showing the tons of coal produced annually per horsepower installed, is obtained by dividing the tons of production shown in column 22 by the aggregate horsepower as shown in column 3. The fractions given in the footnote of the table show how the results set forth were secured. Thus in the case just cited the fraction $^{22}/_{3}$ indicates that the figures in this column are the quotients obtained by using the figures of column 22 as dividends and those of column 3 as divisors.

Column 24 shows the horsepower installed per employee. These results were obtained by dividing the figures of column 3 by those of column 2. Column 25 shows the tons produced per man employed, the results set forth being obtained by dividing the productions of the various states, column 22, by the number of men there employed, column 2. Column 26 shows the percentage of installed motor horsepower operated on purchased current, and column 27 shows the apparent percentage of electrification. This is obtained by dividing the figures of column 16 by those of column 3. Concerning these results more will be said later.

Columns 28 and 29 are mutually complementary and show respectively the percentage of power used that was generated by the user and the percentage that was purchased. It is interesting to note that while the apparent percentage of electrification for the whole country is 58.3, the energy generated and the energy purchased are to the whole energy used 71 per cent and 29 per cent respectively.

Columns 23, 24 and 25 are highly interesting. From

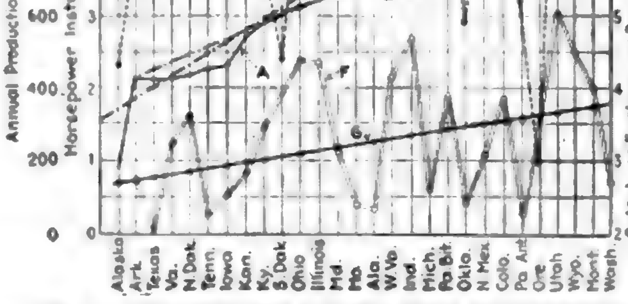

FIG. 1. HOW TONNAGE VARIES WITH HORSEPOWER PER EMPLOYEE

States are arranged in order of horsepower installed per mine worker, the graph *A* showing this relation. The yearly production per man is shown by graph *B*, the profundities for Pennsylvania anthracite and Oregon being the natural outcome of difficult mining conditions. *C* and *D* are straight lines representing average annual production per man employed and average power installed per employee respectively. A similar average line, *E*, has been drawn for average power installed per employee in the level coal bed regions. *F* shows output per man per day and *G* is a line averaging this graph.

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the first, or column 23, it will be seen that the amount of coal produced per horsepower installed varies from a minimum of 34 tons in Oregon to a maximum of 498 tons in Alaska. Both of these figures, however, probably are abnormal. Most of the figures representing production per horsepower given in this table lie between 200 and 350 tons. Few of the larger coal-producing states lie beyond this range in either direction.

Columns 24 and 25, showing the horsepower installed and the tons produced per employee respectively, may advantageously be considered together. We may well inquire if any relation exists between these two quantities. The interconnection between them probably is brought out more forcibly in Fig. 1 than in the table. In this figure, beginning with Alaska, which is obviously both unimportant and underpowered, most of the work there done being in the nature of exploration, the states are arranged from left to right in the order of their respective horsepower installed per employee. These quantities have been plotted as ordinates, so that the solid-line curve *A* can be drawn. This curve immediately reveals some striking facts.

Most of the coal-producing states have installed less than 4 hp. per employee. With the exceptions of Kentucky and Virginia, no state producing 10,000,000 tons or more has installed less than 3 hp. per employee. With one exception also all fields wherein the amount of power per employee exceeds 4 hp. lie in the West, in what might be termed the mountain coal fields. This

COMPARISONS BETWEEN U. S. CENSUS FIGURES ON POWER AND U. S. GEOLOGICAL SURVEY FIGURES ON PRODUCTION PER EMPLOYEE

State (1)	Persons Engaged in The Industry (2)	Aggregate Amount Of Power Used H.P. (3)	Steam Engines: Number (4)	Steam Engines: Horsepower (5)	Steam Turbines: Number (6)	Steam Turbines: Horsepower (7)	Internal Combustion Engines: Number (8)	Internal Combustion Engines: Horsepower (9)	Total Horsepower Of Prime Movers Installed (10)	Amount of Power Purchased Horsepower (11)	Motors Operated On Generated Current: Number (12)	Motors Operated On Generated Current: Horsepower (13)	Motors Operated On Purchased Power: Number (14)	Motors Operated On Purchased Power: Horsepower (15)	Total Horsepower Of All Motors Operated (16)
Alabama	26,162	97,039	415	56,802	4	1,367	30	774	59,017	38,022	671	25,311	868	38,022	63,333
Alaska	164	151	8	129	...	......	6	23	152	......	1	10	......	......	10
Arkansas	2,862	6,137	76	5,190	1	100	11	752	6,042	95	25	783	3	95	878
Colorado	12,017	63,016	274	30,327	2	1,050	4	84	31,461	31,555	253	10,481	785	31,455	41,936
Illinois	77,825	247,142	1,609	186,926	36	17,725	88	1,126	205,777	41,365	3,165	95,916	1,070	41,365	137,281
Indiana	25,911	99,585	687	78,912	15	1,902	64	344	81,158	18,427	817	41,890	407	18,427	60,317
Iowa	11,239	26,123	214	13,389	4	1,690	55	806	15,885	10,238	67	4,119	288	10,233	14,352
Kansas	8,622	23,434	353	18,978	...		36	356	19,334	4,100	37	1,041	233	4,100	5,141
Kentucky	43,347	126,804	442	57,005	11	23,786	64	462	81,253	45,551	1,925	53,222	1,143	45,551	98,773
Maryland	5,180	18,660	172	12,302	1	750	24	516	14,018	4,642	94	3,872	139	4,642	8,514
Michigan	1,744	6,884	49	6,114	1	75	...	...	6,189	695	179	5,285	10	695	5,980
Missouri	7,852	28,385	362	24,394	5	335	92	706	25,435	2,950	130	3,123	140	2,950	6,073
Montana	4,056	27,077	60	14,679	13	4,350	11	103	19,132	7,945	145	5,239	185	7,945	13,184
New Mexico	3,774	18,063	15	2,745	11	10,548	2	40	13,333	4,730	250	5,104	125	4,730	9,834
North Dakota	939	2,037	28	1,530	...		38	253	1,783	254	9	100	24	254	354
Ohio	43,433	136,145	650	79,949	4	3,275	128	1,354	84,578	51,567	1,498	38,145	1,647	51,447	89,592
Oklahoma	8,296	36,483	277	29,187	4	700	31	253	30,140	6,343	142	5,159	207	6,343	11,502
Oregon	67	393	6	375	...	...	...	...	375	18	15	355	3	18	373
Pennsylvania	A154,882	899,783	5,298	730,141	45	50,665	73	1,284	782,090	117,693	3,801	185,723	1,881	117,693	303,416
	B165,044	658,963	2,194	348,402	100	86,273	319	10,015	444,690	214,273	8,045	278,788	5,953	214,208	492,988
South Dakota	18	49	1	35	...	.....	3	14	49	......	...	......	.....	......	......
Tennessee	10,170	22,946	146	19,093	2	928	49	722	20,743	2,203	263	10,520	73	2,203	12,723
Texas	2,862	6,137	76	5,190	1	100	11	752	6,042	95	25	783	3	95	878
Utah	3,926	24,029	40	7,755	4	2,085	...	...	9,840	14,189	143	7,764	276	14,189	21,953
Virginia	11,940	41,630	91	9,228	1	600	19	188	10,016	31,614	256	9,775	944	31,614	41,389
Washington	4,654	32,190	98	19,006	7	1,781	5	70	20,857	11,333	315	10,619	196	11,333	21,952
West Virginia	93,767	355,479	778	123,212	40	18,969	136	2,059	144,240	211,239	2,500	87,256	6,008	211,182	298,438
Wyoming	7,427	47,075	88	14,850	16	18,240	2	45	33,135	13,940	92	3,966	355	13,940	17,906
Total or average	738,178	3,051,840	14,507 av. hp. 130½	1,895,845	360 av. hp. 687	247,294	1,323 av. hp. 17.4	23,092	2,166,764	885,076	24,863	894,341	22,966	884,729	1,779,070

State	Coal Consumed as Fuel in Short Tons: Anthracite (17)	Coal Consumed as Fuel in Short Tons: Bituminous (18)	Liquid Fuel (Fuel Oil, Gasoline, etc.) Consumed Barrels (19)	Gas Used as Fuel 1,000 cu.ft. (20)	Remarks (21)	Tons of Coal Produced** (22)	Tons Produced Per Horsepower Used (23)	Horsepower Installed Per Employee (24)	Tons Produced Per Employee (25)	Proportion of Motor Horsepower Operated on purchased energy (26)	Apparent Percentage of electrification (27)	Percent of Power Used generated by User (28)	Per cent of Power Purchased (29)	Output Per Man Per Day, Tons (30)
Alabama		524,069*	1,140		*Inc. coke 14,254	19,184,962	197	3.71	733	60.0	65.2	60.7	39.3	2.42
Alaska		2,688	5			75,606	498	.93	461		6.6	100.0		
Arkansas		53,867	1,015	110,913		2,227,369	364	2.14	778	10.8	14.3	98.5	1.5	2.76
Colorado		286,909†	34		†coke 25 tons	12,407,571	197	5.25	1,060	75.0	66.4	50.0	50.0	3.88
Illinois		1,946,807	2,200			89,291,105	361	3.18	1,147	22.6	55.6	83.2	16.8	4.41
Indiana		705,031	1,037			30,678,634	304	3.84	1,185	30.6	60.5	81.5	18.5	4.72
Iowa		184,205	1,222			8,192,195	314	2.32	719	76.3	55.0	60.7	39.3	2.59
Kansas		170,666	362		60 cords wood	7,561,947	322	2.72	878	80.0	22.0	82.5	17.5	2.89
Kentucky		679,943	1,805			31,612,617	250	2.92	730	46.2	78.0	64.1	35.9	3.49
Maryland	2	46,262	.....		3 water wheels, 450 hp.	4,497,297	240	3.6	867	54.5	45.6	75.2	24.8	3.13
Michigan		83,824	.....			1,464,818	212	3.94	840	1.2	86.8	90.0	10.0	2.65
Missouri		143,433	1,014		400 cords wood	5,667,730	200	3.61	722	48.6	21.4	89.6	10.4	2.44
Montana		163,456	113			4,532,505	174	6.67	1,115	60.3	48.7	70.7	29.3	4.05
New Mexico		45,834	14			4,023,239	222	4.78	992	48.1	54.4	73.8	26.2	3.07
North Dakota		16,437	451			719,733	358	2.17	766	71.7	17.4	87.5	12.5	3.61
Ohio		675,165	1,516	2,468		45,812,943	336	3.14	1,057	57.3	65.9	62.2	37.8	4.41
Oklahoma	.....	177,267	507	154,570		4,813,447	132	4.4	581	55.0	31.5	82.6	17.4	2.45
Oregon		4,869				13,328	34	5.86	198	4.8	95.0	95.4	4.6	
Pennsylvania	A 9,573,985		2,052			A 98,826,084	110	5.8	640	38.8	33.7	87.0	13.0	2.14
	B	3,304,925	5,204	310,914		B 178,550,741	271	3.99	1,080	43.5	75.0	67.4	32.6	3.96
South Dakota		28	15			7,942	162	3.06	481			100.0		
Tennessee		141,222	540		104 cords wood	6,831,048	298	2.26	672	17.3	55.5	90.4	9.6	2.25
Texas		53,867	1,015	110,913		2,261,135	369	2.14	790	10.8	14.3	98.5	1.5	2.03
Utah		82,907	.....			5,136,825	214	6.14	1,318	64.6	91.2	41.0	59.0	5.03
Virginia		113,881	362			10,289,808	246	2.14	860	76.5	99.2	24.0	76.0	3.26
Washington		173,052	126			4,082,212	127	6.9	877	51.7	68.2	64.8	35.2	2.74
West Virginia		1,124,614	2,763	287,042		89,955,839	252	3.79	958	70.8	84.0	40.6	59.4	4.18
Wyoming		323,042	91			9,438,688	200	6.34	1,238	77.9	38.0	70.4	29.6	4.48
Total or average	9,573,987	11,228,270	24,603 984,120 gal.	976,620		678,137,368	225	4.13	917	49.6	58.3	71.0	29.0	3.322

**U. S. Geological Survey's tonnage report. In this table 23 = $\frac{22}{3}$; 24 = $\frac{3}{2}$; 25 = $\frac{22}{2}$; 26 = $\frac{15}{16}$; 27 = $\frac{16}{3}$; 28 = $\frac{10}{3}$ and 29 = $\frac{11}{3}$.

solitary exception is the anthracite region of Pennsylvania. It will be at once admitted, however, that this region, if not actually mountainous, is at least rugged both above and below ground, and no doubt many of the coal regions of the West are comparable physically to it. It is probable, furthermore, that the pitch of the beds determines the needed horsepower far more than does the contour of the surface, although both are doubtless important factors.

Now, by setting off the yearly production per employee in each state to a suitable scale as an ordinate and joining the points thus found, we get the dotted line or curve *B* of Fig. 1. This graph is highly erratic. Strangely enough its maximum and minimum are adjacent points on the curve and represent the yearly man-output of states comparatively near together. Thus Oregon had the lowest production per employee of any state in the Union, and its neighbor, Utah, had the highest, the exact tonnage figures being 198 and 1,318 respectively. Apparently some sinister influence was at work in Oregon during the year 1919.

Though curve *B* presents a ragged outline, it is interesting to note the similarity of the yearly outputs per man in states or in fields subjected to approximately the same physical and market conditions. Thus, note the similarity of output per employee in Virginia, Maryland and West Virginia. This resemblance is striking also in the cases of Indiana and Illinois, with which Ohio and the Pennsylvania bituminous region may be compared. It is probable, therefore, that if the states in this list were arranged according to their geographical locations instead of either alphabetically, as in the table, or according to their installed horsepower per employee, as in this figure, a much smoother curve would result.

Now, if we disregard the anthracite region of Pennsylvania, which, as everyone knows, is subject to conditions and problems peculiar to itself, and also neglect Oregon, where both mines and output are small and where apparently also either operating or market conditions or both were peculiar, we may draw a curve representing the average annual production per employee. This is shown as curve *C*, which, as here drawn, is a straight line. Similarly a straight-line curve or graph *D*, may be drawn showing the average power installed per employee.

YEARLY OUTPUT RISES WITH INSTALLED POWER

The important thing about curve *C* is not its actual height above the base line at any point or points but the fact that it has the same general slope—that is, inclines in the same direction—as curve *D*. This consequently shows that the average yearly production per employee in a general way increases with an increase of power installed per employee. Although this increase is not proportional to the power installed, yet notice how nearly the average production per employee, as represented by curve *C*, parallels the average horsepower installed per employee for the bituminous regions between Texas on the west and Pennsylvania on the east, as shown by curve *E*. This is the region of the country where the coal beds lie flat or pitch only moderately. The similarity of these two curves is remarkable and, I believe, significant.

This belief is much strengthened by the fact that if we consider the West or mountain coal field as a seperate region and construct for it average-power and out-put-per-employee curves as before, these also will be found to be nearly parallel. That this will be the case will be immediately apparent from a study of the figure, bearing in mind that the Pennsylvania anthracite field and Oregon are neglected in both curves.

Figures covering the coal output per man per day recently have been published by the U. S. Geological Survey. These are shown in column 30 of the table. In Fig. 1 these outputs have been plotted for the various states, the ordinate scale or that of tons per employee per day appearing along the right margin. It will be noted that in both figure and table the outputs for Alaska, South Dakota and Oregon are missing.

Joining the points showing the outputs per man per day for the various states and fields shown we get the jagged graph *F*. The average output per man, or the graph *G*, may then be drawn from inspection. This while by no means parallel with either *C*, *D* or *E*, has a similar slope, showing that in general the output per employee per day increases with an increase in the power installed just as does annual production.

HALF THE MOTORS RUN ON PURCHASED POWER

The figures set forth in column 26 of the table show the ratio existing between the horsepower of motors operated on purchased energy and the horsepower of motors operated on current generated by the user. For the country as a whole, just about one-half—that is, 49.6 per cent—of the electric motors operated are run on purchased power.

When we come to the figures of column 27 we reach a point where caution must be observed. It is an old saying that figures never lie. It has been my experience, however, that while most of them are honest, like most human beings, some of them are like some people and will bear watching. While they may not exactly prevaricate, they apparently have no particular aversion to practicing deception. In the case of the data here presented, unless care is exercised, false conclusions may be drawn.

Thus it would be easy to assume that the ratio of the total horsepower of all motors operated to the aggregate amount of power used would represent the true percentage of mine electrification. This conclusion, however, is by no means justified, as the ratio of rated installed capacity of the motors operated from mine generating plants to the rated capacity of these plants is not known. While some engineers advocate that the connected load on a generating station should not appreciably exceed the generating capacity, some mining companies have found it advantageous to make the connected load several times the rated generating capacity of their plants.

Thus one well-known firm in West Virginia operating a fairly large group of mines electrically from one central generating station has found it both feasible and advantageous to make the connected load 330 per cent of the generating capacity. Such instances as this, and they probably are by no means either isolated or exceptional, vitiate the figures presented under the heading "percentage of electrification" to an appreciable extent. The figures of column 27, therefore, are here presented and should be accepted with due reservation. They represent rather an interesting apparent indication than a real value.

Now, of course, the installed horsepower of either prime movers, or motors, or generators, whether in the aggregate or per ton of coal produced, is no criterion by which to measure the coal industry. The real yardstick both of electrification and of production is the horsepower-hour or kilowatt-hour. If we knew the ratio of the electrical horsepower-hours consumed in the coal industry to the total horsepower-hours consumed, we would have a true measure of the industry's electrification. It would be far more interesting and profitable to know the number of horsepower-hours required for the production of a ton of coal in the various states than to know the tons of production per installed horsepower as here set forth; more interesting to know the number of horsepower-hours expended yearly or daily per employee than the installed horsepower per employee. Unfortunately, however, few coal producers measure all of the energy they consume in these or any other units, and the Bureau of the Census had recourse only to the installed rated horsepower, which could be obtained both easily and accurately.

Thus, while, as stated at the beginning, the figures presented in the accompanying table and illustration leave much to be desired, they nevertheless furnish a means of drawing some interesting and valuable conclusions. The curves of Fig. 1, while possibly illogical in foundation and probably not absolutely accurate in detail, are nevertheless unmistakable in trend and portent.

Canadian, Utah and Idaho Fuels Give Most Heat of Those Entering Spokane Market

ANALYSES made by the staff of the School of Mines and Geology of the State College of Washington and exhibited by them at the Northwest Mining Convention, held at Spokane, Wash., Feb. 28 to March 5, 1921, show that some of the Canadian coals from the Rocky Mountain regions are leaders in calorific power, the best quoted, by a narrow and uncertain margin, being Green Hill mine-run, which ran as delivered, with 1 per cent of moisture, 14,635 B.t.u.

The coals Nos. 1 to 42 were furnished by Spokane fuel dealers and represent coals marketed in Spokane. Mine owners furnished samples Nos. 43 to 47. Analyses were made on (A) air-dried samples and (B) moisture-free samples and heat determinations were made by the Emerson bomb calorimeter. All the coals are bituminous except the "Canadian anthracite" from Bankhead that United States practice would denominate semi-anthracite, the volatile matter running 9.2 per cent.

UTAH COALS

Name	Origin	Moisture	Fixed Carbon	Volatile Matter	Ash	B.t.u.	No
Aberdeen	Kenilworth	A 2.2	45.6	46.4	5.8	13,259	31
		B	46.7	47.4	5.9	13,558	
Black Hawk, egg	Black Hawk	A 3.70	47.32	44.98	4.0	12,912	2
		B	49.1	46.7	4.2	13,408	
Castle Gate, egg	Castle Gate	A 1.90	47.1	40.4	10.6	11,857	23
		B	48.0	41.2	10.8	12,188	
Hiawatha, egg	Hiawatha	A 3.42	50.97	39.14	6.47	12,924	1
		B	52.8	40.5	6.7	13,382	
King, egg	Mohrland	A 2.6	48.05	42.65	6.7	12,924	13
		B	49.3	43.8	6.9	13,269	
Liberty	Carbon Co.	A 2.3	49.2	42.9	5.6	13,482	17
		B	50.4	43.9	5.7	13,800	
Royal Utah, stove	Castle Gate	A 1.60	46.1	43.3	7.0	13,187	26
		B	48.9	44.0	7.1	13,401	
Royal Utah, steam	Castle Gate	A 1.8	47.05	42.95	8.2	13,067	29
		B	47.9	43.7	8.4	13,306	
Spring Canyon	Storrs	A 2.1	48.7	42.4	6.8	12,852	37
		B	49.7	43.3	7.0	13,128	
Standard	Standardville	A 2.14	47.2	44.06	6.6	12,948	21
		B	48.2	45.1	6.7	13,231	
Sunnyside, egg	Sunnyside	A 1.70	51.9	38.7	7.7	12,996	24
		B	52.8	39.4	7.8	13,220	
Utah Grand	Sego	A 3.2	52.7	38.37	5.7	12,364	16
		B	54.5	39.6	5.9	12,772	
Utah Grand	Sego	A 2.6	38.0	30.4	29.0	9,621	34
		B	39.0	31.2	29.8	9,878	

BRITISH COLUMBIA COALS

Name	Origin	Moisture	Fixed Carbon	Volatile Matter	Ash	B.t.u.	No
Corbin	Corbin	A 1.2	68.45	24.5	5.85	14,097	33
		B	69.3	24.8	5.9	14,262	

ALBERTA COALS

Name	Origin	Moisture	Fixed Carbon	Volatile Matter	Ash	B.t.u.	No.
Bellevue lump	Bellevue	A 1.1	70.26	22.64	6.0	14,611	7
		B	71.0	22.9	6.1	14,772	
Canadian Anthracite	Bankhead	A .6	80.3	9.2	9.9	13,116	3
		B	80.8	9.9	9.9	13,195	
Canadian Free Burning	Lethbridge & Tabor	A 7.0	45.1	38.9	9.0	11,488	8
		B	48.5	41.8	9.7	12,353	
Green Hill, mine run	Blairmore	A 1.0	69.05	23.15	6.8	14,635	4
		B	69.8	23.4	6.8	14,772	
Green Hill, furnace	Blairmore	A 1.4	49.05	42.3	7.25	14,559	11
		B	49.7	42.9	7.4	14,866	
Green Hill, steam	Blairmore	A 0.6	65.15	23.25	11.0	13,451	6
		B	65.54	23.4	11.06	13,534	
Internatl. Coal & Coke Co.	Coleman	A .8	53.3	25.2	20.7	11,847	30
		B	53.7	25.4	20.9	11,943	
McGilvary Creek, mine run	Coleman	A 1.05	60.40	22.25	16.3	13,115	20
		B	61.0	22.5	16.5	13,254	
Spokane & Alberta Coal & Coke Co., Tent Pass Mine	Crows Nest	A .5	59.4	18.8	21.3	11,966	43
		B	59.7	18.9	21.4	12,027	
Tent Pass Mine Vein No. 8.	Crows Nest	A 4.9	58.2	20.35	16.55	10,148	44
		B	61.2	21.4	17.4	10,670	
Taber	Lethbridge	A 8.2	50.7	34.2	6.9	11,297	35
		B	55.2	37.3	7.5	12,306	

WYOMING COALS

Name	Origin	Moisture	Fixed Carbon	Volatile Matter	Ash	B.t.u.	No.
Clean Burn	Sheridan	A 10.7	45.6	38.3	5.4	10,851	15
		B	51.1	42.9	6.0	12,151	
Kemmerer	Kemmerer	A 1.7	47.3	33.3	17.7	11,596	36
		B	48.1	33.9	18.0	11,797	
Kirby	Kirby	A 6.75	51.9	38.6	2.7	11,881	19
		B	55.8	41.3	2.9	12,740	
Owl Creek, lump	Gebo	A 9.0	51.2	36.90	2.9	12,613	5
		B	56.26	40.54	3.2	13,860	
Owl Creek, egg	Gebo	A 9.5	51.7	36.1	2.65	12,505	10
		B	57.2	39.9	2.9	13,818	
Peacock, Rock Springs, nut	Rock Springs	A 3.8	53.8	40.6	1.8	13,140	28
		B	55.9	42.2	1.9	13,659	
Peacock, Rock Springs, steam	Rock Springs	A 3.5	52.0	39.8	4.7	12,623	27
		B	53.9	41.2	4.9	13,080	
Rainbow Rock Springs	Gunn	A 4.6	53.8	40.0	1.6	12,445	38
		B	56.4	41.9	1.7	13,045	
Rainbow, Rock Springs	Gunn	A 6.6	53.2	38.2	2.0	12,066	18
		B	57.0	40.9	2.1	12,940	
Rock Springs, nut	Superior	A 6.3	52.9	38.8	2.0	12,876	9
		B	56.4	41.4	2.2	13,740	
Star, Rock Springs, nut	Rock Springs	A 5.85	50.1	41.85	2.2	11,919	22
		B	53.3	44.4	2.3	12,659	

IDAHO COALS

Name	Origin	Moisture	Fixed Carbon	Volatile Matter	Ash	B.t.u.	No.
Brown Bear	Driggs	A 2.75	53.4	40.3	3.55	13,259	46
		B	54.91	41.44	3.65	13,634	
Horse Shoe	Driggs	A 2.4	53.75	39.8	4.05	13,235	47
		B	55.07	40.78	4.15	13,564	

WASHINGTON COALS

Name	Origin	Moisture	Fixed Carbon	Volatile Matter	Ash	B.t.u.	No.
Cinnabar	Chehalis	A 6.0	52.05	40.1	1.85	11,679	45
		B	55.5	42.7	2.0	12,424	
Queen, egg lump	Cle Elum	A 2.45	48.95	37.5	11.1	12,122	42
		B	50.3	38.4	11.3	12,426	
Roslyn No. 2, mine run	Beekman	A 1.9	41.1	31.5	25.5	10,057	40
		B	41.9	32.2	25.9	10,252	
Roslyn No. 3, washed steam	Beekman	A .8	48.5	34.5	16.2	12,206	41
		B	48.7	34.7	16.3	12,305	
Roslyn Cascade, steam	Roslyn	A 1.90	42.6	35.7	19.8	11,129	25
		B	43.5	36.4	20.1	11,345	

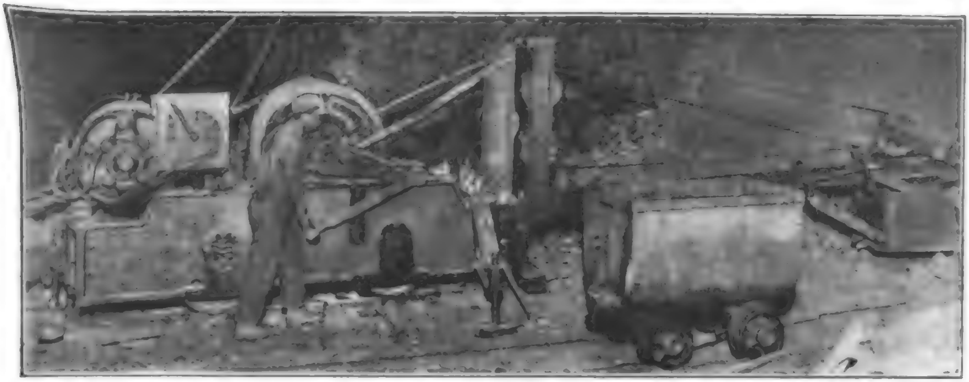
MONTANA COALS

Name	Origin	Moisture	Fixed Carbon	Volatile Matter	Ash	B.t.u.	No.
Bear Creek, slack	Bear Creek	A 5.7	44.8	36.6	12.9	11,230	12
		B	47.5	38.8	13.7	11,909	
Bear Creek	Washoe	A 6.2	47.4	39.0	7.4	11,548	32
		B	50.5	41.6	7.9	12,311	
Roundup	Roundup	A 6.6	53.8	29.0	10.6	11,488	39
		B	57.6	31.1	11.3	12,300	
Smith	Bear Creek	A 7.2	50.51	33.55	8.74	11,320	14
		B	54.5	36.1	9.4	12,198	

THE COMPLETE FIRST-AID TRAINING COURSE of the Bureau of Mines was recently given by Mine Safety Car No. 2 to a considerable number of students of the Colorado Agricultural College at Fort Collins and the University of Colorado at Boulder. In Denver 150 city firemen were trained in first aid. The crew of this car also gave first aid in the oil and lignite fields of Texas during the greater portion of the winter. City firemen in Dallas have recently taken the training.

AT THE EXPERIMENTAL MINE of the U. S. Bureau of Mines at Bruceton, Pa., near Pittsburgh, arrangements are being made for conducting a series of tests to determine data relative to coefficients of friction of air currents in mines and loss of head in the air passing around turns and bends and around various mining areas.

A REPORT ON MINING METHODS in the western Pennsylvania bituminous coal region has been prepared by the U. S. Bureau of Mines, with special relation to the thin-vein district. It is planned to incorporate in the report data on mining methods in the thick-vein district and in the Connellsville region.



. CONWEIGH SHOVEL LOADER, IN WHICH THE DIPPER SLIDES BACK AND FORTH ALONG A BOOM

Costs of Operation of Shoveling Machines in Mines

Records Made in Metal Mines by Several Types of Loaders—Most Loaders in Metal Mines Use Material Gently—Some Are Built for Narrow Work Only—A Light Type for Coal Mines

IF IT IS unfair to compare coal-cutting costs it is still more invidious to compare those of loading. Hugh Archbald has just published a book entitled "The Four-Hour Day in Coal," in which he shows that by inefficient delivery of cars the miner's opportunity to load coal is reduced to four hours or thereabouts per day. This "unemployment in employment" is a matter that demands correction, but it is still more one that should be overcome in the loading of coal by machinery. A machine which loads rapidly and yet is kept back by the equal turn will barely do more than an hour per day. Given a preference it will do better than that, but even with every arrangement favorable it cannot in driving rooms, especially narrow rooms, have anything resembling a full eight-hour run.

The shovel is never any better than the management behind it enables it to be. If cars are not supplied in a steady stream it cannot hope to give a good account of itself. The capacity of our mines is limited by the railroad transportation efficiency, but still more is the capacity of a shovel held down to the opportunities afforded by the car supply at the face of the workings. Given a chance to work equal to that afforded the longwall mining machine, it will readily do a big day's work, for it demands no effort on the part of the man operating it, so that it is not held back in any way by the inertia of the operative, who furthermore has no incentive by reason of fatigue to keep it from doing a full day's work. In fact, barring a certain disposition to keep out machinery for fear that men will be displaced, the employee is without any conceivable excuse for preventing the machine from accomplishing its utmost. The efficient work of shovels in strip pits, where car deliveries are easily arranged, gives an inkling as to the possibilities below ground if cars could only be furnished with equal regularity.

The Bureau of Mines recently published a bulletin by C. Lorimer Colburn on the work of underground shovels in metal mines, entitled "Underground Loading Devices in Metal Mines," Serial 2,300 of "Reports of Investigations." The unbreakableness and size of the material shoveled in metal mines militates against favorable results. So also does the narrowness of the drifts and the smallness of the cars. It is difficult to arrange for a steady passage of wagons when working at the dead end of a narrow drift. Furthermore the shoveling surface in metal mines is not always favorable to easy excavation. On the other hand, the greater weight per cubic foot of the material lifted, the absence of union restrictions and of the union spirit and the closer and more adept superintendence make conditions more favorable. In metal mines, with some exceptions, the roof is bad, much timbering is necessary, and conditions such as obtain in salt mines, where large roof spaces are permissible, cannot be found. However, in some mines working in chert or limestone the roof is unusually strong and will stand over large areas the like of which no coal mine could possibly leave unsupported. Props are not used in these mines and in some few cases immense areas have been left entirely without interior pillars. The Bureau's results, however, are not all for shoveling under any such favorable conditions.

The Hunt rotary shovel,[*] which has revolving buckets the movement of which is regulated by carefully designed cams and which feeds to a conveyor belt, has all the advantages of the continuity that comes from such a design and it also has the quality of being kindly to the coal intrusted to its care. It is quite capable of handling lumpy material without breakage, as the buckets are large enough to tackle big lumps exceeding those that a man can lift. The Bulletin declares that "the management [at the Mayville Iron Mines of the Steel & Tube Co. of America] states that the machine has loaded as many as 116 cars of three-ton capacity in eight hours." That is about 348 tons in a day, or 43½ tons per hour. The report adds that "no records of this machine over a long period of time are available."

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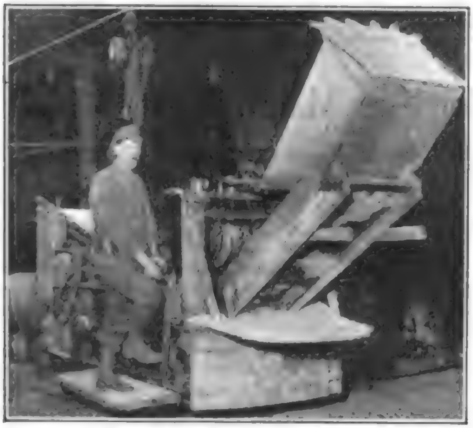
[*] Described in issue of *Coal Age* of May 5, 1921 on p. 789 et seq.

In one mine visited by Mr. Colburn a Myers-Whaley shovel was installed. It had been in use three years. The management stated that during 1918 more than 30,000 tons of material was shoveled at a cost of 20.07c. a ton. This cost was divided between repairs (9c. per ton) and operating labor and supplies (11.07c.). During 1919 nearly 39,000 tons was shoveled at a cost of 19.15c. per ton, and during 1920 nearly 40,000 tons at a cost of 20.69c. per ton.

The tonnage on individual machines varied according to the thickness of the ore body, the amount of ore available and the time required for switching cars. The average was about 100 tons per eight-hour shift but when it was possible to work five or six hours in one or two headings, 130 to 150 tons was loaded. The crew consisted of one operator and one mule driver. The operator would break up boulders while the driver was switching cars.



CONWEIGH DIGGER BELT LOADER

The dipper is hinged to the dipper arm and can be swung on this hinge 90 deg. in a vertical plane. Both the front and back of the dipper are open. The dipper arm is so constructed that it forms a trough through which the material slides from the dipper to the belt conveyor.

In another mine a test was made which was observed by a Bureau of Mines Engineer. The machine had one runner, two helpers and a shoveler in attendance. A locomotive was kept constantly at hand for switching purposes. The machine readily shoveled the four and one-half tons necessary to fill the car in three minutes, after which ten minutes was taken to switch the loaded car about 500 ft. and to replace it with an empty. Over a period of two hours this machine handled cars at the rate of one car for every fifteen minutes, or eighteen tons per hour. A shift's work was about 125 tons.

In another mine the Myers-Whaley machine was used to handle material in a slope. The machine in this mine was compelled to work on a grade of from 5 to 10 per cent. It worked nicely on a 5-per cent grade and with difficulty on one of 10 per cent. The working face was 10 ft. high. During the period that observation was made the machine shoveled 2,653 tons, which was at the rate of 12 tons per hour. The costs were as follows: Shoveling, 20.80c.; drilling, 8.71c.; blasting, 15.39c.; total, 44.9c. per ton. The cost of doing the same work by hand was 58.5c. per ton.

In July, 1918, Witherbee, Sherman & Co. purchased for its Harmony mine one No. 4 type Myers-Whaley shoveling machine. In 1920 three additional machines were installed. The material handled was magnetic iron ore. The wage paid the shovel runner was 57½c. per hour, and that of the helpers 47½c. per hour. Five men ran the machine and handled the cars. The average tramming distance was 250 ft. Table I gives information about these costs.

TABLE I. OPERATING COSTS FOR 1920 AT THE HARMONY MINE

	— During Seven Months —			During Twelve Months
Tonnage	12,459	10,365	9,996	12,387
	Cents	Cents	Cents	Cents
Operating labor cost	12.7	14.8	14.8	19.1
Repairs, labor cost	3.1	5.4	3.0	15.0
Repairs, supply cost	8.7	10.1	9.6	28.0
Shops and miscellaneous	0.4	0.1	0.1	3.8
Power	0.4	0.4	0.4	0.4
	25.2	30.8	27.9	66.3

The higher costs for the last machine are mostly in repairs. This machine was bought in 1918 and was practically rebuilt except for motor and frame.

The Conweigh digger belt loader is a shovel having a method of operation that is by no means rough toward the material handled. The shovel lifts the load which when released slides out of the bucket backward onto a belt conveyor. The dipper can be swung 90 deg. in a vertical plane. A 15-hp. motor provides the power. Standing on a platform at the side the operative can readily see and direct the digging operations.

The machine has been in operation in the mines of the National Lead Co., St. Francois, Mo. The record for the month of February, 1921, was an average of 96 tons of ore loaded in an eight-hour shift with one operator and one helper; 3,360 tons was loaded during the month. These two men not only load the cars but push the empty one-ton capacity cars to the machine and deliver the loaded cars to the motor haulage loop. A labor cost of 9½c. per ton was reported for the February operation. To this should be added the cost of power and repairs. The management expects to reduce its present loading costs of 16.64c. per ton by using this machine.

In some ways the Conweigh shovel loader closely resembles the machine devised for the Locust Mountain Coal Co. by Mr. Brown and described in *Coal Age*, March 3, 1921, p. 395 et seq. It consists of a boom mounted on the forward end of a steel frame. A dipper slides back and forth on the boom, which can be swung to either side or up and down. This machine also is not unsuited for coal loading, as it does not unduly break the material it handles.

The machine is controlled by an operative who stands to the right of the machine. The movement of the dipper and boom is controlled by two levers. The dipper is pulled into the pile of material and after filling itself is raised over a car, which may be placed on a track laid on either side of the machine as desired. As soon as the dipper is over the car the operative pulls a rope and the bottom is tripped, releasing the load.

During 1920, at the St. Louis Smelting & Refining Works of the National Lead Co., St. Francois, Mo., 169,351 tons of ore was loaded by seven of these machines, which made an average of 62.4 tons loaded per shift. The average was 16.64c. per ton. The costs were distributed as follows: Operating labor, 14.9c.; repair labor, 0.30c.; supplies, 0.99c.; power, 0.44c.; total, 16.64c. per ton.

The Shuveloder needs no description, having been used for some time in coal mines for loading rock and bottom clay, falls and the like and in the Bellingham mines of the State of Washington for loading coal also. It has been described in an earlier issue of *Coal Age*.

One man operates the machine and another switches the cars. In some places where digging is quite difficult a third man is used as a helper. At one mine the loader was used intermittently. Working on rock it shoveled 72½ cars of 2¾ tons capacity in 35½ hours, or 5.7 tons per hour, at a cost of 25.09c. per ton. This included tramming the cars 370 ft. The actual time of loading was 16½ hours. The delays were due to tramming, switching, derailment of loader and repairs. In another test, working on soft iron ore, 208 cars were loaded in 139¾ hours at a loading cost of 12.97c. per ton. The actual loading time was 24½ hours.

An Armstrong No. 11 shovel was in use at the Colby mine of the McKinney Steel Co., Bessemer, Mich., to load broken rock in driving drifts. The drifts are 7 ft. high by 8 ft. wide, and the pile of rock is about 19 ft. long and about 4 ft. high at its deepest place. There are about fourteen carloads of 32 cu.ft. capacity to the pile. Two men were used in loading—one operative and one attendant who switched the cars. The machine was observed during the shoveling of one of these piles of material, with the following results:

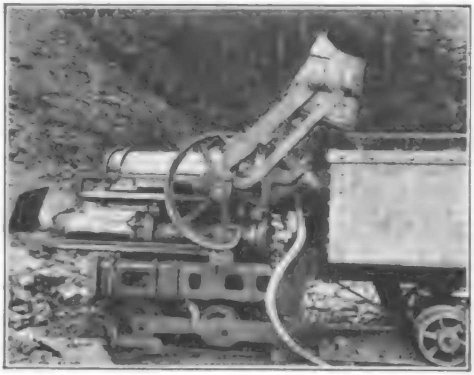
Total time of setting up machine, 10 minutes; time of loading fourteen cars, 58 minutes; 12 move-ups of loader, 30 minutes; switching twelve cars, 92 minutes; total, 190 minutes. Total number of cars loaded, 14; total cubic feet, 448; total number of move-ups, 12; total number of loader dippers, 222. Average number of loader dippers to a car, 16; average number of loader passes per minute, 4; average time for loading cars, including move-ups, 6 minutes; average time for loading one ton of rock, including move-ups, 2.4 minutes. Total time required for setting up the Armstrong shovel, loading and tramming of the rock, broken from an average break of a round of holes took one hour and 45 minutes.

SHOVELS NOW INSTALLED HAVE RIGID BOOM

The Thew shovel when it first entered the coal mines was a top-lofty machine that could be used only in mines like that at Hanna, Wyo., where the deposit was more than 30 ft. thick*. It has been redesigned, as the illustration shows. The capacity is about ¾ cu.yd. The boom is rigid, being built up of steel so as to require the minimum headroom. The operating mechanism consists of a 20-hp. motor and the necessary gears and other mechanical parts to operate the machine. The operating mechanism is mounted on a platform. Below the platform is a turntable which revolves the entire shovel through a full circle of 360 deg. The entire machine is carried on the truck, which is on a caterpillar tractor. The machine is self-propelling.

The operative has a seat on the platform which supports the operating mechanism. From this seat he can observe the action of the dipper and can also keep watch over the performance of the operating mechanism. The different motions of the shovel are controlled by levers. The dipper is forced into the pile of material by a movement imparted to the dipper arm and the pulling of the dipper chains. When the dipper is full the dipper chains are tightened so as to pull the dipper into a vertical position. The shovel is then swung on its turntable until the dipper is over the car. The bottom of the dipper is then tripped, allowing the material to drop. It will be observed that this shovel also will not unduly break the coal.

The Vinegar Hill Zinc Co., Platteville, Wis., has operated Thew electric shovels in its mines in the Oklahoma-Kansas-Missouri district and in the Wisconsin-Illinois district. At the Barr mine, in Kansas, near Picher, Oklahoma, the ore body is mined in stopes from 20 to 45 ft. high by the mining method common to the district, but cars holding 1½ tons instead of ½-ton cars are used, and accordingly the shaft is equipped with cages. A type O Thew shovel was installed in April, 1919. This is a standard type, revolving in the full circle, and is self-propelled, mounted on a 4-wheel truck. It was found to be more flexible than other loaders then being tried in the district, because the full-circle swing allows ore to be loaded at any point—front, back or to either side—within the radius of the boom. Three dipper loads fill a 1½-ton car. Over a period of twenty weeks' operation the average loading per eight-hour shift was 160 tons at about one-half the cost of hand shoveling.


SHUVELODER LOADING FROM A STOCKPILE

At many collieries these machines are loading bottom and brushed rock, rock falls and coal. They have four cylinders, all operated by compressed air. The machines are propelled by hand. Immediately above the truck and beneath the main body is a turntable that provides a swiveling movement. The headroom required is 82 in. The machine will load any car 50 in. high or less.

At the Meloy mine, New Diggings, Wis., two type O Thew shovels have been installed. The shovels, like that at the Barr mine, are electrically driven and self-propelled and are mounted on wheels. The headroom required is a minimum of 16 ft. and the operating width needed is at least 20 ft. The stopes are 50 ft. by 25 ft. wide, providing both ample working space and sufficient broken ore so as to insure that the shovel may be kept in continuous operation. Dippers of both ⅝ cu.yd. and ¾ cu.yd. are used. The machines weigh about 15 tons, but can be readily disassembled so as to lower through a 6 x 6 ft. shaft compartment.

A crew consists of one operative, who should be a careful and experienced man; one helper, unskilled; and one mule driver and mule, handling 1½-ton cars. Such a crew, under suitable conditions, should easily load 175 to 230 tons per 9-hour shift. Table II shows the operating record for the period between Nov. 24, 1917, and Aug. 16, 1919, for one of the shovels at the Meloy mine.

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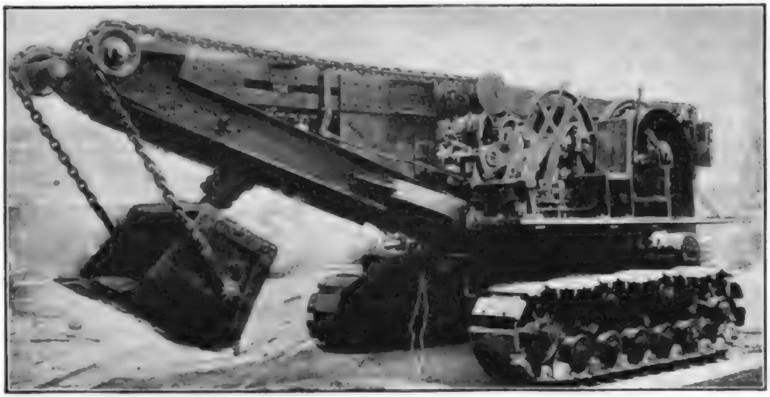
*Coal Age, Dec. 5, 1918, p. 1018; as shown on p. 1016 of the same issue a shovel had been constructed of smaller dimensions.



Thew Underground Shovel

This excavating shovel has learned to crawl since it went underground, as we all do soon after entering coal mines. It is operated by electricity. Its bucket will hold ¾ cu.yd. and its motor is a 20-hp. machine. The shovel can be revolved 360 deg. on a turntable placed below the platform.

TABLE II. SHOVEL OUTPUT AT MELOY MINE

Total shoveled, tons	27,177
Total shifts worked	211
Average working time per shift, hours	3.85
Average tons shoveled per hour	33.4
Average tons shoveled per shift	129.3
Cost per Ton	Cents
Labor	11.06
Power	0.70
Repairs	1.09
Total, cents	12.85

Note—The cost of hand shoveling during the same period was approximately 23c. per ton. In both instances the tramming to the main haulage loop is included in the cost.

A two-months' operating record for two shovels at the same mine in January and February, 1921, is given in Table III.

Five Thew shovels were purchased by Witherbee Sherman & Co. The first shovel was purchased in September, 1917; two were purchased in 1918, and two in April, 1919. Three of these shovels were put into operation at their Harmony mine. In Table IV is given the record of these three shovels for the year 1920.

The ore was hauled away from the shovel in 54-cu.ft. gable-bottom cars. The Thew shovel in No. 2 stope worked against a 40-ft. face. The vein at this point was 60 ft. wide. Tracks were laid on either side of the shovel. The shovel loaded the car on one track and then filled that on the other while the first car was being trammed to the shaft and emptied. It took four minutes to dump the car and return it to the shovel. The shovel had difficulty in picking up large lumps and scraping the bed rock.

A Thew shovel is working in one of the large stopes in the Mascot mine of the American Zinc Co., at Mascot, Tenn., where the ore is a sphalerite and occurs in limestone. The mine has an open stope about 200 ft. high. The ore is loaded into steel cars of about two-ton capacity and hauled by mules to a side track, from which place the cars are taken to the shaft bottom by electric storage-battery locomotives. The stopes are quite large, so that there is plenty of room for the machine to operate. This shovel was put in operation in August, 1920, and in the succeeding three months handled 6,335 tons of ore at a cost of 17.55c. per ton.

TABLE III. RECORDS OF TWO SHOVELS AT MELOY MINE

	Total Tons Shoveled	Total Shifts Worked	Hours per Shift	Labor Cost per Ton	Power Cost per Ton	Repair Cost per Ton	Total Cost per Ton
Shovel No. 1	10,987	80	7	11.7c.	1.3c.	0.7c.	13.7c.
Shovel No. 2	5,917	42	7	11.4c.	1.3c.	0.7c.	13.4c.

Note—The cost of hand shoveling during the same period was approximately 18c. per ton. In all cases the cost of tramming 200 ft. to the shaft was included in the labor cost.

In 1918 the Chateaugay Ore & Iron Co., of Lyon Mountain, N. Y., introduced a Thew shovel into its No. 4 mine. Records of performance, cost and upkeep were not kept. Another shovel of the same make was procured for the No. 5 mine, but was used very little and was later transferred (March, 1919) to the No. 1 mine. Labor costs for the Thew shovel in No. 1 mine are: One operative, $5.25; one operative's helper, $4; three trammers, at $4 each, $12; total, $21.25.

Two hundred tons of ore was handled per shift, making a cost for labor of 10.62c. per ton. This shovel worked in a large stope 40 ft. wide and 45 ft. high. Cars were pulled in and drawn out by mule. A switch was arranged 100 ft. from the shovel, and the cars pushed up to the shovel by hand for this distance. Side-dump cars of 40-cu.ft. capacity were used; they hold 2½ tons. Much time was lost in switching cars.

TABLE IV. RECORDS OF THREE SHOVELS IN HARMONY MINE

	Thew No. 1	Thew No. 2	Thew No. 3
Tonnage	23,398	26,134	27,720
Distance trammed	158	210	395
	Cost, Cents per Ton		
Operating, labor cost	16.2	14.9	16.0
Moving, labor cost	01.2	00.3	00.7
Repairs, labor cost	06.6	02.1	02.6
Repairs, supply cost	10.0	05.2	07.0
Shops and miscellaneous	04.1	01.6	01.9
Power	00.4	00.4	00.4
Total cost	38.5	24.5	28.6

At the No. 4 mine also a Thew shovel was in operation. This shovel handles 300 tons per day, at a cost for labor of 6c. per ton. A tail rope is used for switching cars. Two tracks lead to the shovel, so that one car is being loaded while another car is being pushed in. The shovel operated almost continuously. The full haul for cars is 600 ft. Alternating current at 220 volts was used. Power cost about 2½c. per kw.-hr., or about $1 per day per shovel. The shovel was often out of commission on account of repairs. The most serious trouble experienced was the breaking of an I-beam on the No. 1 shovel. The rawhide pinions soon wear out, the average life being about three weeks. It is estimated by this company that the cost to handle ore by hand was 35c. per ton in the No. 1 mine, and in the No. 4 mine

44c. per ton. Labor and supplies consumed in repairs added in general about 5 or 6c. per ton to the mining cost.

The St. Joseph Lead Co., of Bonne Terre, Mo., operates six Thew shovels at its mines. The stopes are large, giving ample room for operation. All of these machines were put in operation in 1920. The record of their performance is as follows: Thew No. 1 loaded 8,713 tons at a cost of 14.98c. per ton. Thew No. 2 loaded 26,970 tons at a cost of 18½c. per ton; Thew No. 3 loaded 12,194 tons at a cost of 18.8c. per ton; Thew No. 4 loaded 20,917 tons at a cost of 16.65c. per ton; Thew No. 5 loaded 4,969 tons at a cost of 29.34c. per ton; Thew No. 6 loaded 4,881 tons at a cost of 28.13c. per ton.

The higher costs for shovels Nos. 5 and 6 are due to their being used in mines where conditions are less favorable for their operation, the stopes being smaller and the operation of the machine being frequently interrupted. The average for all six shovels is 78,644 tons loaded at a cost of 19.96c. per ton. These costs are distributed as follows: Operating labor, 11.025c.; repair labor, 4.115c.; material, 2.895c.; power, 0.933c. per ton.

Although the Marion shovel is not manufactured primarily for underground use, the smaller-sized machine has been used underground by several mining companies. The American Zinc Co. installed one in August, 1920, in its mines at Mascot, Tenn. Records of performance for three months are as follows: Total ore handled, 8,997 tons; cost, 19.7c. per ton. Labor costs were 17.60c. and repairs 2.11c. As this was a second-hand shovel, the repairs were a little higher than usual.

A Marion shovel with ¾-yard dipper is in use at the 1,650-ft. level of the United Verde Mine at Jerome, Ariz. The cost of loading ore into chutes with this shovel is estimated as being less than for doing the same work by hand. The great weight of the machine makes it expensive to move in or out of a stope and because of its large capacity it often has to be kept idle, waiting for ore. The advantage of the machine is that it loads material faster than it could be done by hand.

AIR SHOVEL FOR USE IN NARROW QUARTERS

The Hoar underground shovel uses a dipper and is operated by compressed air, three sets of air engines being necessary to control the various movements. These air engines are located in the body of the machine. A turntable which enables the machine to be swung through a complete circle is located between the body and truck. The truck runs on the ordinary mine track. The standard size machine requires an operating space 7 ft. wide by 6 ft. high. Its weight is 5,800 lb.; air pressure required, 90 lb.; air connections, 1½ in.

The Hoar underground loader is not self-propelling and therefore must be pushed to its working place. It is then clamped to the rails. Having a full-circle swing, the machine can load cars to either side or to the rear. The operative has a seat on the small platform on the left-hand side of the body of the machine. Being well above it he can observe the movement of the dipper. The machine is controlled by three levers which are placed conveniently for his operation.

In digging, the dipper is forced into the pile of material by the forward motion which the engine gives to the dipper arm. At the same time another engine winds the cable onto the drum, which, acting as the lever, forces the dipper up through the pile. As soon as the dipper is raised free of the pile of material the entire machine is revolved on the turntable until the dipper is brought over the top of the car; then the bottom of the dipper is tripped, allowing the material to fall.

The Hoar underground shovel has been introduced into only a few mining districts, the manufacturers having found a ready market in the Lake Superior iron mining district for their entire output. Little effort has been made to introduce the machine in other regions. It is being used in drifts, subleveling work, stoping, to clear out sumps, and also on the surface to shovel coal from the coal piles for use in boilers. The cost of operation varies considerably, depending upon the conditions, the range being from 17c. to $1.08 per ton.

In shoveling the well-broken material in places where there was plenty of room, an average of 135 tons was loaded in 24 hours at a cost of 17.9c. The wages of the attendants were: Operative, $5 per day; helper, $4.75 per day. In another place, where the material was wet and sticky and contained many large lumps, the machine loaded over 8,500 tons in two months at a cost of $1.08 per ton. The mine management estimated that to have done the same work by hand would have cost $1.60 per ton. The wages of the attendants were: Operative, $8, and assistant, $6 per day. In the case of sublevel stoping, the machine handled more than 1,700 tons of material in one month at a cost of 65c. per ton.

In the latter part of 1920 a Hoar underground shovel was put in operation at the Montreal iron mine. At the same time similar work was being done by hand, so that it is possible to compare the costs by the two methods. Comparison can be made between the work done on the 23d and 24th levels, the driving being done in the hanging wall in both instances. The type of ground was practically the same and the other conditions also were fairly equal. The 23d level drift was extended, using hand loading alone. The cost for labor was $12 per foot, over a period of 7 months, and during

HOAR UNDERGROUND SHOVEL FOR NARROW PLACES

This operates by compressed air, three engines controlling the various movements. A turntable is located between the body and the track. Thus it can be swung in a complete circle. It can be operated in a space 7 ft. wide by 6 ft. high and weighs 5,800 lb. It works on 90 lb. air pressure, using a 1½-in. air connection.

this time the drift was advanced 469 ft., or at the rate of 67 ft. per month.

In the 24th level east drift, the Hoar underground shovel was used and the drift was advanced 270 ft. in 3 months, or at an average of 90 ft. per month. The labor cost amounted to $6.62 per foot and the repair and supply cost was $1.24 per foot, making a total of $7.86 per foot. At the same time the shovel was used to handle material on the 24th level west at a labor cost of $6.21 per foot and supply and repair costs of $1.24 per foot, making a total of $7.45 per foot. The saving in the east drift of the 24th level was $4.14 per foot and the saving in handling the material from the 24th level was $4.56 per foot.

TABLE V. COMPARISON OF HAND AND MACHINE LABOR, MONTREAL MINE

	Hand Labor	No. 2 Hoar Loading Machine
Location	23d level	24th level
Material	Iron ore	Iron ore
Size drift	10 x 10 ft.	10 x 10 ft.
Time of test	7 months	3 months
Total footage	469 ft.	270 ft.
Total tonnage	3,906 tons	2,250 tons
Monthly footage	67 ft.	90 ft.
Monthly tonnage	558	750

The Keystone Driller Co. has for several years manufactured and placed on the market an excavator mostly used on road work and also in digging cellars and ditches. This machine consists of an upright boiler with an engine mounted on a tractor, and a dipper operating on a boom. The Federal Lead Co. purchased several of these machines and remodeled them to be used in their mine at Flat River, Mo. In order to adapt the Keystone to underground mining it was necessary to replace the boiler and engine by an electric motor.

The operation of the machine as adapted by the Federal Lead Co., Flat River, Mo., is as follows: The operative stands on the main platform, where the movements of the dipper can be observed. By levers, the boom can be lowered and the dipper pulled into the pile of material by a cable operating over the pulley at the end of the boom. The boom can be lowered, raised or swung by the second cable. As soon as the dipper is filled the boom is raised and swung until the dipper is brought immediately above the car. The bottom is then tripped, allowing the material to discharge into the car. The machine is given stability by two braces on either side of the machine at the front.

LOADED THREE-QUARTER MILLION TONS AT 18C.

During the year 1917 in mine No. 12 48,917 tons of ore was shoveled by the Keystone shovel at a cost of 18.24c. per ton. In 1919 in mine No. 1 8,313 tons was shoveled at a cost of 19.11c. per ton and in the same year in mine No. 12 318,819 tons was shoveled at a cost of 16.4c. per ton. In 1920 370,373 tons was shoveled at a cost of 19.03c. per ton. This makes a total of 746,000 tons of ore thus shoveled, giving an average cost of 17.85c. per ton. The distribution of these costs is as follows: Tons of ore per shovel shift, 126.1; supplies and repairs, 2.10c. per ton; maintenance labor, 12.57c. per ton; power, 1.35c. per ton; total, 17.85c. per ton (sic).

The Golden Rod Mining Co. at Tar River, Okla., used a ¾-cu.yd. Keystone shovel for loading ore. The shovel was operated for 3 or 4 months in 1918. The boiler was connected up as an air receiver, and the engine was run by compressed air. The ore was from 30 to 50 ft. thick. In this work the shovel did not prove satisfactory. It was mounted on a truck and was difficult to move around. The main reason for its failure was the necessity of emptying the dipper into 1,000-lb. cans; a large portion of the material was always spilled and had to be shoveled by hand.

For the records given in this article full credit should be given to Mr. Colburn's brief, which should be consulted in its entirety by those who are interested in this subject. The comment, however, on these shovels has another source, for the most part, especially the reference to coal-mining conditions underground. The bulletin gives valuable data also regarding the use of scrapers in metal mines, where such machinery has long been in successful use. Unfortunately the labor costs in the bulletin are mostly in dollars and cents and not in labor units, which would be more readily translatable. As wages have varied they are not even comparable as between the various years' experience in the same mine. As interest, depreciation and obsolescence are omitted, the figures are likely to be misleading. These items often spell the difference between acceptance and rejection. In some cases, however, repairs which should have been covered by earlier depreciation allowances have caused costs to be unduly high.

RECIPROCATING VS. ROTARY CAR FEED TO SHOVEL

There is little question but what the machinery described in the bulletin should find general use in coal mines where the conditions are not so difficult as to make the machines unavailable. In fact many of them are doing excellent work in coal mines already. The factors militating against their use are the difficulties with labor and the lack of sufficient and efficient superintendence. To a machine having large capacity a continuous supply of cars must be afforded. The heavier and more expensive the machine, the more need for such attention; otherwise the overhead costs will decrease the profit materially. In fact so important is this feature that manufacturers having in mind the multiplicity of narrow workings and the almost inevitable irregularity of car supply are providing units of small size and of less efficiency, which they feel assured will suit the needs of the coal industry better than larger machines of greater capacity but also of greater cost.

The Jeffrey mine-car loader is designed on the principle that when the car movement is reciprocating and not rotary (if these terms may be excused) it never can be really satisfactory. Where cars must be brought to the loader and backed away after being filled, delays are inevitable. Only when trips can be steadily passed by the working face and taken out another way can a car be presented to the shovel for loading as soon as the previous car is filled.

SIMPLE VS. INTER-RELATED SHOVEL EFFICIENCY

Hence, it is argued that as delays are inevitable it is well not to tie up too much money in a shovel, even if by having a less efficient machine the time of loading is somewhat increased. Suppose one shovel can load a car in two minutes and has to wait ten minutes for another, its actual capacity is only one car in twelve minutes. If then another takes ten minutes to load a car and then has to wait a further ten minutes before loading the next, its actual capacity is one car in twenty minutes.

Thus though the first shovel appears to have five times the capacity of the other, the actual capacity is not five times but only 66 per cent greater. When the car delays are longer, and they always are likely to be, then the percentage of relative capacity will fall still lower. Only ideal conditions will enable cars to be presented so fast that the delay between cars will not exceed ten minutes. The time taken in moving the shovel from one working place to another will still further diminish capacity. It is this which has made the large-capacity shovel less effectual than at first sight it would appear to be. The large first cost which adds so much to the expense of operation and the idle time which seems inevitable under present operating conditions add to the argument against such shovels.

Loaders therefore that are not shovels but mere loaders which themselves have to be loaded, but being loaded will raise the coal, transfer it and drop it into the car, seem to have a reason for being which their lower speed of operation and their imperfect service would seem to deny them. They also are more flexible and can be used where the roof is not particularly good and the coal is thin. Consequently this machine, which is loaded by hand shoveling, is rated at 50 to 60 tons a day under actual working conditions in rooms and each machine is intended to get its output from two working places only. The handling of the cars should be carefully planned that tracklaying, timbering and the like is not done by the loading crew.

The Service Coal Mining Co., at Fordham, Pa., made the record in Table VI with a mine-car loader of the type mentioned, between Aug. 16 and Sept. 1, 1921, in the Lower Freeport seam which ran from 46 to 54 in. thick. The mine worked 11½ days. Two men operated the machine and one motorman provided cars.

TABLE VI. TONNAGE LOADED AT SERVICE COAL MINING CO.'S MINE

Work Performed		Cost	
Cars loaded	416	Two men loading, $7.50 per day	$15.00
Coal per car	2,800 lb.	One motorman, $7.50 per day	7.50
Total tons	582	Total	$22.50
Average tons per day	50.6	Cost per ton for loading and shifting	45c.

The daily reports are given in Table VII. They show that much time was wasted waiting for cars. The coal was loaded from headings which made many more moves per day necessary than would be required if the coal had been obtained from rooms.

TABLE VII. SAMPLE DAILY REPORTS OF COAL LOADING AT SERVICE COAL MINING CO.'S MINE

Number of cars loaded	37
Five moves	1 hour 30 min.
Two wrecks of loaded cars	1 hour
Total time loading and changing cars	5 hours

Number of cars loaded	40
Five moves	1 hour 20 min.
Splicing cable	30 min.
Total time loading and changing cars	5 hours 40 min.
Cleaned up four headings and one room.	

Number of cars loaded	16
Waiting for power	1 hour
Arrived at face, 8:30 a.m.; left at 11:45 a.m.	
Total time loading and changing cars	3 hours 15 min.
Working force	One man and motorman
Pump broke down at boiler house making suspension necessary.	

Number of cars loaded	35
Six moves	1 hour 10 min.
Waiting for cars	40 min.
Arrived at face	8:20 a.m.
Total time loading and changing cars	4 hours 50 min.

Number of cars loaded	44
Waiting for cars	40 min.
Arrived at face	8:40 a.m.
Total time loading and changing cars	5 hours
Loaded ten cars out of one room in 1 hr. and 8 min.	

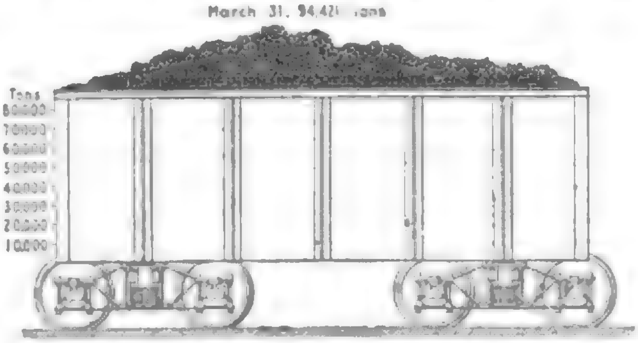
It will be seen that this record might have been bettered had conditions been a little more favorable—for instance, had fewer moves been necessary, the tracks been such as to reduce accidents, the power been steadily available and the runs been longer.

Getting Up Enthusiasm to Break a Record

BACK in February the officials of the Weston Colliery of the Locust Mountain Coal Co. began making preparations to get out all the coal possible during the month of March. The previous record for this operation for one month was 61,146 tons, but it was believed that 85,000 tons could be prepared. Accordingly this was set as the goal to be sought.

Such a tonnage, however, could not be attained except through the enthusiastic co-operation of all concerned. In order to obtain this and arouse the interest of everybody, the following plan was adopted. Each foreman and subforeman was furnished with a chart similar to that shown in the accompanying illustration. This is supposed to represent a railroad car having a capacity of 85,000 tons, and the idea was that the colliery should fill it during March.

Each day the foremen marked on the car the amount of coal mined. Each half hour also announcement was made of the amount of coal dumped during the previous 30 minutes. This resulted in everyone from the general superintendent down to the smallest trapper boy taking an intense interest in the production. When dumping was slow even the picker boys would start yelling for more coal.



VISUALIZING PROGRESS INCREASES EFFORTS

Weston Colliery decided to load 85,000 tons in a month, 24,000 tons over previous records. On a chart such as that above the foremen recorded the coal loaded each day. With such an objective clearly in everyone's mind the output was exceeded by nearly 10,000 tons.

A spirit of co-operation was thus engendered throughout the entire colliery force and each employee strove to do his best. As a result not only was the "car" filled but 9,421 tons was added as "topping." This brought the month's production to 94,421 tons, or 33,275 tons above the previous monthly record. This increase amounted to over 50 per cent, and on the whole was considered entirely satisfactory.

CONFERENCES HAVE BEEN HELD at the Alaska experiment station of the Bureau of Mines, at Fairbanks, with miners and prospectors in regard to the mining possibilities of the Kantishna and Copper Mountain districts. Local interest in the use of lignite from the Nenana field continues. The heating plant at the Fairbanks station, especially designed for this fuel, has proven eminently satisfactory, and the conversion of the public-school heating plant from wood to lignite is being discussed.

TEST RUNS HAVE BEEN MADE by J. D. Davis and J. F. Byrne at the Pittsburgh (Pa.) experiment station of the U. S. Bureau of Mines to determine the relative tendencies to spontaneous combustion of different parts of the Freeport coal seam, the critical temperatures being 185, 190 and 207 deg. C. The coal below the floor is very rich in anthraxylon and runs 4.4 per cent sulphur, of which 3 per cent is pyrite and marcasite.

Savings That Can Be Effected by Tight Boiler Settings, Proper Baffles and Reductions in Furnace Repairs

Suggestions for Rapid and Enduring Furnace Renewals—Radiation from Furnace Walls Should Be Prevented—Fireclay vs. Refractory Cement—Tight Baffles Increase Availability of Heating Surface—Air Leaks Lower Temperature of Flue Gases

By Alphonse F. Brosky[*]
Pittsburgh, Pa.

WHERE a mine generates its own power many are the troubles arising in the boiler room, the place from which all operating energy is derived. Such a mine may be said to be no better than its boiler room, and the superintendent no more successful than his furnace equipment will allow him to be. In fact what has made many operators purchase power or, at least, has reconciled them to its purchase has been the difficulties encountered in boiler operation, largely arising from the inefficiencies and inadequacy of their boiler and furnace equipment.

Many of these faults may be cured by sealing air leaks, by reducing radiation from the furnace walls, by increasing the duty of boilers, while decreasing the frequency with which the furnace is laid off for repairs. The first inclination when a boiler plant is found inadequate is to increase the number of units. By attaining or by exceeding the boiler rating and by using materials that will make the need for repairs less frequent, however, the purchase of additional units, in many cases at least, may be rendered unnecessary. By avoiding the installation of the additional boiler equipment the interest and depreciation or obsolescence charges are not increased and as in making the changes economies are attained in the use of fuel, a reduction also is made in the cost of operation.

With Greater Heat Better Furnaces Needed

One of the major difficulties in furnace building and maintenance is the inability of firebrick and its bonding material to resist the high temperatures and expansional stresses to which it is subjected. Yet the troubles with the inferior refractories, too often in use, would be more frequent were mine boiler plants forced to high capacities. As the peak load and consequent furnace temperature rises higher and higher, the life of the low-grade refractory is proportionately shortened. It is not unusual to hear of a plant running its boilers at 250-per cent rating. When such service is demanded something is bound to fail if the brick and other material in which the boiler is set is not of a highly refractory character.

Heavy production periods make runs beyond the boiler rating profitable, but unfortunately the course which makes the increase in power possible not infrequently causes rapid deterioration of the setting. The intense heat melts, or at least softens the brick, and sooner or later units thus affected must be taken off the line, possibly when they are most needed. The solution of this problem lies in the use of better refractories, employing these materials how and where they are needed and making designs suited to their use. In the long run it is much cheaper to use a good refractory than an inferior one, and many concerns will supply brick that will suit any demand.

It must be borne in mind that the softening temperature of the refractory purchased should exceed the temperature to which the material is likely to be exposed. The melting point alone should not be the guide in choosing a fire-resisting material. Before the refractory reaches its melting temperature it enters into the plastic state. That temperature may be some hundreds of degrees lower than the melting point, and when it is reached, the plastic material may be deformed by stress.

Of course, brick may be ruptured by stresses when cold but the principal failure of firebrick arches is from deformation under the combined influences of heat and stress. Furnace walls usually fail through rupture due to continual expansion and contraction aided by load stresses, or through the deterioration of the materials of which the brick are made. It is needless to say that where extreme heat is to be encountered only the best brick should be selected.

After the choice of firebrick the next problem is to decide upon the bonding material to be used. One of the most important factors in prolonging the life of any refractory is the attention which is paid to joints. A theoretically perfect furnace lining would be one with no joints whatever. To this end in some European countries the bricks are ground to fit snugly and are laid up dry, but the cost of providing for such a tight fit is so high that it has found no imitators in this country. Almost as good results may be obtained by joining the bricks with a thin filler of fireclay or, preferably, with a high quality of refractory cement.

If fireclay is used it should be of a quality at least equal to that of the brick. It would be incongruous to use second-quality fire clay for laying first-quality brick. Where the heat to which the brick is to be exposed is moderate, fireclay can be advantageously employed. The

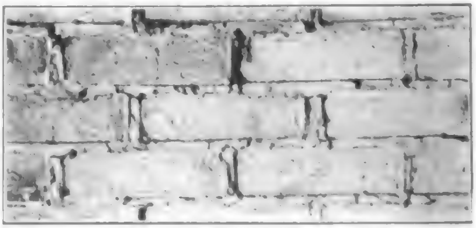


FIG. 1. BOILER WALL, BRICKS SET IN FIRECLAY

Note how the clay has disintegrated, cracked and fallen away, leaving the edges of the brick exposed to the flames, ready to be fused. Thus exposed the faces are sure eventually to succumb to the high temperatures.

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[*] Bituminous editor, *Coal Age*

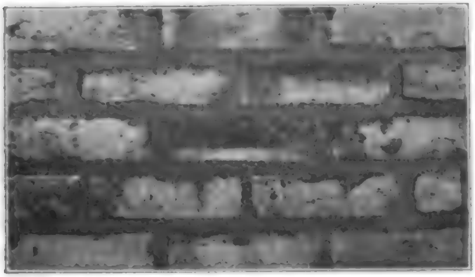

FIG. 2. BRICK SET WITH REFRACTORY CEMENT

Here the edges are protected and the flames cannot lick the edges of the brick and start their destructive work. The joints are the weak places in brick set up with fireclay.

use of a good quality of clay properly applied (avoiding any excess and laying a tight brick-to-brick joint) is helpful in attaining greater furnace efficiency. After all, a fire arch is no stronger than its joints. If it is incorrectly laid and if a poor quality of jointing material is used which melts and runs, the furnace will settle, crack and finally be destroyed. Open joints make the lining susceptible to destructive action, for they increase the area exposed to the heat. Because of its shrinkage and its inability to bond tightly fireclay has been displaced to a great extent by cements.

Several cements are now available which resist fire more satisfactorily than fireclay. The first cost of these is higher, but the ultimate cost is less than that of the jointing material they replace. A good cement will not fuse within the range of temperature of the boiler furnace. At all heats it maintains an exceptionally strong bond. In consequence the deterioration of the boiler lining is even.

Prior to the introduction of these cements the life of the furnace was limited by that of the bonding material used. When the proper cement is employed the life of the furnace is determined by that of the brick. If after laying, a thin cement wash is applied to the surface of the lining, the life of the firebrick is lengthened. Such a coating prevents clinkers and slag from securing as tenacious a hold on the furnace as they would if the surface were of brick. Where the slag forms on the brick itself it adheres so tightly that when broken away portions of the brick not infrequently come with it.

A heat-resisting cement called "thermolith" is furnished by the Harbison-Walker Co. The base of this refractory is a chrome ore. Under ordinary atmospheric conditions it sets upon drying and retains its strength and durability even at temperatures beyond those which boiler furnaces are likely to attain. After the setting and the boiler connections are completed, the brickwork should be dried out thoroughly, first by opening the damper and ashpit doors and allowing the air to circulate freely through the furnace, and next by a light fire which is slowly increased in intensity. The cement and brick can be safely dried in this manner and the cement properly seasoned.

Several grades of cement, each suited to different degrees of heat, are prepared by the Celite Products Co. When these are heated they harden and adhere to the brick.

To keep the furnace from radiating heat from the side and end walls, and thereby to conserve fuel, insulation may be used in the walls of boiler settings. Approximately 4 per cent of the total heat generated in a boiler furnace may be lost by conduction through the walls of the setting. This loss may be lowered to 1½ per cent by interposing an insulating brick such as the Celite Sil-O-Cel between the firebrick and the exterior walls.

A refractory cement which vitrifies at 1,450 deg. F. and withstands temperatures up to 3,100 deg. is made by the Johns-Manville Co. It endures expansion and contraction stresses without disintegrating or crumbling. At furnace temperatures it is sufficiently resilient to allow for the difference between its coefficient of expansion and that of the brick. See Figs. 1 and 2.

This product is said to have another useful application. Where boilers are hard pushed, holes are often burned through the arches. For quick repairs in this emergency a wooden form is built under the holes in the arch, and these are filled with cement. A slow fire is started under the arch, which burns out the form. The cement vitrifies in place and will hold as long as the arch stands. By this means the boiler is off the line for but a short time. Holes up to 2 ft. in diameter have been satisfactorily plugged in this manner.

The Lehigh & Wilkes-Barre Coal Co. often blows a boiler down on Saturday afternoon, draws the fire and plasters up the side walls of the boiler along the fire line with this material. By Sunday morning the furnace is ready and fires can be started for the raising of steam. This saves tearing out the old firebrick and replacing it with new, which possibly would hold the boiler off the line for several days. Such a repair is not only lower in cost but more rapid than one where the fused or deformed brick are replaced.

IMPORTANCE OF PROVIDING TIGHT BAFFLES

Tight baffles are indispensable to the attainment of maximum efficiency with water-tube boilers. By their use more heat can be abstracted from the gases as they move through the various boiler passes to the flue. Their main purpose is to cause the heated gases to sweep over a maximum area of tube surface and to guide them so that they impinge upon the tubes in the most effective manner. When there are no baffles or when the baffles are imperfect and leaky the gases naturally take the path of least resistance and short-circuit to the stack. Where tiles are used for cross-baffling they are sprung into place between the tubes, and it is practically impossible to keep the joints between them tight because the unequal expansion and contraction of the tubes force the joints apart. The tile blocks thus work loose and if they become broken, fall out. Inclined cross baffle walls of tile are even more difficult to maintain.

For this reason monolithic baffle walls composed of cement, cast in forms, are advantageous. They are

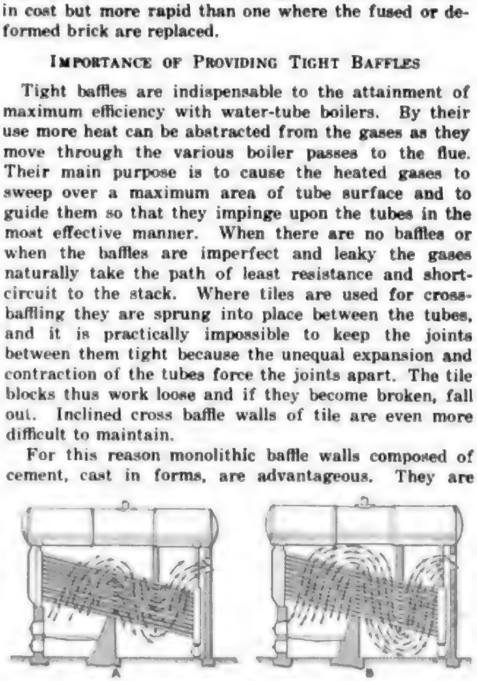

FIG. 3. BOILER WITH DEFECTIVE BAFFLES

In the first some of the heated gases take a short course and therefore part of the available heat goes up the stack. In the second every portion of the heated gas has to pass three times over the tubes and all the absorbable heat is taken up by the water.

more durable and efficient and will not readily break away. The Johns-Manville Co., Inc., recommends a 4-in. wall. The wooden forms may set vertically or slightly inclined, as desired. The high temperature cement is mixed to the proper consistency, poured and tamped. After it is partly dried a fire is started, and the wooden forms are burned out.

A different construction is recommended by the Betson Plastic Fire Brick Co. On one side of the baffle an ordinary cast-iron baffle plate is placed. This serves as one side of a form for retaining the cement. On the other side wooden slats are latticed between the tubes at a distance from the plate equal to the intended thickness of the baffle wall. Then to fill the space plastic material is poked down diagonally between the tubes.

The furnace should be fired up before the monolithic baffle wall has completely set, so that it can give somewhat. By the time the boiler furnace has acquired a capacity temperature the baffle wall has set solid, hugging the tubes. In this way internal stresses are avoided. Like other refractories this plaster is less able to withstand strain at high than at low temperatures, consequently an excellent point is gained by arranging for an absence of strain when the furnace is at its maximum heat. When the temperature decreases, the strength of the baffle wall increases. Thus, despite the difference in the coefficients of expansion of the tubes and the cement, neither rupture nor distortion occurs. The walls fit snugly around the tubes even at the lower temperatures.

FACING THE FURNACE WITH REFRACTORY CEMENT

Not only can Betson plastic firebrick be used for the construction of baffle walls but it can be introduced to replace firebrick at any point in the furnace. It is claimed that its coefficient of expansion is equal to that of brick. The lining is laid as a monolith, and so there are no joints where disintegration can occur. The material is pounded into place with a mallet and then troweled. It is not applied as a thin plaster but in such quantity that the layer is equal in thickness to a brick course. After laying, the lining is subjected to a low fire for a few hours to draw the moisture; the furnace may then be fired as usual. The merits claimed for this refractory are that it is more permanent than firebrick arches and that there are no seams to weaken the walls, that it is unusually well suited for use with overhanging baffles, that it is easily applied and that the material can be used successfully for the quick repair of furnace linings. In Figs. 4 and 5 may be seen walls of this material in process of erection.

These are some of the many ways in which savings can be made in the boiler house. Where the old-type tile baffles are used, a change to more modern construction would lower upkeep costs by reducing interruptions for repairs, lessening supervision and assuring greater efficiency. Many of these recommendations are not available with boilers of the older types, and such equipment should certainly be replaced if used for any other purpose than as standbys. During the present shutdown the opportunity for such replacement is offered and it should not be neglected. No economy is more expensive than retaining antiquated equipment, which will indeed raise steam, but at great expense in coal, labor, maintenance and lost operating time.

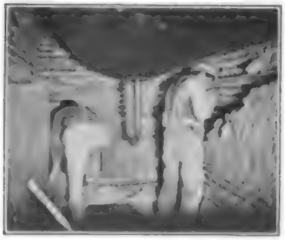

FIG. 4. PLASTERING WALLS

One man is plastering a side wall and one the back wall. The plaster is pounded into all holes.

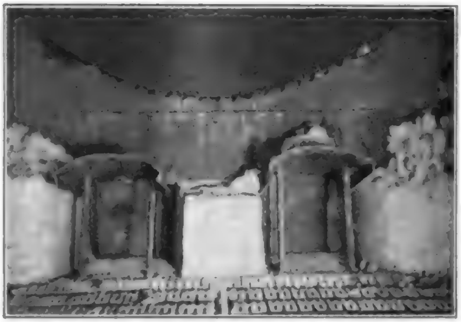

FIG. 5. PLASTERING FRONT WALL OF BOILER WITH PLASTIC "FIREBRICK"

The corner and center blocks are finished. Note the door forms in place ready for completion of the work of plastering.

Where this equipment cannot be replaced for lack of funds, however, the joints may be pointed with some suitable material and both joints and brick covered with paint, thus materially reducing the leakage of air through the pores and cracks of the brick and jointing material. By plastering the interior with some of the firebrick substitutes just described, the walls, where in bad condition, may be further tightened and made more permanent. Most of the air that leaks into a boiler through the walls, not being under control, lowers the temperature of the flue gases without in any way aiding in combustion. The more air passing up the furnace stack at 600 deg. F. or thereabout, the more heat is being wasted to the atmosphere.

Carbon-Dioxide Bombs Buried in Coal Pile Extinguish Fire When Plug Fuses

WALTER L. WEDGER, chemist of the explosives and inflammables division of the Massachusetts Department of Public Safety, describes the use of bombs and tetrachloride of carbon in the extinguishment of fires in stored coal, says *National Safety News*.

Several devices are in use to extinguish fires at the bottom of huge piles of coal. Professor Lewis describes the following ingenious method: Steel bombs filled with liquid carbon dioxide are placed in various parts of the pile. They are provided with a fusible plug which melts at 93 deg. C. or about 200 deg. F. If the temperature of the coal pile rises to the degree at which ignition probably would take place, the plug melts and the carbon dioxide escapes, cooling the coal and extinguishing the fire.

Long pipes often are driven down in the coal where the smoke appears thickest and through them carbon tetrachloride is poured. On striking the fire this liquid forms a vapor five times heavier than air, which sinks downward, extinguishing the fire by depriving it of the oxygen necessary to maintain combustion.

COAL AGE

C. E. Lesher, Editor

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Saving of Ventilation Power Costs

As THE Kathleen mine is by no means an old one and the coal is thick, its charges for ventilation, given in this issue in an article contributed by Eugene McAuliffe, are by no means unduly high, whereas the charges for haulage are quite a little above normal, as heavy grades are encountered, making transportation costs disproportionately heavy and so lowering by that fact the percentage rate of the power costs of ventilation. Yet the ventilation charge was as much as 15.7 per cent in the coal year 1921-22. Probably at Kathleen the percentage could not be reduced greatly except by somewhat steadier work, but certain it is that at many other mines where it is even higher it certainly could be.

The older forms of brattice are a delusion and a snare. Even if a perfectly tight brattice could be built of double boards or double boards and battens, with the use of a little mud frequently replaced, it would not be tight, for the leakage round the edges would be found to be considerable. Suppose in a single mine there are four hundred brattices, the coal being six feet thick and the crosscuts eight feet wide, then the total peripheral length of these brattices would be more than eleven thousand feet.

If the crevice along that periphery were only one-sixteenth of an inch wide, the area of the openings thus made would be a little less than sixty square feet, which would be equivalent to a crosscut six feet high and ten feet wide. Of course, the resistance of such crevices, seeing they are narrow and often quite crooked, would be far greater than would be afforded by the opening indicated. Still it is easy to see that the loss is of great importance and a study of it will do much to explain why a large proportion of the air in the main airways entirely fails to reach the face.

For this reason a material should be used for brattice fitting, and for brattice building also, that is more permanent than kneaded fireclay. A substance with so little cohesiveness and with so much contractility is sure to crack even in the dampest of mines. A two-inch brattice, even if tight at the sides, may not hold back the air, for small threadlike currents can leak through the crevices in the rock at the top, the coal at the sides and the clay in the bottom. By the use of a cement brattice not only is a tight joint secured between the brattice and the ribs but the rock, coal and bottom can be made tight by cementing all three for a few inches or a foot beyond the face of the brattice.

This has become a common practice in metal mines and it is worthy of acceptance in coal workings, where the length of the roadways makes the aggregate leakage greater than it is in metal mines. The adoption of this plan should greatly reduce those many but important losses which are so small at any one given point that they cannot be found by a flame. The flame test is by no means infallible. Many a brattice which the flame of an open oil torch would attest tight will allow appreciable quantities of air to pass through it and past it. It is needless to point out that a gunite or cement stopping will be more effective than one which is built of boards or brick.

If a brattice is put at both ends of each crosscut a still better stopping will be obtained, especially where the water gage between the airways thus isolated is considerable. Where the old brattice is behind a pile of rock a new brattice built in front of or behind it will save the removal of the rock and give increased protection against leakage.

Engineers are not any too well versed as to the speeds with which the air is made to travel airways of different kinds. This should be a matter of careful investigation. For each kind of airway the velocity should be not more than a certain percentage greater or less than the velocity in the airshaft. In overcasts the velocity should be low, though in most cases the air is caused to move more rapidly there than anywhere else. When consideration is given to the crooked course of the air in passing over an overcast and to the increase of friction due to changes in the form of the passageway, it will be realized that ample dimensions are most necessary at this point. Yet at overcasts the cross-section usually is smaller than anywhere in the split thus ventilated. No careful study of the air velocities in coal mines has ever been made. Shafts are designed large enough to take care of transportation, water pipes, stairways and all the other desiderata, but the air usually is expected to get up or down in some manner or other, opposed in the upcasts often by streams of falling water. This is not as it should be.

In many cases it would pay to line shafts with concrete, not alone because they would be more permanent but because they would pass more air. Even in the mine where high-speed currents are encountered it often would pay to concrete passageways instead of timbering them and even to cut straighter roadways, so that the air would not be eddying past difficult turns. The analysis of costs of power as given by Mr. McAuliffe in this issue should be duly studied as are labor costs, for there is no question but that some could be greatly lightened as a result of such studies. Not the least of such inquiries would be one relating to ventilation.

Choice of Machinery

IN THE choice of machinery none but those units which may be expected to function with a minimum of breakdowns or failures should be selected. Machinery should be chosen that does not occasion constant worriment and uncertainty and will do the work with a broad margin over and above what is desired from it without being so cumbrous as to waste power in operation. It is well to have plenty of power, but if it be obtained through the use of larger units than will be needed in slack or idle times the mere work of turning them over will be excessively costly. Expenditures, however, in the purchase of machinery that functions completely always is profitable. Ample safety, ample protection against overheating, proper regulation and durable wiring may not be advisedly overlooked.

Some would say that a good machine should last indefinitely, but machinery is bettered year by year and the method of operation may change. Speeds of operation increase, new forms of regulation are introduced and no machine can be permanently the best of its kind. So a machine is built for time, not eternity. But if it be not up to date and fully functioning at the start what hope is there that ten years hence it will be anywhere in the race? There is no reason, surely, for buying and installing what is from the start inferior to that which the industry regards as the best to date. A better indeed may come later, but when it does it will be further ahead of the older type of machine than it is of the one which represents the foremost model of the present day.

The reason, then, why good workmanship and material are recommended is not because such a machine will last indefinitely but because in the decade or more that it is kept running it will function with constant satisfaction. The superintendent has enough difficulties of operation at best, what with labor problems, marketing difficulties, fires, floods, explosions, roof falls and irregularities in coal thickness. Consequently it is well for him to have his mechanical problems settled rightly from the start. Too many managers and superintendents are handicapped by the purchase of improper machinery. The uncertainty of these makeshifts is sure to involve their owners year by year thereafter in constant difficulty.

Light That Blinds, But Not Illuminates

FOR many years automobile owners sought to equip themselves with brighter and ever brighter lights. The wayfarer traveling along the road was blinded by the brilliance of the lamps and could see nothing—neither what was along the line of the beam nor what lay out of its range. Nowadays a more diffused and mellower light is preferred, and legislation has required it. The light is less but the public can see better.

When will we learn that a diffused light in our industrial affairs would be better for the public than a glaring spotlight on certain industries and gross darkness on the others? Good roads are as necessary as railroads, are as much a part of our life as coal. The industry of making good roads, how is it functioning? We have seen no records other than those in Iowa.

There, H. K. Davis, chief inspector, Iowa Highway Commission, Ames, Iowa, has made a careful investigation into the time during which work on contracts lasts, and in the *Engineering News-Record* of May 4 says that the average length of time used per concreting road outfit was 114.3 calendar days. When Sundays and legal holidays were omitted, however, this average shrunk to 96.1 calendar days.

"Eliminating all rainy days and other stops," says Mr. Davis, "leaves an average of 74.1 days per outfit on which concrete was actually laid during the season. Not all of these were full days, as many of them show only short runs, rain or breakdowns stopping the work for the remainder of the day. To the highway commission and the contractors of Iowa it was a distinct surprise to find that all the concrete laid in a season's work could have been concentrated in two and one-half months of steady work if only the causes for delay could have been eliminated." He adds that the average showed that only 54.7 full days were worked, a day being reckoned full that had no delay of more than 45 minutes.

Doubtless road making is in a degree no more the life work of a laboring man than is snow shoveling, and it would not be fair to overlook that some of these concrete men may find work in other parts of road making, in farming, in lumbering and other odd jobs throughout the year, but men who take part in such a highly seasonal occupation and one with which the weather so severely interferes must necessarily have an immense amount of lost time.

So far, the public has not insisted that this class of work "function well." Indeed, it never has decided how badly an industry must function to absolve itself entirely of the charge of functioning badly. All we know is that if any industry works only two-thirds of the year it is in line for the record as the worst functioning industry, but if it works only 74 days in the year it can entirely escape such an imputation, for it comes under the head of a casual industry, to which everything is forgiven. It is one of those ne'er-do-wells that a busy world finds no time to censure. An industry that runs as much as two-thirds time is an established citizen that should be 100 per cent perfect because the public feels it ought to be able to rely on it. It is a fit subject for scandal and for gossip. Of those who do nothing, expect nothing. Of those who do well, expect everything.

Beware of the light that illuminates only a part of the road. Paraphrasing Kipling, "How shall they know of coal mines who only coal mines know?" If we do not study all the industries we cannot form a well-balanced judgment of any one. Hence it is truly comforting to know that, led by Mr. Hoover, who penned the indictment against the coal business as the "worst functioning industry," the construction men are somewhat belatedly assembling and organizing to see if there is not some way by which they can make their operating time more closely approach the length of the calendar year.

Now We Learn About Costs

AT NO time do depreciation costs show up more plainly than when the mines are idle. During such periods the repairs and renewals which have to be made not only cannot be taken from profits but cannot even be partly hidden under the disguise of costs of operation. They are often the only expenditures that a mine makes outside of those involved in ventilation and drainage. And how they do irk.

It is often said that the idle house runs down quicker than one that is occupied. This is partly true, for the proprietor is rarely willing to spend the necessary upkeep money or to furnish the superintendence that will make decay less rapid. It is also partly untrue. Much of the difficulty arises from the fact that we more clearly visualize the repairs of an idle house and its depreciation with the interest and taxation charges as the only tangible evidences of proprietorship. The expense is absolutely all we see.

Consequently the day when this is borne home on us in force is the time when we hunt around for a remedy. We look for pipes that will not corrode, timber sets that will not rot, roadways that will not cave, pumps that will not break down, valves that will not leak, waterways that will save pumping, methods of working where the face will not be buried and many other desirable economies. These sobering periods should surely make us spend money to save money. During them we learn that the frenzied periods never last but are always likely to be followed by longer periods of low profit or of loss, and we consider business from the point of view of investing money to save money rather than from that of investing money to make more.

Problems of Operating Men

Edited by James T. Beard

Cost of Production Affected by Incompetence of Many Mine Foremen

Many Foremen Unfitted for the Position They Hold—Superintendent to Blame If Mine Is Ruined—More Thorough and Frequent Inspection of Mine Required—Instances of Mismanagement Cited

A SHORT time ago reference was made, in an interesting letter by James Thompson, *Coal Age*, Feb. 23, p. 333, to the manner in which the cost of producing coal is largely affected by the vagaries of the foreman in charge of the work.

The letter called attention to a worth-while subject for discussion; and, while fully agreeing with all that was said, I wish to add a few thoughts suggested by the reading, in the hope of impressing on the minds of all of us what it means to employ competent foremen and superintendents in coal mining.

In my way of thinking, foremen compare favorably with housekeepers. Some are good, others ordinary, while a stray one here and there has nothing that would recommend him for taking charge of any kind of work, much less that of coal mining.

Why Do Incompetent Foremen Aspire for the Position

With regard to this last type of foreman, the wonder of it all is that they aspire at all to the position. It is a puzzle to know by what means they are able to hold the job. Too often it happens that the man is retained until things actually go to pieces in the mine.

When that is the case it is because there is not sufficiently close relations existing between affairs on the surface and underground. The way to overcome this condition is to maintain a regular system of mine inspection and employ some competent and disinterested party who will report the true conditions of affairs to the management or the owners of the property.

I fully agree with the remarks of R. J. Pickett, writing on the subject "Do Foremen Sleep on the Job?" in the issue Apr. 27, p. 700. Mr. Pickett places the blame for the ruination of a mine squarely on the shoulders of the mine superintendent.

With that writer I believe that, ordinarily, the superintendent is to blame for a mine being hogged out by an incompetent foreman in charge. It takes time to completely ruin a coal property, and when that happens it is evident that the superintendent himself is either an unpractical man or has failed in his official duties, by not making thorough and frequent visits, going into the mine and closely inspecting the workings.

Duty of Superintendent To Make Frequent Visits in the Mine

A practical mine superintendent will go through his mine at least once a week and familiarize himself with every detail of the work in progress. By so doing he would observe all questionable practices in the economic mining of the coal. It is the province of the superintendent to oversee and correct whatever is wrong, after due consultation with his foreman.

We are all, more or less, prone to make mistakes, but we fail when allowing ourselves to make the same mistake twice. I recall, now, one operation that had, for a long time a continued run of bad luck, because the superintendent seldom went into the mine, claiming that he had hired a foreman to look after that work.

Shortly, the time arrived when it was a real battle to get the coal out. Among other bad practices, it was the custom in that mine to quit a room when it encountered a slightly adverse condition. The miner driving the place would be given another room and so the work went on leaving behind coal that could not be recovered later, except at great expense.

In robbing, pillars were drawn back by taking long slabs off the rib, which often made it necessary to leave many end stumps. When the entry pillar was reached, instead of stopping the man, the boss would say, "Bill, work there another day, as I have no other place ready for you."

Another and still another day would follow, the man getting easy coal by slabbing the entry pillars, until they became too thin to furnish the needed support on the entries. This sort of work gave no end of trouble on the roads and greatly increased the cost of operation.

Another foreman took charge, and, for a time, succeeded in increasing the daily tonnage, which pleased the management. But, all at once, things again went to pieces when it was found that the new foreman had pulled the standing pillars under a wide valley that was often flooded during wet seasons, which was the reason why these pillars had been left.

Let me say in closing, the best insurance for the uniform production of coal is a frequent rigid inspection of the mine, by a capable man who is familiar with conditions in that particular field.

George Edwards.

Pikeville, Ky.

Good Mine-Car Hitchings Assist Production of Coal

Different kinds of mine-car hitchings in use — Couplings adapted to different styles of equipment — Effect of slack in hauling long trips of mine cars.

ONE of the important features in reducing the cost of operation and assisting to increase the production of coal is the selection of a suitable form of mine-car hitching. This subject was discussed by George Edwards, *Coal Age*, Feb. 16, p. 292, who drew attention to the need of adopting a good form of coupling on mine cars, in the interests of safety.

There is no greater annoyance, in the operation of a mine, than to have the day's run suddenly interrupted by a wreck occurring on the main haulage road. This is especially provoking when it is considered that the thing might have been avoided had a little more attention been given to providing a form of car hitching better adapted to the conditions existing in the mine.

Different Forms of Couplings for Varying Conditions

That there are numerous kinds of these hitchings now made and in use at the mines, today, is well known. Practically all of these have advantages and disadvantages that make them more or less suited to different conditions of haulage. Naturally, the best form of hitching to use in any particular case must be determined by the system or type of haulage employed and the kind of equipment in use.

Because one form of coupling has been found to give satisfaction at one mine, there is no reason to conclude that such coupling is the best form to adopt. A careful study must be made of the conditions that make that kind of coupling a success. If these conditions are identical with those in question one may rightly conclude to adopt the same form of hitching.

In the letter to which I have referred, Mr. Edwards expresses a preference for the coupling having three small links and two clevises. From this I am led to believe that he is using cars equipped with two bumpers, which is the style of car that I consider requires such a hitching.

On the other hand, cars equipped with but one bumper, or with the half-moon style of bumper, I believe are better coupled with a single link and two pins. In practice, I have found this coupling superior to any other form of car hitching. Experience teaches, however, that the cars themselves must be kept in good condition and the drawbars in proper shape, if trouble is to be avoided.

One feature that must not be overlooked is the amount of slack it is safe to permit in hauling a long trip of cars. This may vary from three to six inches between cars. In any case, the allowable amount of slack must be regulated by the kind of haulage performed.

It is astonishing, at times, to observe the amount of coal that has fallen off cars in transit, owing to the cars having too much slack when hauled over roads of variable grades.

Benefit Results from Changing Style of Coupling in Use

Just now I recall one instance where we exchanged the three-link coupling attached to the cars by two clevises, for a coupling consisting of a single link and two pins. The result was that the motorman could handle longer trips, without losing a third of the coal that formerly fell from the cars in transit.

While admitting that the three-link coupling has certain advantages that recommend its use, owing to recent improvements in that style of hitching, it can hardly be denied that much time is often lost by reason of the pins falling out from the clevises when the latter are dragged along the haulage road. This is liable to happen if the hanger provided is loose or someone has failed to hang up the coupling before starting the trip.

Finally, reference has been made to men being frequently crippled in the use of a single-link coupling. That, however, is largely due to their own carelessness and, I believe, is apt to occur whatever form of coupling is used. In gathering-motor haulage, I much prefer the half-moon bumper coupled with a single link and two pins, which I believe gives better satisfaction than any other form of hitching made.

———, Ky. Motorman.

Natural-Born Miners

Long training and association make natural born miners — Economy in production of coal requires natural mining ability — Prejudice of foreign miners not a factor.

IS IT true, as stated in the letter of James F. Gamille, *Coal Age*, Feb. 23, p. 333, that "one of the great drawbacks in American mining, in respect to the adoption of economical methods, is the large number of English, Scotch, and Welsh miners in charge of the work in our mines?"

It puzzles me to know why this correspondent did not include Irishmen, in his category of miners who are drawbacks to progress in American mining. It may have been fear of the proverbial pugnacity of the Irishman that caused his exclusion from the list of undesirables.

Perhaps, our friend has been told the story of the Dutchman who was heard to remark "My father, brother and myself met a drunken Irishman; and, in the altercation that followed, we nearly succeeded in licking the man, but all we had was a butcher's cleaver."

Foreign Mine Officials Not Men of One Idea as Claimed

In my opinion, the correspondent displays more narrowmindedness, in his statement, than he alleges is possessed by the average English, Scotch and Welsh miner, whom he charges as being "largely men of one idea," adding, "It is difficult to impress them with the advantage of a new plan."

Personally, I have had no experience in Pennsylvania but, in the Rocky Mountain region, have found many brilliant coal-mining men of British birth. Rarely have I heard the expression "It was never done that way in the old country."

Though it is often claimed Englishmen are slow to perceive a joke, they are not as dumb as the new arrival in this county (we will not state his nationality), who calmly took as a joke the most serious statement.

Sitting by the open window of a train, one day, the man was warned by the conductor, who shouted, "Lookout, we are coming to a tunnel." Instantly, the man stuck his head out of the window, only to have his cap brushed off by the close proximity of the tunnel walls. Jumping back he exclaimed, "By Jove, this is a funny country; they say 'Look out' when they mean, 'look in.'"

Long Training and Association Makes for Efficiency

Seriously, it would seem to an unbiased observer, that the long training and association of foreign-born miners who come to this country must make more efficient and competent mine workers than many men who go into the mines, either because of the high wages it offers or by reason of their inability to find other work.

Surely it is not claimed that farm laborers, tramps and other wanderers in search of work can be classed with men born in mining countries and trained, from childhood, in that occupation. They are natural-born miners. As well might we expect to breed race horses from Indian ponies, in one generation.

Practical mining men know that economy in the production of coal requires natural mining ability. Observation in this part of the country enables me to say that, out of twenty men other than British extraction, at least fifteen are attracted to the work by the high wages paid.

Now, contrast this attitude with that of the average foreign-born miner, who has no aspiration that would take him out of the mine where he expects to spend the remainder of his days. If he *has* prejudice in favor of methods and ways with which he is familiar, this is not a factor to be considered as a "great drawback" to the economical production of coal.

To offset this prejudice there is the inborn ambition to follow, with close study, the coal-mining game and to make his work most effective. I offer this as the reason for the large proportion of English, Scotch and Welsh mine officials who have been advanced to positions of responsibility in American mines.

Needless to say, I am a British-born American citizen, simply because I can see that the American form of Government is better than that of Great Britain; and the opportunities afforded my children are greater in this country where large areas yet remain undeveloped.

Oak Creek, Colo. Thomas Allen.
The Moffat Mines.

Economy in Coal Production

Concentration of work reduces cost of operation — Less time lost by foremen traveling from place to place — Better supervision of work and fewer accidents — Good track arrangements avoid congestion.

HAVING always a practical regard for the ideas of others, it has been my custom to observe closely the ways and means used in different mines to reduce the cost of production. Experience in over two score of coal mines where I have worked has convinced me that there is one chief element in producing coal at a minimum cost.

In almost every mine one enters, the close observer is impressed with the great lack of concentration of work. Naturally, there is a correspondingly high maintenance cost that could have been avoided and much of which it is possible to eliminate at the present stage of the game.

No extended argument is required to prove that where work is concentrated there results a great saving in many ways. For example, there are fewer roads and travelingways to maintain in a mine. The foreman and his assistants lose less time, in going from place to place; there is a far better supervision of the work and fewer men are required for that purpose.

Fewer Accidents Happen

No one will deny that, under these conditions, fewer accidents will happen at the working faces and on the roads. There is less liability of cars being derailed and wrecked, because more attention is given to keeping both the track and cars in good condition. Moreover, a less number of cars will suffice to operate the mine.

When a wreck occurs on a road in an isolated portion of the mine there is bound to be much delay as little or nothing can be done until word is sent to the mine foreman or one of his assistants and he reaches the place and takes charge of the work of clearing and repairing the track.

Consolidating the Work Gives Increased Tonnage

Not long ago, I tried out a scheme, in a mine of which I had charge, with the result that a larger tonnage was produced at a less cost and better supervision given to the work. In that case, there were 25 less cars required to run the mine and the arrangement afforded less congested sidetracks.

In the average mine, having an output of from 1,200 to 1,500 tons of coal per day, there are from five to six sidetracks, each holding, say from 35 to 40 cars, waiting for drivers to haul them out of the mine, or take them into the working places.

In most cases, it is possible to consolidate two or more of these sidetracks and when this can be done to advantage, it will effect a considerable saving in the cost of operation. This, of course, will depend on the conditions in the mine. In any case, the arrangement should provide automatic switches that will close with a springpole as the cars pass out onto the main track.

Under favorable conditions, using cars holding 3,000 lb. of coal, where the average haul does not exceed one-quarter mile, round trip, 9 mules should handle 750 tons of coal in eight hours. Under the same favorable conditions, this might represent the output of 90 men working in a single section.

In closing, let me say a close study must be made of the conditions in the seam and the work planned so as to afford the greatest concentration of men. The haulage arrangements and sidetracks must be such as to avoid congestion and delay.

Central City, Ky. Ostel Bullock.

CORRECTION

By mistake the inquiry entitled "Blasting Machine-Mined Coal," which appeared in *Coal Age*, Mar. 30, p. 538, was signed "Superintendent," instead of "Tracklayer," as it should have been, coming as it did from one of the track employees of the Colorado Fuel & Iron Co., at Berwind, Colo.

Inquiries Of General Interest

Mine Foremen's Qualifications Required in Different Coal-Producing States

Many States Have No Law Requiring Certification of Mine Foremen —Chief Requirements Relate to Citizenship, Age, Character and Experience of Candidate—Some Companies Examine Their Own Men

Contemplating visiting the States in the near future, with a view to locating in one of the coal-mining districts wherever the conditions appear most favorable, I shall very much appreciate seeing, in the columns of *Coal Age*, a brief outline of the qualifications required of candidates for mine foremanship, under the different state mining laws. I understand there is a considerable difference in this respect, some of the states being more strict in their requirements than others. Candidate.

Nanaimo, B. C., Canada.

The laws of many of the coal-producing states make but slight mention of any requirements relating to the operation of the coal mines in those states. Almost 50 per cent of the coal states practically ignore the matter in their codes.

The states having the most complete coal-mining laws, in the order of their importance, are the following: Pennsylvania, Illinois, Colorado, Alabama, West Virginia, Iowa, Tennessee, Ohio, Indiana and Kentucky. The states of Missouri, Kansas, Oklahoma, Utah, California, Washington and Wyoming, with a few others, have laws regulating, to a greater or less degree, the mining of coal.

The chief requirements of coal-mining laws relate to citizenship, age, character and experience of candidates for the positions of mine foreman and assistant foreman and fireboss. It is only possible to enumerate these requirements as specified in some of the states where the laws are more specific. The requirements of candidates seeking the position of mine foreman in the principal coal states are the following:

Pennsylvania—The anthracite mining law requires a candidate for the position of mine foreman to pass a satisfactory examination before a state mining board and furnish satisfactory evidence that he has had at least five years' practical experience, as a miner, is capable and of good habits.

The bituminous mining law of this state requires the candidates for the position of mine foremen to be citizens of the United States, of good moral character and known temperate habits, at least 23 years of age and to have had at least five years' practical experience, after 16 years of age, as miners, mining engineers or men of general work inside of the mines of Pennsylvania. Bituminous mine foremen's certificates are of two grades; the first-grade certificate makes the holder eligible to appointment in a gaseous mine, while the second-grade certificate limits the appointment to non-gaseous mines. Both of these certificates require the candidate to have received 80 per cent in his examination.

The amended Pennsylvania law, both anthracite and bituminous, legalizes the appointment to this position of uncertified men who, in the judgment of the operator, are equally competent with the holder of a certificate. The law also provides for the granting of service certificates.

Illinois—The law requires a candidate for the position of mine manager (foreman) to be a citizen of the United States, at least 24 years of age, with at least four years' practical mining experience, a man of good repute and temperate habits. The candidate must pass a satisfactory examination before a duly appointed state examining board. The law provides for first-class and second-class mine managers' certificates, the latter limiting the holder of such certificate to service in mines employing not more than ten men.

Colorado—The law requires a candidate for the position of mine foreman to pass an examination before a duly authorized state examining board and to have had at least five years experience in coal mines in the United States, and to have worked underground, in coal mines in Colorado, for at least six months immediately prior to the examination.

Alabama—The law requires applicants for first-class mine foremen's certificates to be at least 23 years of age, and to have had at least five years' practical experience, three years of which shall have been spent in coal mines after the applicant has attained the age of 15 years, serving as mine worker or in an official capacity, at or inside the mine. The applicant must be a citizen of the United States and furnish a certificate of good moral character and known temperate habits, signed by ten reputable citizens where he resides. Certificates of the first class relate to service in mines generating gas, while second-class certificates relate to mines not generating explosive gas.

West Virginia—The law requires a mine foreman to hold a certificate of competency granted him by a state mining board upon passing a satisfactory examination before said board. The candidate must be a citizen or resident of the State of West Virginia and have had at least five years' experience in the working, ventilation and drainage of coal mines.

Iowa—The law provides for the examination and certification of candidates for the position of mine foreman and specifies the candidate must pass a satisfactory examination before the state examining board, as to his qualifications and fitness. The law provides for the granting of service certificates to candidates producing satisfactory evidence of four years' continuous and capable service as mine foreman.

Tennessee—The law requires the applicant for certificate to act as mine foreman to be a citizen of the United States and to pass a satisfactory examination before a duly appointed state examining board and to give evidence of good conduct, honesty, capability and sobriety. In all mines generating gas or dust in dangerous quantities, the foreman must hold a class-A certificate.

Ohio—The Ohio mining law does not provide for the examination or certification of candidates for the position of mine foreman.

Indiana—The law authorizes the state mine inspector to hold examinations for certificates of service and competency at Brazil, Terre Haute, Washington and Evansville, in the state, and requires him to publish notice of the time and place when holding such examinations. Applicants for the position of mine foreman must be citizens of the United States.

Examination Questions Answered

Examination Foremen and Assistant Foremen, Fifteenth Anthracite District

(Hazleton, April 11-14, 1922)

QUESTION — *What duties does the mine law exact from the operator and the mine foreman?*

ANSWER—The duties are numerous. Briefly stated, they may be summarized as follows: To employ what assistant foremen are necessary to carry out the provisions of the law; to measure once a week and report to the mine inspector the air measurements taken, at the intake and discharge openings, and at the face of each gangway, and at the nearest crosscut to the face, in the inside and outside chambers of all headings where men are employed. The foreman is to have full charge of all matters relating to ventilation. He must examine all accessible parts of abandoned places, at least once a week, and see that the mine is examined each morning, if generating gas. Every working place must be examined each alternate day; and all slopes, shafts, roads and travelingways, signal apparatus and pillars, every day. The foreman must see that workmen are furnished with necessary timbers and instructed to make their places safe; prohibit persons from working unsafe places; regulate blasting in the mine; supervise the handling of cars, in rooms and on haulage roads; care for injured persons and report all accidents to the mine inspector, as required by law.

QUESTION — *What examinations of a mine are necessary according to law? By whom are these examinations to be made and how often?*

ANSWER—Besides the regular morning examination by the fireboss, in mines generating gas, the law requires the mine foreman or his assistant to visit and examine every working place in the mine, at least once each alternate day, while the men are at work in such places. The law also requires that the mine foreman, or some competent person designated by him, examine, at least once every day, all slopes, shafts, main roads, travelingways, signal apparatus, pillars and timbering and see that they are safe and in good working condition.

QUESTION — *What are the requirements of the mine law in regard to safety lamps? Also, what constitutes a good safety lamp? Give your reasons.*

ANSWER—The anthracite law forbids the use of any other light than that of a locked safety lamp, where there is danger of explosive gas existing in a place, or where the place is approaching another likely to contain an accumulation of gas. These lamps are to be the property of the owner or operator of the mine. All safety lamps in use must be examined and cared for by a competent person appointed for that work; each lamp to be securely locked before being taken from the lamphouse, unless permission is given by the mine foreman to use the lamp unlocked. No one but a duly authorized person may have in his possession a key or other contrivance for unlocking a safety lamp.

A good safety lamp, for work, is one in which the flame is completely isolated from the air surrounding the lamp, by means of a wire gauze chimney, all openings to the lamp being similarly protected. The air should enter the lamp at a point below the flame and the gauze chimney should be provided with a steel bonnet having suitable openings for the escape of the burnt air and gases. When such a lamp is properly examined and used by a competent person, it provides a reasonable protection against the ignition of gas by the lamp flame.

QUESTION—*What are the conditions that would render a safety lamp dangerous?*

ANSWER—If the lamp is imperfect, its gauze injured or clogged with dirt or soot, or the lamp is improperly handled by an incompetent person, exposed too long to a body of gas, exposed to a strong air current or blast of air, or allowed to fall, the lamp is no longer safe. A safety lamp is unsafe when improperly assembled or any part omitted.

QUESTION—*What action would you take should the gas flame in the lamp?*

ANSWER — When a lamp is surrounded by a body of explosive gas it will frequently happen that the lamp chimney will fill with flame. In that case, the person holding the lamp must make no quick movement but promptly and cautiously lower the lamp toward the floor, at the same time withdrawing quietly from the place, while shielding and smothering the lamp, if possible, under a coat or other garment, in an endeavor to extinguish the flame burning in the lamp. Any quick movement when a lamp flames is almost sure to force the flame through the gauze and ignite the gas-charged air surrounding the lamp.

QUESTION — *What instruments are necessary to measure the air currents of a mine? How is the quantity of air passing ascertained?*

ANSWER—To measure the air current flowing in an airway there is required an anemometer, which consists of a delicate vane that is revolved by the force of the air acting on the inclined blades of the instrument. The number of revolutions made by the vane are recorded and read on a dial. A watch is necessary to determine the time the instrument is exposed to the current. Each revolution of the blades corresponds to one foot of air travel, and the reading of the dial gives the number of revolutions of the vane. If the instrument is exposed one minute, this reading will be the velocity of the air in feet per minute. A tape measure is required to measure the height and average width of the airway. The product of these dimensions, in feet, gives the sectional area of the airway, in square feet; and this multiplied by the velocity of the air just found gives the quantity of air passing, in cubic feet per minute.

In order to find the power on the air or the power producing circulation, a water gage is necessary. Each inch of water gage corresponds to a pressure of 5.2 lb. per sq.ft. Hence the water-gage reading, multiplied by 5.2, gives the unit pressure on the air. Finally, multiplying this unit pressure on the air by the quantity of air in circulation (cu.ft. per min.), gives the power on the air, in foot-pounds per minute. Again, dividing by 33,000 gives the horsepower on the air.

Reports Are at Odds on Centralization of Coal Buying for Government Needs

By Paul Wooton

Washington Correspondent of Coal Age

TWO reports have been submitted to Colonel H. C. Smither, chief co-ordinator of the Bureau of the Budget, from the sub-committee on Co-ordination of Government Coal Purchases. In one of the reports it is recommended that a central coal purchasing committee be created as a permanent sub-committee of the Federal Purchasing Board. It is to be composed of a representative from the Navy Department, the War Department, the Bureau of Mines, the U. S. Shipping Board, and the Panama Canal. The suggested duties of the proposed central coal purchasing committee will be as follows:

To formulate and put in effect general regulations governing the policies and methods to be followed in the purchase of coal for all government requirements.

To oversee and co-ordinate the work of government coal purchasing agencies in preparing specifications and sending out requests for bids, and in making and awarding contracts for their coal supplies, whether for short-term or long-term periods.

To keep informed regarding all government coal requirements, the use of different kinds and grades of coal, plant equipment, coal-handling facilities, storage facilities and transportation, sampling, analyses and tests, as well as all other matters affecting government coal purchases.

To keep informed and closely in touch with market prices of coal, general conditions in the industry, transportation facilities and conditions, labor conditions, new coal-mining developments and new developments in the use of fuels, new fuels and methods of sampling and analysis, such information to be supplied to the different government coal-purchasing agencies.

To represent the government in all dealings with the coal industry involving the policies and methods of the government in making coal purchases to meet its requirements.

Those advocating the establishment of the central committee do not expect it to take over all of the work of the different coal-purchasing agencies of the government. These agencies would continue as heretofore to make their own purchases but assisted by the central committee, which would have a broader view of the government's coal requirements and which would have at hand exhaustive information regarding prices and market conditions. This would tend to effect, its proponents believe, a co-ordination of government coal-purchase activities in such a way as to result in greater economy and efficiency.

Those subscribing to the other report believe centralized purchase by one agency is uneconomical and unworkable. The requirements of the various government departments are so different that, it is contended, no one office could buy satisfactorily for all departments. It is argued that there are the same reasons for having a purchasing office in each department as there are for having separate government departments themselves. The point is made that a central coal-purchasing committee presumably would issue regulations governing the purchase of coal by the several departments. This, it is feared, would have the effect of transferring control of purchases from the individual departments to the central committee. Those favoring this report believe it would be very unwise to take away final control of coal purchases from the department or establishment which uses the coal and pays for it and which is held responsible for the expenditure of its own funds.

The plan for federal co-ordination in the procurement and supply of coal has been outlined as follows by Colonel Smither:

1. *Overhaul of Specifications.*—This to be handled by Specifications Board and not primarily for the purpose of standardization but to see that each activity buys the most economical coal for its purpose at its location. The following conditions stand in the way of flat standardization of specifications:

(a) Source of supply material rather than artificial. Coal must be taken (and consumed) by someone as it is found; it is not made to order.

(b) Cost of transportation is as big an element as the cost of the coal itself.

(c) Difficulty of reliable inspection.

(d) Great variety of grades

(e) Lack of uniformity in mines

(f) Great variety of firing conditions

2. *Standardization of Methods of Purchase.*—Fully covered by report of subcommittee

3. *Amount and Distribution of Stock.*

(a) *For Primary (Departmental purposes).*—This is a matter of departmental discretion, except where obviously exercised in error. Any departmental requirement must be determining, but where alternatives are permissible, the interests of the government as a whole should be considered.

(b) *Availability for Federal Purposes.*—What are the possible interests of the government as a whole as distinct from departmental interests. Interchangeability of supply in case of emergency, such as war, strikes, etc. Interchangeability of supply to aid in tiding over periods of high prices. This presupposes the existence of some competent market authority to decide when the government shall buy and when not.

What can be done to safeguard these federal interests without jeopardizing departmental interests. Have a clearing house for information as to stocks on hand. Have a medium by which one department in need can seek aid from another. Have one competent, reliable, responsible central authority on coal-market conditions to do the guessing for the whole government. See that he gets the benefit of all advance or secret information regarding mining, transportation and other economical and commercial conditions affecting the markets.

Freight-Car Loadings Increase 44,198; 12,187 More Coal Cars Loaded

CARS loaded with revenue freight during the week ended April 29 totaled 758,286, compared with 714,088 during the previous week, or an increase of 44,198. This was the largest number of cars loaded during any one week in April and was an increase of 37,202 over the corresponding week in 1921, but a reduction of 42,674 compared with the corresponding week in 1920.

Coal loadings totaled 75,632 cars, 12,187 more than were loaded during the previous week and the largest number loaded during any one week since the coal strike began. This was, however, 68,228 below the corresponding week last year and 93,086 under the total for the same week in 1920. Coke showed an increase over the week before of 343 cars, which brought the total to 7,952 cars. This was 3,175 more than were loaded during the same week last year, but 2,900 below the year before.

Freight cars idle because of business conditions totaled 529,658 cars on April 30, compared with 529,884 on April 23, or a decrease of 226 cars. Surplus coal cars totaled 235,077, an increase of 5,185 within a week, while an increase of 1,718 was reported for coke cars within that period, bringing the total to 5,387.

Tentative Program

OF THE

Fourteenth Annual Meeting

OF THE

INTERNATIONAL RAILWAY FUEL ASSOCIATION

Auditorium Hotel, Chicago, Illinois

May 22, 23, 24 and 25, 1922

Coal Features

Monday, May 22

Paper on Lignite Coal—Prof. E. J. Babcock, dean of the College of Engineering, University of North Dakota.

Tuesday, May 23

"Locomotive Fuel: The Life Blood of Transportation"—G. M. Basford, consulting engineer, Lima Locomotive Works.

Wednesday, May 24

"The Government and the Coal Industry"—T. H. Watkins, president, Pennsylvania Coal & Coke Corporation.

"The Various Items of Saving by Using a Better Quality of Coal"—Earl Cobb, president, Southwestern Coal Co.

"Assigned Cars for Railroad Fuel"—C. G. Hall, general manager, Walter Bledsoe & Co.

Report of Standing Committee on Storage Coal—H. H. Stock, professor of mining engineering, University of Illinois.

Thursday, May 25

"The Relation of Overdevelopment of the Bituminous Coal Industry to Transportation"—C. E. Lesher, editor, *Coal Age*.

"Standard Form of Contract Covering Purchase of Railway Fuel Coal"—W. J. Tapp, fuel supervisor, Denver & Rio Grande Western Railroad Co.

"Idle Day Costs"—F. S. Peabody, chairman of the board, Peabody Coal Co.

NOTE—The National Coal Association will be in annual session at the Congress Hotel, Chicago, May 24 and 25.

Declares Coal Is Steadiest of All the Great Industries of the United States

SPEAKING at the 27th annual convention of the National Association of Manufacturers held in New York City, May 8, 9 and 10, J. D. A. Morrow, vice-president of the National Coal Association, said that the present struggle between the mine owners and mine workers is one of the elemental struggles in American industry, a part of the after-the-war readjustment.

Mr. Morrow's subject was "The Outlook for Coal." He told his hearers that the bituminous-coal industry is one of the basic economic factors in our industrial development—the rapid extension of our manufacturing enterprises has been based primarily upon cheap coals—that the United States has had the cheapest coal of any of the great manufacturing nations of the world, and that it still has the cheapest coal of any. He denied that the coal industry is a seasonal industry. It is the steadiest of all the great industries of the United States, he said. The iron and steel industry is more seasonal than coal; so is the cement industry.

"And let me tell you," said Mr. Morrow, "that these advocates of stabilizing the production of coal, of regularizing the industry, who seem to think that all they need to do is to order the operator to run his mine regularly, have another guess coming. The operator would be glad if somebody would arrange it for his mine to operate regularly, but the consumer is the man who determines when a coal mine is going to operate; and if the government is going to see to it that the mines in those seasonal Western districts operate regularly throughout the year, some government authority must say to the householder: 'Today is the day for you to take your bituminous coal, whether you want it and are ready for it or not.'"

Production is increasing, Mr. Morrow said, and there is no reason at all to believe that it will not continue to increase and increase materially as the demand for the coal makes it possible for a number of mines to operate that have not been operating simply and solely because of lack of orders, not that they were shut down on account of a strike. They weren't able to find a demand for the coal.

"Now it is proposed that the government intervene in this strike," continued Mr. Morrow. "I suppose there are at least a thousand earnest, sincere theorists of some kind who know some definite, sure way of preventing this strike and preventing all strikes in the future. They can't all be right, because they don't all have the same idea. Right at the beginning then we can just set it down that a few of them are wrong.

"I want to add just one other suggestion to it: We had a pretty good object lesson in what the government could do and couldn't do in the regulation of business during the war. Suppose the government today owned all the coal mines, that they were nationalized, as Mr. Lewis, the president of the miners, demands, what would the government do about it? As a practical proposition what could it do?

"Gentlemen, it couldn't do a single thing that the operators themselves are not doing, except one. The one thing it could do is to tell you how much coal to take in and when and from what mines you are going to get it. That is all; not another single, practical thing could it do that would force these mines to operate more regularly, that would give these men steadier work, that the operators can't do. The operators wouldn't shed any tears at all if the government operated the mines. That is your problem. When John Lewis begins to talk about nationalizing the coal mines you want to understand he is talking about nationalizing your chief source of raw material.

What would happen to the cost of production under those conditions? Now, a railroad is all out on the top of the ground; you can see it; you can observe the condition of the track and the motive equipment; you can tell whether the agents of the road and the employees of the road are efficient, courteous, or not. A coal mine is all underground, subject to falls of the roof and to fires, and a thousand and one misfortunes can befall the investment. It takes the constant, careful scrutiny of the men whose money is invested in the property to safeguard the investment.

"What do you suppose would happen if the government clerks were taking charge of that? I suspect if it was in the hands of the government somebody would be sent to go down into the mines. You know what the result would be. There isn't anybody alive that could estimate how much would be added to the cost of coal in the United States if the government had the job of running the mines and supplying you with this coal.

"In conclusion, let me say this is one of the elemental struggles in American industry; it is a part of the after-the-war readjustment. The only reason the United Mine Workers today doesn't have this country and its industry at its throat is that there are four million tons of coal coming out of the ground every week from mines that are not subject to the unions and if the United Mine Workers can dictate the ways of operation, the wage scale in these union mines, you will pay more than you are now paying, or else you will see the gradual extension of these non-union mines because you will buy more and more coal from them. It is absolutely hopeless to expect that these two sections of the bituminous coal industry, two-thirds of it unionized, the other third non-union, will run along in competition with each other on the basis of a difference of a dollar or so in their production costs. You will have to answer that proposition. The coal operators understand perfectly well how you will answer it.

"As I said a moment ago, you are as directly interested in this coal strike as the men in it themselves are interested; it is as much your struggle as it is theirs. You want it settled on the basis of sound, economic principles, otherwise the base under your business is not steady and sound and stable. Therefore these coal men need your intelligent sympathy and your support, and I sincerely hope that they will have it."

Ashmead Broadcasts Lecture on Coal

ON SUNDAY, May. 14, Dever C. Ashmead, of Kingston, Pa., anthracite editor of *Coal Age*, delivered, by radio, a lecture on the mining and preparation of anthracite from the Newark station of the Westinghouse Electric & Manufacturing Co.

Owing to the large number of small radio sets with a limited radius, this lecture was also broadcasted from the East Pittsburgh station on May 18 and also from the Springfield, Mass., station of the Westinghouse company on May 15. It is estimated that about 500,000 persons were able to listen in.

THE PRINCIPAL SPEAKERS at the annual meeting of the National Coal Association will be the chairmen of the association's committees. The chairmen will tell the gathering of the work of their particular committees during the year and outline the things it is necessary for them to do during the coming twelve months. Each chairman's talk will be followed by interrogations and discussion from any member of the association.

J. G. Puterbaugh and A. J. Malone also will give talks on coal salesmanship. The meeting will be held at the Congress Hotel, Chicago, Wednesday and Thursday, May 24 and 25.

AFTER JULY 1 a separate coal commodity division will be set up by the Department of Commerce. F. R. Wadleigh will be its chief. At present the fuel division, of which H. C. Morris is chief, handles both coal and petroleum. With the beginning of the new fiscal year, however, petroleum as well as coal will be given the increased attention made possible by a separate division. Mr. Morris will continue with the petroleum work. Under this arrangement each commodity will receive the additional attention which the increased allotment of funds will make possible.

LACKAWANNA RAILROAD UNLOADING SMOKELESS COAL FROM BARGES INTO RAILROAD FUEL CARS, HOBOKEN, N. J.

Reversing the Normal Coal Movement

PRESENT conditions in the coal industry have resulted in a practical reversal of some of the normal currents in the flow of fuel. Thus under ordinary circumstances coal moves from the interior to the sea coast. This is particularly true of such ports as New York, the soft coal reaching this harbor coming almost exclusively by rail. At this port coal arriving on cars may be transferred to barges or lighters for delivery at points possessing water connections but being more or less remote from the place of transfer.

This normal movement is today so far reversed that coastal barges are now being loaded at Hampton Roads with coal from the non-union fields of West Virginia and Virginia and thence brought to New York, where their cargoes are transferred to railroad cars for shipment inland. The accompanying illustrations show such barges being unloaded at the docks of the Delaware, Lackawanna & Western R.R. at Hoboken, N. J. These photos also well illustrate the flexibility and general utility of the locomotive crane.

In size the barges used range from about 2,000 to 3,500 tons burden. They are usually made up in tows of two or three, the total weight of cargoes being from about 7,000 to 8,000 tons. Such a tow in charge of a tug can make the trip from, say, Lamberts Point in from 48 to 50 hours if the weather is fair.

LACKAWANNA RAILROAD TAKING FUEL COAL FROM BARGE "BALTIMORE"

Southern coal has been moving into New York Harbor in considerable volume since the strike began, but it is only in the last week that there has been serious effort made to reload this coal into open-top cars for inland delivery. The facilities in New York Harbor for handling coal are designed to unload the coal from cars into barges or scows, and it is generally recognized that facilities for picking the coal out of boats are entirely inadequate to take care of any large movement in the direction which is the reverse of normal. It is estimated that the locomotive cranes which are pictured in these illustrations will each load a railroad car in one hour.

LOCOMOTIVE CRANE TAKING COAL FROM BARGE "WELLESLEY" AT PIER 8, HOBOKEN

GASES AND COAL DUST fired by an electric arc caused the recent Sopris No. 2 mine explosion near Trinidad, Col., in which seventeen workmen lost their lives, according to a report just made public by State Coal Mine Inspector James Dalrymple. No specific blame was laid to any of the coal-mine officials. The explosive gases were accumulated through an open door in the underground workings.

FEDERAL INVESTIGATION of the eviction of miners from their homes in the Kentucky-Tennessee district has begun with the arrival in Knoxville, Tenn., of Dr. F. G. Davis, commissioner of conciliation of the Department of Labor, sent to that district at the request of District President S. A. Keller, of the United Mine Workers of America, that Washington authorities take some action in the matter.

90,509,075 Tons of Anthracite Produced Last Year; Value, $481,250,100

A TOTAL of 90,509,075 tons of anthracite, valued at $481,250,100, was produced in mines of Pennsylvania in 1921, according to preliminary figures made public at Harrisburg by James F. Woodward, Secretary of Internal Affairs. The mine workers during the year were paid a total wage of $283,961,300. In 1920 the tonnage was 79,364,600 and the coal had a value of $436,488,000 while the wages of the miners and workers amounted to $237,302,900. The value of the coal for both years is based on prices at the mines.

During 1921 there were 193 mine establishments in the ten anthracite counties of the state, and these mines gave employment to 166,820 employees. Of this number, all of whom were males, 77,571 were Americans, white; 172 were Americans, colored, and 89,077 were foreigners. There were only 25 boys under the age of sixteen years engaged in the operations. In 1920 there were 187 coal-mining plants in the anthracite counties and 144,551 employees were engaged. There were 67,299 Americans, white; 333 colored, and 76,919 foreigners engaged in the mines in that year.

Of the total anthracite mined in 1921 in Pennsylvania, the great bulk, as represented by valuation figures, was shipped outside of the borders of the state. The records show that while all of the anthracite mined in the state had a value of $481,250,100, the coal shipped out of Pennsylvania had a value of $390,829,000.

The number of employees engaged in anthracite mining last year, the amount of wages paid, the tonnage produced and the value of the production were as follows:

Counties	Average No. Employees	Total Wages	Tonnage Produced	Value of Output
Carbon	5,365	$8,624,300	2,720,017	$13,825,200
Columbia	1,350	2,251,000	909,715	4,348,500
Dauphin	1,786	3,036,200	818,723	4,177,400
Lackawanna	34,291	57,913,300	16,669,170	94,462,600
Luzerne	70,913	120,989,200	41,256,822	223,401,900
Northumberland	13,577	23,155,500	6,690,301	34,290,100
Schuylkill	36,877	63,540,400	20,013,357	99,602,800
Sullivan	765	909,800	350,838	1,748,500
Susquehanna	1,064	1,722,800	493,682	2,595,700
Wayne	832	1,618,800	586,450	2,797,400

Eight-Hour Day May Have Grave Bearing On Coal Industry of Nova Scotia

THE eight-hour day is now in effect in British Columbia, and is under discussion for the coal mines of Nova Scotia. The Canadian Institute of Mining and Metallurgy (May, 1922) thus summarizes the arguments:

"The question of an eight-hour bank-to-bank bill, as far as Nova Scotia is concerned, must be looked upon largely from the economic situation of coal mining in the province. The present eight-hour working arrangement with the mine workers is elastic, and means generally that the men underground work approximately eight hours. The surface men as a rule work eight hours and, occasionally, possibly eight and a half hours, so that the coal of the contract miners be taken out or away. The enforcement of a rigid eight-hour bank-to-bank day would mean, in many of the mines, that the miners would not be at work at the face for more than six and a half hours. A reduced output would be the certain outcome. Such reduction would mean that the cost of production would be increased or that the miners must be content with a correspondingly lessened wage.

Suppose the miners will not submit to any wage reduction; the increased price of coal to the public is worthy of most serious consideration. Further, it will so seriously affect the industry that efforts after competitive markets will be futile. The coal produced for sale in the province is comparatively small. The bulk of the output must be exported to points where it meets active American competition. Were this bill to become law, provincial would enter into competition with American coal, which to a large extent is produced under a nine-hour day. An eight-hour day in Nova Scotia means that, practically, a day would consist of not more than seven hours' work. In other words, the American operators would have the great advantage of the work of nine hours against that of seven hours of their Nova Scotian competitors. Then, also, it must not be overlooked that the United States are working coal under comparatively easy natural conditions. Nova Scotian mines are largely submarine, and therefore it is impossible to sink shafts to convey the men to points in close proximity to the working faces. The eight-hour law in Britain resulted in the closing of several submarine mines, and it is likely that the proposed bill would have a similar effect here; and if that should follow, what of the future of the industry?"

Organizing George Baer's Old District

UNDER the caption "Liberty and Union in the Coal Fields," in *The Nation* of May 17, 1922, Heber Blankenhorn says, in part:

"Somerset produced George F. Baer, president of the Reading Railroad, who in the great strike of 1902 assured the country that 'the rights and interests of the laboring man will be protected and cared for, not by labor agitators but by the Christian men to whom God has given the control of the property interests of the country.' His honored photograph adorns the walls of lawyers' offices near Somerset Court House. His gospel is the creed of Somerset coal operators today.

"Somerset County, bounded on the north by the non-union section of Cambria County and on the south by the Maryland border, buttressed on the west by the non-union Connellsville and Westmorland fields, has been kept non-union for years, excepting a half dozen half-submerged locals in the Meyersdale region. Now, twenty-seven mining towns are strike-bound and locals are organizing in every camp. Ten thousand men in Somerset, eight thousand in Cambrai, Indiana, and northeastern Westmorland counties, with the 43,000 of District No. 2 of the United Mine Workers, make a total of 60,000 on strike in central Pennsylvania, according to their leader, President Brophy. A big mine in Johnstown, a small one in Bell, mines in Vintondale and Colver and Charles M. Schwab's at Heilwood—these were about all that were left working on May 3. The operators call it a plot; it looks like a landslip. . . .

"Field headquarters of the union is at Cresson, on the edge of District No. 2. A room jammed with three desks, a table, two typwriters, two telephones. At the other end of the building, one of District 2's 28 co-operative stores. It is Saturday evening, April 22.

"Vice-President Mark at the telephone. 'No, President Brophy's down there at a meeting. Can't get anybody to you tonight. Arrange your meeting for Monday and I'll get you an Italian and a Slavish speaker.' All afternoon he has been answering calls from recently formed locals in Somerset. When he runs out of available men in the field, he calls up a union mining town 10 or 20 miles off and tells the local officer to take a jitney and speak at the designated point in Somerset.

"Railroaders drop in. They want to know if they can't distribute the union's papers on their run. Truck delivery men make the same offer. Organizer Donaldson, a youngster, reports how the meeting went at Cambria City. He had gone alone. 'The boys had a hall all right. I found the road in front of it blocked solid with the supers' and bosses' cars. There were just little passages left at each end of the autos for the miners to squeeze by, and about 40 thugs made a gauntlet there.'"

JAMES DALRYMPLE, STATE COAL-MINE INSPECTOR, reports that 12,909 men were employed in the coal mines in Colorado during March and that there was a total output of 982,868 tons. The total production in Colorado from Jan. 1 to March 31 amounted to 2,577,084 tons, an increase of 148,610 tons over the corresponding period a year ago. This is more encouraging than forecasters figured on when they made estimates a month ago.

Sixth Week of the Coal Strike

EDITORIAL REVIEW

FEDERAL intervention in the strike seems further away than it did a week ago. For a time stocks were being consumed so rapidly that it seemed inevitable that public inconvenience was about to result, with the necessary consequence of pressure for government intervention. The demand for coal, however, has increased to the point where it is evident that most requirements are being met by current deliveries.

Washington is watching developments in southeastern Kentucky with much interest. This first defection from the union is thought by some to be the beginning of disintegration which may spread to other fields where the union is not impregnably established. In this connection, however, it is pointed out that the union well can afford to lose some strength in borderland territory if it can bring permanently into its ranks the non-union men who have gone out in central Pennsylvania. Washington has not yet recovered from its surprise at the union's success in pulling out these men.

It has become increasingly clear that non-union operators have not profited by the lesson of overdevelopment in other fields. They have felt little of the financial loss which has visited other operators during the last eighteen months. The more favorably situated mines have enjoyed no small degree of prosperity. As a result a large number of new mines are being opened in non-union territory. Since overdevelopment in the non-union field is much more serious than in a union field, this tendency is being regarded with some apprehension.

When the freight-rate decision is put into effect it will be much easier to figure on wage rates. Thus far in the strike this factor alone has made for many uncertainties. With rates at the existing level, Illinois enjoys no small amount of tariff protection as against the East.

At the end of the sixth week the strike has practically faded out in so far as public interest is concerned.

New Bill Proposes Investigation Body of Three to Supply Data for Coal Legislation

A BILL creating a coal investigation agency of three members to "inquire into cost conditions in the coal industry" has been introduced in the House by Representative Petersen, of Brooklyn, N. Y., and referred to the House Committee on Mines and Mining. Unlike the Bland bill, which proposes a similar commission, the Petersen bill confines the work of the proposed commission to "providing information for Congress as a basis for legislation" and specifically to "determine what items make up the difference between the cost of coal at the mines and the cost of coal to the consumer." The proposed commission is to continue for one year. The usual inquisitorial powers proposed in similar bills for such an agency is provided in the Petersen bill.

Illinois Just Waits and Waits; That's All

NOTHING occurred in Illinois or adjoining states during the past week that gave evidence of bringing the end of the strike any nearer. Reports from almost every mining field told of peace and tranquillity reigning there, of married men living on their savings and the income of odd jobs, and of many unattached men drifting off to destinations unknown. The miners show few signs of suffering.

Operators, seeing little general demand for coal, are not fretting about non-operation. They fret more about the rumors now going around the country that they have made some sort of a secret deal with Frank Farrington, state mine leader, for the adjustment of the labor question at such time in the future as Farrington feels that his men are keen to go back to work. Some of the men would like well enough to get to work, according to stories brought in from the fields, but there is nothing but positive and indignant denial of the "secret deal" rumor.

Of greater concern to the substantial part of the coal trade in the Midwest region is the trend of affairs in Kentucky. There the swift ascent of prices and the many reports of broken contracts and questionable tactics on the part of some western Kentucky operators cause some apprehension lest bad business conduct draw down upon the whole coal industry the ire of a powerful government.

Anthracite Miners Object to Four-Year Agreement, with Annual Wage Adjustment

THE joint sub-committee of anthracite mine workers and operators negotiating a wage agreement held three sessions in New York City last week, an adjournment being taken on Wednesday, May 10, until May 16 to enable the miners to attend the 21st annual convention of the Pennsylvania Federation of Labor, which was held in Scranton.

At the session held on May 9 the operators submitted a proposal that an agreement be drawn for four years instead of two, as asked by the mine workers, and that the wage issue be adjusted each year. This met with opposition from the miners. A short session was held on May 10.

No intimation has yet been given by the operators as to what their wage demands will be.

West Virginia Coal Production Increasing Steadily Since Strike Began

COAL mining in West Virginia has shown an increase since the nationwide strike began, compared with the average monthly production for the preceding 10 months. Loadings in Logan, Williamson, Winding Gulf, Pocahontas and the Tug River districts have shown steady increases in the reports forwarded to the West Virginia Coal Association.

"Had the demand for coal been anything like some people expected at the time the United Mine Workers were planning to create a coal famine to win the strike, the nation would have found that West Virginia could have turned out much more coal than was produced in April," said Walter H. Cunningham, secretary of the West Virginia Coal Association. "The market is all that held us back. We have about 900 unconsigned cars of coal on railroad sidetracks, showing that we produced more than we could sell."

The production in the former union fields also has shown a continued increase and more operations are being reopened daily. In the New River district the petitions of miners for work at the November, 1917, scale, are being considered as fast as arrangements can be made to give them work, according to T. L. Lewis, secretary of the New River Coal Operators' Association.

In the northern part of the state many more mines were reopened in hitherto union districts during the last two weeks in April; the only difficulty the operators say they met was inability to take back all their employees.

The Logan field has broken all production records since the strike, having loaded as high as 1,200 cars daily, the average being about 1,100 cars. Total production for the month was 1,380,000 tons. Although there were only 25 working days in April, compared with 27 in March, last month's output exceeded that of March by 30,000 tons. Previous to the strike the average was about 1,000 cars a day. Before the strike, however, with the demand below normal, many days were lost and production was much below the average.

In the Williamson district the daily average production in April was around 24,000 tons, with an increase noted each week. Beginning with the week ended April 1, when 112,000 tons were loaded, the other loadings were:

Week ended April 8, 117,000 tons
Week ended April 15, 121,000 tons
Week ended April 22, 134,000 tons
Week ended April 29, 145,000 tons

"There are 35 mines now working in the Kanawha field, with a number ready to reopen," said Duncan C. Kennedy, secretary of the Kanawha Coal Operators' Association. "We are mining right up to the maximum of the demand and we can mine more if there is a larger market."

Union Losing Ground in West Virginia; Reverses Most Severe in District 29

SIX weeks of the strike in West Virginia has greatly weakened the United Mine Workers' organization and the longer the strike lasts the more certain it is that only a remnant of the union's former strength will be left. Not only has the union failed to gain ground in West Virginia but, it is reported, it has been unable to hold its own membership intact and union miners themselves are helping to break the strike either by going to work in non-union fields or by working in non-union mines in union territory, where they are not known.

The union is sustaining its most severe reverses in District 29, which covers the New River field and a small part of the Winding Gulf region. The union has made no progress in the Winding Gulf district and the effort to bring that region into the union fold has been given up, it is reported. Within the last few days it is said the Kaymoor, Elverton, South Caperton, Thayer and the Long Branch mines have all resumed operations. New River miners are now seeking employment in the non-union Winding Gulf region, where most of the men who struck on April 1 have returned to work. It is only a question of a few weeks, in the opinion of operators, before virtually all of the New River plants will be in operation, under an improvement in market conditions and through defections in the ranks of the strikers, and when New River miners are all back at work, it will mean that the Kanawha field alone will remain to the union, and even here the mines are gradually resuming work.

More than half of the 1,421 mines in the state are now on a non-union basis and the union can claim only between 500 and 600 mines as being under its control in so far as operation is concerned. Of the 550 mines in northern West Virginia, for instance, there are now 123 in operation, or twice as many as was the case at the inception of the strike, with the number being increased from week to week, as miners realize that they cannot depend on the union for any financial aid during a period of idleness.

Union Unable to Continue Rations, New River Strikers Would Return to Mines

THERE were breaks in the ranks of the strikers in the New River district of West Virginia before the middle of May, according to reports from this district. This is attributed by operators to the impression now prevailing that the United Mine Workers organization is not in a position to continue the issuance of rations to striking miners in the New River field. First reports of a general change in the situation were from Thurmond, where it was understood that miners heretofore on strike were seeking reinstatement at the various mines in the district. Not only were there reports of reinstatement but in many instances the men have already returned to work, as for instance at the mines of the Table Ridge Coal Co., the Rock Lick Coal Co., the Wee Win Coal Co., the Meadow Fork Coal Co., the Stover Coal Co., and the Elverson Coal & Coke Co.

Developments in the New River district, which has been affected more than any other smokeless field by the strike, lead operators to believe that within a short time virtually all the mines in this territory will be in operation again.

Deadlock in British Columbia; Operators Insist That Reduction Date from April 1

COAL mines of the Crowsnest Pass district and other parts of eastern British Columbia closed down on April 1. The situation is at a deadlock according to the Canadian Institute of Mining and Metallurgy (May, 1922). The operators are willing to have differences go before a board of conciliation, as provided by the Industrial Disputes Act, on condition that the reduced wage scale has effect as from April 1. The men want the present scale to continue while the board is in session. The operators are firm for their point and pending its acceptance have not named their representative to the board.

All union mines comprising District 18, Alberta, are closed, and efforts have been made to induce the men working in the unorganized mines in the province to join the strike. Considerable attention has been paid by the executive of the U. M. W. to the Brule mines, but the latest reports indicate that the men are well satisfied with things as they stand at Brule, and the mines there are working on full time. Attempts also are being made to bring out the miners in the Coal Branch, but it is unlikely that they will meet with success. The Evansburg district, following a reduction in wages, attempted to organize under the United Mine Works, but this proposal appears to have met with little support. Pembina Collieries, at Evansburg, however, closed on April 1 for an indefinite, period, owing to lack of orders.

Mines in the Edmonton district are still working, though not full time. This district is not organized under the U. M. W. A. and therefore has not been affected by the strike. The price of coal in Edmonton has fallen, and satisfactory settlements with regard to reductions in wages are being made with the miners.

Scott Conciliation Board Holds Session; Nova Scotia Dispute Still Unsettled

THE Scott Board of Conciliation appointed to investigate the wage dispute between the British Empire Steel Corporation and the Nova Scotia coal miners held a session at Sydney, N. S., on May 6. D. H. McDougall, vice-president of the corporation, presented the company's side of the case, contending that competition from American and English coal mines had been so keen that operators were compelled either to lower wages or stop mining coal. By trying to force a higher rate of wages the miners were seeking to destroy the livelihood of both employers and employees. West Virginia coal was underselling the output of the Cape Breton mines in Montreal and the company's hopes for a good season in that market had met with disappointed.

J. B. McLachlan, district secretary-treasurer of the United Mine Workers, on behalf of the miners presented statistics to show that wages had not increased in proportion to the rise in cost of living. Robert Baxter, district president of the union, demanded the production of the company's cost sheets covering a period of several years and was supported by Isaac McDougall, the miners' representative on the board. Vice-President McDougall said that while the company had no objection to producing these cost sheets for the confidential information of the board it was unfair to ask them to be given to the public. The matter was left over for further consideration.

All Quiet Again in Utah Coal Camps

COAL camps in Utah are extremely quiet following the declaration by state authorities that they were going to maintain order at any cost. It is difficult to say whether this is the quiet that precedes a storm or is evidence that the strike is collapsing. Many coal men take the latter view. State Industrial Commissioners Knerr and McShane are still at the scenes of recent trouble conferring with workmen and union leaders.

THE HIGHEST EXPLOSIVE KNOWN to science is made by combining idle hands and addled minds.—*Fremont Tribune.*

Colorado Operators Not Greatly Worried

OPERATORS in the Colorado fields show little or no concern over the strike situation. Since the declaration of the Victor American Fuel Co. for the open shop, practically all big operators are ignoring union organizations. All of the large operators in the state are mining more coal than they can sell in the present state of demand.

The Colorado Fuel & Iron Co. now has eighteen mines in the Walsenburg, Trinidad and Crested Butte districts in operation at a capacity more than sufficient to meet the demand of its customers. This company has the only large mine—the Fremont—in operation in the Canon City district. Two or three other mines in that district now working are wagon mines many miles from the railroads.

Other large operators in the Canon City district are not attempting to open the mines, mainly on account of the lack of demand. The Colorado Fuel & Iron Co. alone has at its loading points 400 cars of unbilled coal. This is true of all Colorado companies.

Practically the same situation exists in the northern field, where more coal has already been mined than can be disposed of. The Rocky Mountain Fuel Co., the National Fuel Co. and the William Russell Coal Co. are all operating mines in this district now.

State to Call Logan County Defenders In Blizzard Treason Trial

BEGINNING what it is believed will be the last week of the trial in Circuit Court at Charles Town, W. Va., of William Blizzard, president of subdistrict 2, United Mine Workers of America, charged with treason in entering into a conspiracy to levy war against the State of West Virginia, the prosecution was prepared to embark on a new line of evidence when court reconvened Monday, May 15. For more than two weeks the testimony concerned mainly the preparations for the armed march, raising of money, speeches at union meetings, the march, and incidents of the fighting itself. Just before adjournment Saturday the state began to present the other side of the picture, that of the Logan County defenders. The testimony of many of the men from all parts of the state who held the lines of defense against attack until federal troops arrived to restore order is expected this week.

Captain John J. Wilson, commander of the first troops to enter the troubled area, testifying May 8, said he made it his duty to learn what was in the minds of the miners, who, he declared, did not really know what they were fighting for. From the point of view of the regular army officer, he described the fighting as a "comic opera war," but in relating the activities of the company he commanded, he said he found Blizzard highest in authority of the men he met among the miners.

Other witnesses were Adjutant General Charnock of West Virginia and residents of towns close behind the irregular fifteen-mile line along which the forces met.

Under cross-examination the Captain said Blizzard showed no antagonism toward the federal troops, and that "without him it would have been a ticklish job" to disarm the marching miners. It was the general impression they were "glad the game was up and that the federal troops were coming in."

"They were obsessed," said the witness, "with the thought that the thugs from Logan were bent on destroying their homes and killing their women and children." When state's attorneys asked who spread this "propaganda" among the men, Captain Wilson said they got it "from their unions."

Testimony of ten other witnesses heard on May 8 was mainly in corroboration of details of the march and fighting formerly told.

The lives of Logan County defenders who were captured were in such danger that leaders of the attacking forces hid the prisoners in the mountains for safety, according to the testimony May 9 by Sam Hulme, one of the prisoners. Other witnesses told of the seizure of supplies and money and conscription of men by the marchers. The prosecution placed three army rifles in evidence. As a counter-exhibit the defense presented the casing of a bomb alleged to have been dropped by an airplane.

Testifying May 10, Edgar Combs said the column with which he was going into the hills met three men in a hollow, Combs and Rev. J. E. Wilburn, of Jeffrey, marching at the head as leaders, he said. The columns halted in such a way that he could not see, the witness testified, but he heard both sides ask for the password. Somebody said, "Amen," understood to have been the Logan password, and immediately about thirty-five shots were fired. Afterward, he said, he saw three bodies.

Trade Commission Files 169-Page Brief in Support of Right to Exact Cost Data

IN SUPPORT of its contention in its case against the Claire Furnace Co. and other iron and steel interests, that it has a right to require cost data from basic industries, the Federal Trade Commission has filed a brief and argument of 169 pages in the District of Columbia Court of Appeals. The brief was filed preliminary to argument before this court on the commission's appeal from the Supreme Court of the District of Columbia, which sustained the contention of the steel interests that the commission was without authority to require this information. Determination of the suit is of interest to the coal trade as the commission's right to gather statistics as to cost of production in the steel, coal and other basic industries is involved.

In its brief the commission contends that Congress has power to require cost data through one of its created agencies, that this power includes the right to require intrastate information, that the constitutional power does not rest alone on the interstate commerce clause and that the power is supported by long exercise and recognition. It also contends that the Federal Trade act lawfully grants the power exercised, and that no rights of the companies were invaded by seeking this cost data. The commission also refers to the taxing power, the census power, the war power, and the inherent powers of the government to obtain this information, refers to similar governmental activities, and the recognition of the value of the information sought and of regulation by publicity. A long list of court cases is cited by the commission to support its contention, as also a list of laws, including the Bureau of Corporations Act, the Federal Trade act, appropriations acts, Tariff Commission act, census law, National Defense act and the Interstate Commerce act.

U. S. Supreme Court to Review Bankruptcy Ruling Against Tidewater Coal Exchange

THE U. S. Supreme Court has been requested to review the decision of the Circuit Court of Appeals, Second Circuit, in a case involving credits and debits of the Tidewater Coal Exchange, which operated a coal pool at New York during the war. The case comes on appeal by the Delaware Steamship & Commerce Corporation vs. the New England Coal & Coke Co., the Seaboard By-Products Coke Co., Dexter & Carpenter, Tidewater Coal Exchange, Archibald McNeil & Sons Co. and the protective committee of shippers of the Tidewater Coal Exchange.

The New England Coal & Coke Co., the Seaboard By-Products Coke Co. and Dexter & Carpenter Co. filed in the Southern District of New York Court a petition in bankruptcy against the Tidewater Coal Exchange, setting forth that they were creditors of the exchange by reason of establishment by the exchange of credits for coal delivered to the exchange on their account. Due to withdrawal of excessive amounts of coal from the pool established by the exchange, it developed that some members of the exchange had paid $403,269 for coal drawn in excess of allotments while $1,182,034 was due from those who had not paid for excessive withdrawals. When the exchange ceased business in 1921 it notified the court that it was not certain whether it was subject to the bankruptcy act. The District Court decided that the exchange was bankrupt, which was affirmed by the Circuit Court.

Production and the Market

Weekly Review

WITH the Lackawanna Railroad taking smokeless coal from southern West Virginia by barge from Hampton Roads, unloading the barges in New York Harbor into open-top cars for railroad fuel west to Buffalo, and with the reverse of this, the Pennsylvania Railroad taking smokeless coal off the Norfolk & Western west and north to Columbus and then east to Manhattan Transfer, one has a picture of the topsy-turvy condition of the market in the East. The liveliest market this week centers in New York City and extends south to Baltimore. Except for water-borne coal from Hampton Roads there is little tonnage available in these markets, and the Inland buyer, who is not readily served by Tidewater delivery, is becoming panicky. There are not many coal consumers in the market in this area, but the price they have to pay for coal is increasing every day.

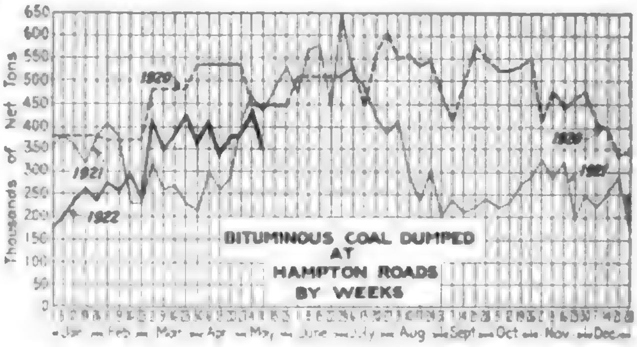
Lively Bidding for Available Coal

For the coal from the one real source of supply, southern West Virginia, West Virginia and eastern Kentucky, the Atlantic seaboard is bidding against the steel industry and the West. Spread over the whole market is the beginning of heavy buying by the railroads. Chicago is leaning heavily on western Kentucky, a union field operating under a contract that runs throughout this year. As an indication of what some buyers are willing to pay it is interesting to note that emergency freight rates established since the strike began, from N. & W. and C. & O. fields to Pennsylvania points range $3.38@$5.55 per gross ton, to which must be added, of course, the mine price of coal, which is now above $3.

Both the New England and Northwestern markets are quiet, and the market in the Far West is without feature. Demand for fuel for some steel plants on Lake Erie is moving coal in such volume from Toledo to Buffalo that boat rates have been marked up. It is reported that steel manufacturers at Sandusky have bought coal at Duluth and will ship it down. Canadian railroads are buying coal off the Duluth docks to be delivered by boat.

Coal Age Index of spot prices of bituminous coal increased 31 points to 261 on May 15. The number of coals that are available is steadily growing less as the supply of no-bills diminishes.

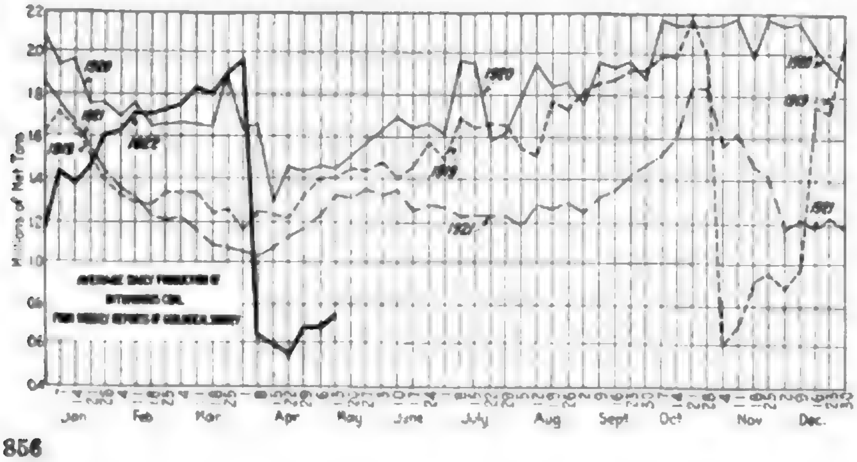
Production continues gradually to increase as the price goes up. There are many small mines, particularly of the wagon variety, that are reported to be ready to begin production of a few cars a week each of what will pass for coal when the price gets above $4.



BITUMINOUS

"Production of soft coal increased at the beginning of the sixth week of the strike," says the Geological Survey. "The early returns indicate an output of close to four and a half million tons. Production of anthracite, however, remains practically zero.

"The revised figures for the fifth week (May 1-6) show 4,161,000 tons of bituminous coal, and 6,000 tons of anthracite, a combined output of 4,167,000 tons. In the corresponding week of the 1919 strike 5,245,000 tons of soft coal and 2,014,000 tons of anthracite were produced, a total of 7,259,000 tons. The current output of all coal,



Estimates of Production

(Net Tons)

BITUMINOUS

	1922	1921
Apr. 22 (*b*)	3,575,000	6,815,000
Apr. 29 (*b*)	4,175,000	6,984,000
May 6 (*a*)	4,161,000	7,391,000
Daily average	694,000	1,232,000
Calendar year	148,691,000	134,542,000
Daily av. calendar yr.	1,396,000	1,264,000
ANTHRACITE		
Apr. 22	6,000	1,903,000
Apr. 29 (*b*)	5,000	1,945,000
May 6 (*a*)	6,000	1,633,000
COKE		
Apr. 29 (*b*)	89,000	76,000
May 6 (*a*)	90,000	70,000
Calendar year	2,395,000	2,920,000

(*a*) Subject to revision. (*b*) Revised from last report.

therefore, is some 3,000,000 tons a week short of the 1919 experience.

"For the first time since the strike began loadings passed the 13 000-car mark on Monday of last week (May 8-13). Yet the record of Monday was exceeded on each of the days following, and the returns so far received for Friday forecast a production of from 4,400,000 to 4,500,000 tons for the week. In comparison with the week preceding this is an increase of 9 per cent. The following table of cars loaded daily shows the trend of production:

	1st Week	2nd Week	3rd Week	4th Week	5th Week	6th Week
Monday	11,445	10,772	7,898	12,131	11,598	13,045
Tuesday	11,019	10,658	10,041	12,377	12,160	13,260
Wednesday	11,437	10,961	11,068	12 622	12,861	13,384
Thursday	11,090	11,482	11,193	12,981	12,487	13,234
Friday	11,296	10,714	11,596	12,362	12,778	
Saturday	8,888	8,501	10,194	11,295	11,265	

"At the end of the fifth week of the strike the accumulation of unbilled loads had been reduced to the level of March 4, two months before. The average number of coal loads unconsigned daily during the week ended May 6 was 13,959 cars of bituminous and 779 cars of anthracite. Compared with the week preceding, this was a decrease of 21 per cent for bituminous and 25 per cent for anthracite."

All-rail movement to New England declined during the week ended May 6, when 703 cars of bituminous coal were forwarded. Pennsylvania grades are now priced so high that this rail movement is mainly confined to contract shipments as New England is not yet in such need of coal that it will pay the going price for central Pennsylvania coals.

Dumpings at Hampton Roads declined to 344,432 net tons during the week ended May 11, as compared with 433,960 tons in the preceding week. The flow of coal to the piers has decreased because of the heavy demands from other sections made on the mining fields. The market stiffened a full dollar during the week.

TIDEWATER BITUMINOUS COAL SHIPMENTS FOR APRIL, 1922
(In Net Tons)

Destination	New York	Philadelphia	Baltimore	Hampton Roads	Charleston	Total
Coastwise to New England	42,000	7,000	16,000	807,000		873,000
Exports		13 000	16,000	246,000	27,000	302,000
Bunker	195,000	28 000	22,000	203,000	5,000	453,000
Inside capes		127 000	46,000	68,000		240,000
Other tonnage	406,000	1,000	2,000	266,000		675,000
Total	643,000	176,000	102,000	1,590,000	32,000	2,543,000

Lake dumpings for the season to May 1 were 834 533 net tons, compared with 1,289,160 tons in 1921 and 329,202 tons in 1920. April dumpings were 621,236 tons, compared with 204,040 tons in March. Recent dumpings are being shipped to Buffalo and other lower ports where there is an active demand for fuel, and the Head-of-the-Lakes docks, instead of getting additional cargoes, are reported to be receiving inquiries for shipment down the Lakes. During April upbound "Soo" passages were 109,000 net tons of soft coal and 5,000 tons of anthracite.

How the Coal Fields Are Working

Percentage of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Apr. 1, 1922 Inclusive	Apr. 3 to Apr. 29, 1922 Inclusive	Week Ended Apr. 29
U. S. total	45.6	55.7		
Non-Union				
Alabama	63.5	64.6	70.8	69.0
Somerset County	55.5	74.9	73.5	64.0
Panhandle, W. Va	55.3	51.3	33.8	40.8
Westmoreland	54.9	58.8	68.6	53.1
Virginia	54.8	59.9	69.0	83.2
Harlan	53.3	54.8	41.5	49.0
Hazard	51.7	58.4	54.4	55.2
Pocahontas	49.8	60.0	70.3	76.5
Tug River	48.1	63.7	74.0	83.6
Logan	47.6	61.1	68.5	73.3
Cumberland-Piedmont	46.6	50.6	10.7	17.5
Minging Gulf	45.7	64.3	65.6	73.4
Kenova-Thacker	38.2	54.3	71.1	83.1
N. E. Kentucky	32.9	47.7	56.5	59.3
New River‡	24.3	37.9	8.2	10.8
Union				
Oklahoma	63.9	59.6	17.6	15.0
Iowa	57.4	78.4	0.0	0.0
Ohio, north and central	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	0.1	0.0
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	10.3	12.0
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	11.9	11.9
Fairmont	35.3	44.0	3.9	3.8
Western Kentucky	32.5	37.7	32.1	59.3
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	1.0	2.1
Ohio, southern	22.9	24.3	0.0	0.0

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

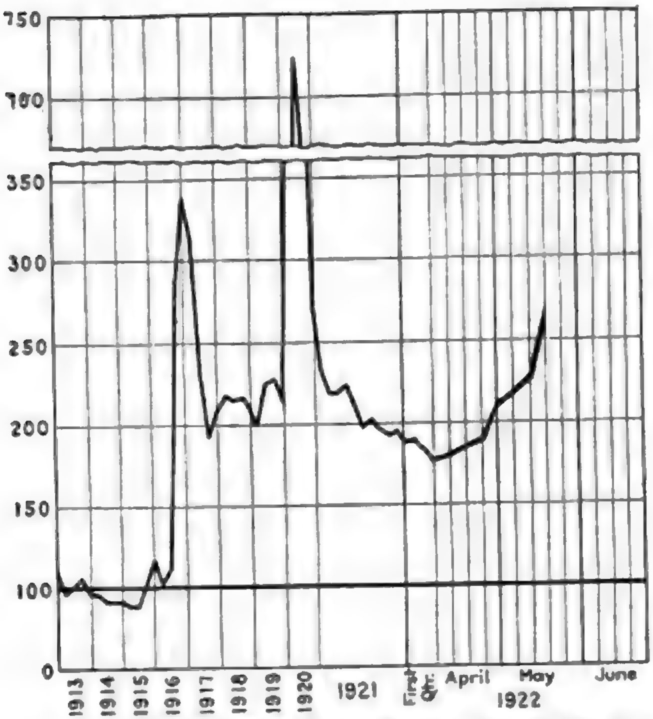
ANTHRACITE

Aside from a little coal dredged from the rivers, anthracite production continues at a standstill. There is next to no buying for the future by retail consumers and although yard stocks are getting low, the retailer turns a deaf ear to the meager offerings of replacement tonnage

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

	Market Quoted	Apr. 17, 1922	May 1, 1922	May 8, 1922	May 15, 1922†
Low-Volatile, Eastern					
Smoke'ess lump	Columbus	$2 85	$3 05	$2 85	$2 75@ $3 00
Smoke'ess mine run	Columbus	1 90	2 40	2 40	**2 75@ $3 00**
Smoke'ess screenings	Columbus	1 40	1 75	2 20	**2 75@ 3 00**
Smoke'ess lump	Chicago	2 50	2 75	2 90	2 75@ 3 00
Smoke'ess mine run	Chicago	1 65	1 95	2 25	**2 50@ 2 75**
Smoke'ess lump	Cincinnati	2 35	2 90	2 90	**3 00@ 3 50**
Smoke'ess mine run	Cincinnati	1 70	2 15	2 60	**3 00@ 3 25**
Smoke'ess screenings	Cincinnati	1 60	2 15	2 40	**3 00@ 3 25**
*Smokeless mine run	Boston	4 75	5 05	5 65	**6 50@ 7 00**
Clearfield mine run	Boston	2 15	2 60	3 15	**3 00@ 3 50**
Cambria mine run	Boston	2 55	3 00	3 50	**3 50@ 4 00**
Somerset mine run	Boston	2 25	2 80	3 40	**3 25@ 3 75**
Pool 1 (Navy Standard)	New York	3 40	3 75	3 75	
Pool 1 (Navy Standard)	Philadelphia	3 15	3 70	3 75	**3 75@ 4 10**
Pool 1 (Navy Standard)	Baltimore		3 75	3 90	**3 75@ 4 25**
Pool 9 (Super. Low Vol.)	New York	3 25	3 25	3 50	**4 25@ 4 50**
Pool 9 (Super. Low Vol.)	Philadelphia	2 75	3 30	3 40	**3 50@ 4 00**
Pool 9 (Super. Low Vol.)	Baltimore		3 40	3 40	**3 75@ 4 25**
Pool 10 (H. Gr. Low Vol.)	New York	2 75	3 00	3 25	**4 25@ 4 50**
Pool 10 (H. Gr. Low Vol.)	Philadelphia		3 15	3 20	**3 40@ 3 75**
Pool 10 (H. Gr. Low Vol.)	Baltimore		3 25	3 25	**3 50@ 4 00**
Pool 11 (Low Vol.)	New York	2 75	2 75	3 00	**4 00@ 4 25**
Pool 11 (Low Vol.)	Philadelphia	2 25	2 80	2 85	
Pool 11 (Low Vol.)	Baltimore	2 75	3 10	3 20	**3 25@ 3 75**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	2 90	2 70	2 70	**4 00@ 4 25**
Pool 54-64 (Gas and St.)	Philadelphia	2 15	2 50	2 65	
Pool 54-64 (Gas and St.)	Baltimore	2 90	3 00	3 00	
Kanawha lump	Columbus	2 30	2 90	3 15	3 00@ 3 25
Kanawha mine run	Columbus	1 60	2 65	2 65	**2 75@ 3 00**
Kanawha screenings	Columbus	1 50	2 00	2 20	**2 85@ 3 00**
W. Va. Splint lump	Cincinnati	2 00	2 75	2 50	**3 00@ 3 25**
W. Va. Gas lump	Cincinnati	1 75	2 75	2 90	**3 00@ 3 25**
W. Va. mine run	Cincinnati	1 90	2 40	2 70	**3 00@ 3 25**
W. Va. screenings	Cincinnati	1 70	2 20	2 50	**3 00@ 3 25**
Hocking lump	Columbus	2 65	3 05	3 15	3 00@ 3 25
Hocking mine run	Columbus	1 75	2 90	2 90	2 75@ 3 00
Hocking screenings	Columbus	1 50	2 15	2 25	**2 65@ 3 00**
Pitts. No. 8 lump	Cleveland	3 40	3 25	3 25	3 00@ 3 50
Pitts. No. 8 mine run	Cleveland	$2 35	$2 90	$3 00	**$3 00@ $3 45**
Pitts. No. 8 screenings	Cleveland	2.20	2 90	3 00	**3 00@ 3 45**
Midwest					
Franklin, Ill. lump	Chicago	3 45	3 45	3 45	**3 65@ 4 25**
Franklin, Ill. mine run	Chicago	2 75	3 00	3 00	**4 00@ 4 25**
Franklin, Ill. screenings	Chicago	2 75	3 00	3 00	**4 00@ 4 25**
Central, Ill. lump	Chicago		2 75	2 75	
Central, Ill. mine run	Chicago		2 75	2 75	
Central, Ill. screenings	Chicago		2 00	2 00	
Ind. 4th Vein lump	Chicago	3 15	3 15	3 15	
Ind. 4th Vein mine run	Chicago	2 50	2 50	2 50	
Ind. 4th Vein screenings	Chicago	2 25	2 25	2 25	
Ind. 5th Vein lump	Chicago	2 60	2 60	2 60	
Ind. 5th Vein mine run	Chicago	2 60	2 60	2 60	
Ind. 5th Vein screenings	Chicago	2 40	2 40	2 40	
Standard lump	St. Louis		3 15		
Standard mine run	St. Louis		2 75		
Standard screenings	St. Louis		2 75		
West. Ky. lump	Louisville	2 35	2 60	2 90	**3 00@ 3 25**
West. Ky. mine run	Louisville	2 00	2 60	2 65	**3 00@ 3 25**
West. Ky. screenings	Louisville	1.90	2 60	2 65	**3 00@ 3 25**
South and Southwest					
Big Seam lump	Birmingham	2 00	2 00	2 00	1 95@ 2 10
Big Seam mine run	Birmingham	1 70	1 70	1 70	1 50@ 1 90
Big Seam (washed)	Birmingham	1 85	1 85	2 15	*1 75@ 2 15*
S. E. Ky. lump	Louisville	2 25	2 75	2 90	**2 75@ 3 50**
S. E. Ky. mine run	Louisville	1 75	2 75	2 80	**2 75@ 3 25**
S. E. Ky. screenings	Louisville	1 55	2 75	2 60	**2 75@ 3 25**
S. E. Ky. lump	Cincinnati	2 15	2 90	2 60	**3 00@ 3 25**
S. E. Ky. mine run	Cincinnati	1 90	2 40	2 60	**3 00@ 3 25**
S. E. Ky. screenings	Cincinnati	1 65	2 25	2 50	**3 00@ 3 25**
Kansas lump	Kansas City	4 25	4 25	4 25	4 00@ 4 50
Kansas mine run	Kansas City	4 00	4 15	4 15	4.00@ 4.25
Kansas screenings	Kansas City	2 50	2 65	2 65	2.50@ 2.75

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in heavy type, declines in italics.
Note—Smoke'ess prices now include New River and Pocahontas.



Coal Age Index 261, Week of May 15, 1922. Average spot price for same period, $3.16. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh, Standard, Indiana and Central Illinois prices not included in figures for last week.)

at the high premiums quoted. Pea coal is still long, both at retail and wholesale. Steam grades are very scarce, with the exception of buckwheat, and one company producer is now conserving the supply of this size.

COKE

Beehive coke production showed a slight gain during the fifth week of the strike. The output was 90,000 net tons as compared with 89 000 tons in the previous week, a slight decrease in the Connellsville section being offset by increases in other districts.

The demand for coke is so strong that a large tonnage stored in New Jersey by the Seaboard Byproducts Coke Corpn. has been purchased by Pittsburgh steel interests.

Despite the coal strike the output of byproduct coke increased again in April. The total production for the month was 2,227,000 net tons, an average of 74,244 tons per day. In comparison with the daily average for March, this was an increase of 8 per cent. The month's production even exceeded the monthly average for any year prior to 1920.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES (a)
(Net Tons)

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,638,000	3,733,000
1920 Monthly average	2,565,000	1,748,000	4,313,000
1921 Monthly average	1,660,000	463,000	2,123,000
February, 1922	1,795,000	549,000	2,344,000
March, 1922	2,137,000	732,000	2,869,000
April, 1922	2,227,000	528,000	2,755,000

(a) Excludes screening and breeze.

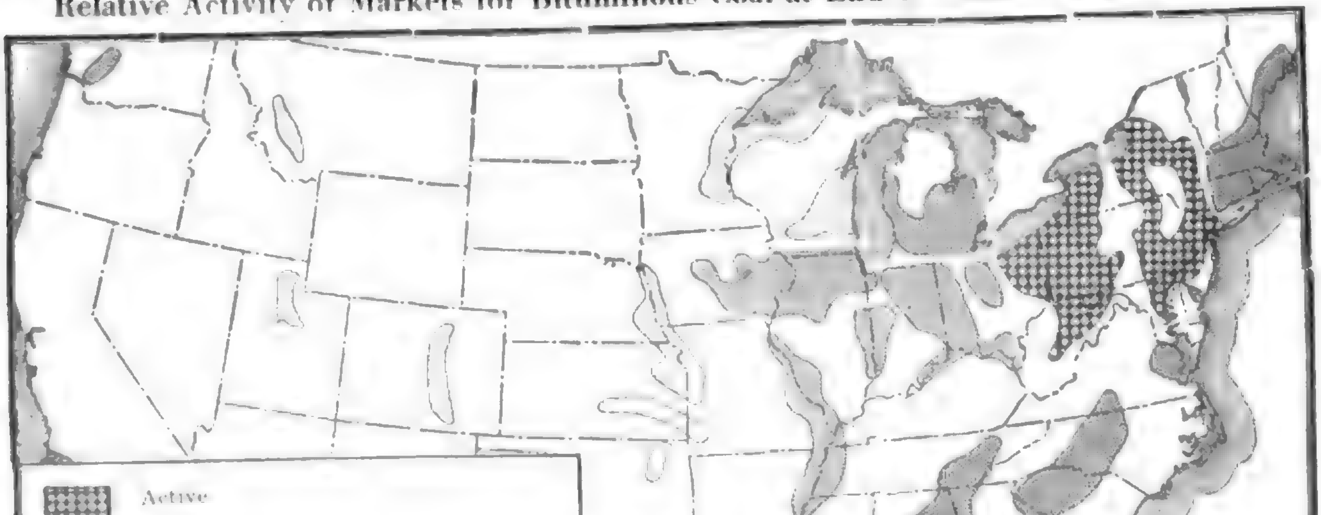
The monthly consumption of coal for coke manufacture has now definitely passed the 4,000,000-ton mark. In April, it is estimated, 4,033,000 tons were required by the ovens, an increase of nearly a million tons over the 1921 average. The market for coking coal is still far below normal, as seen from the fact that the present monthly requirements of the coke industry are only 57 per cent of those in the war period, and only 78 per cent of the average in 1919.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE
(Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly average	2,625,000	4,354,000	6,979,000
1918 Monthly average	3,072,000	4,014,000	7,086,000
1919 Monthly average	2,988,000	2,478,000	5,466,000
1920 Monthly average	3,684,000	2,665,000	6,349,000
1921 Monthly average	2,385,000a	731,000a	3,116,000
February, 1922	2,579,000a	866,000a	3,445,000
March, 1922	3,071,000a	1,155,000a	4,226,000
April, 1922	3,200,000a	833,000a	4,033,000

(a) Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in by-product ovens, and 63.4 per cent in beehive ovens.

Relative Activity of Markets for Bituminous Coal at End of Sixth Week of Strike



Foreign Market And Export News

British Coal Output Highest Since 1920; Export Market Conditions Improve

BRITISH production touched the high point for the year during the week ended April 29. The output was 5,160,000 gross tons, according to a cable to *Coal Age*, as compared with only 3,544,000 tons during the previous week, when production was curtailer by Easter holidays.

Information from the majority of the Welsh pits indicates that order-books are pretty well filled, while for some of the better classes of coal the supplies are not enough to meet the demand. Some urgent calls for the best classes of coal have been received from South America, though the quantities and origin of the calls are not so far disclosed. Other demands are being received from Italy, France and India, while calls from Central America are anticipated.

The certificate issued by the joint accountant for the audit of the South Wales coal trade for February indicates that, after deducting the owners' 17 per cent of profits, the percentage on the 1915 standard which can be paid by the industry amounts to 9.13 per cent, and that the surplus available is £46,043. During February profits were again too small to pay the minimum of 28 per cent above the standard. The owners have had to sacrifice their share of this surplus and also pay an additional £3,000; thus under the agreement terms they lose £284,000 during February.

In Scotland the trade is very much the same. There is no appreciable improvement in the home trade, though here and there slightly heavier demands are reported. The export trade is about the same with slightly increased demands from the Continent.

An encouraging feature of the Welsh trade is that the coal trimmers and trippers engaged at the Welsh ports have offered to work a full 8-hour day, and also to extend both daily shifts by a half-hour so as to allow a spell of 30 minutes for meals. The effect of this is to make available a full 16-hour day for coal loading, and conservative opinion estimates that this will permit a 15 per cent increase in exports.

Heavy Demand Cuts Supply at Roads

Activities dropped off last week, with dumpings about 25 per cent below the previous weeks of the coal strike, and with prices steadily moving upward. Movement of coal to New England was not up to normal, although bunker and export business was holding its own.

Increases started on high-volatiles, the supply of which has steadily diminished. It was followed by raise on all grades. Supplies of low-volatile coals are slightly diminished, and in other grades are far below normal.

Shipments to New York are moving fairly well. Active demand from other sections is reducing the pier supply, however.

Many union mines served by the Chesapeake & Ohio are not in operation, and supplies at Newport News are being cut down. Only to a very slight extent was this true of the fields in which the Norfolk & Western and the Virginian railways operate.

March Exports by Customs Districts

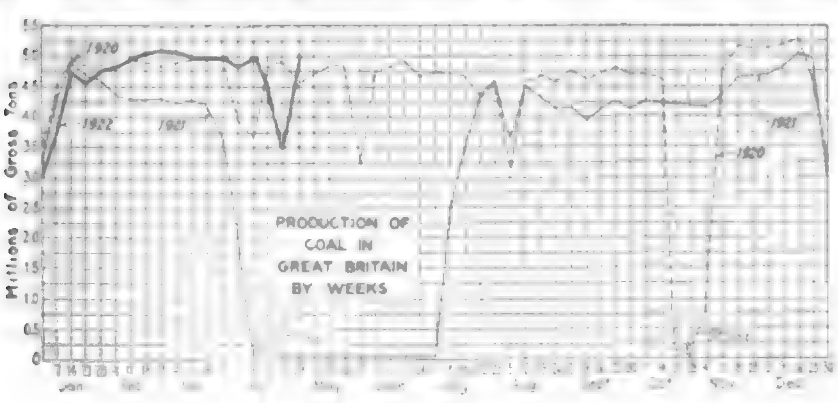
(GROSS TONS)	March, 1922
Maine and New Hampshire	1,124
St. Lawrence	287,217
Rochester	55,072
Buffalo	425,836
New York	64
Philadelphia	20,022
Maryland	19,339
Virginia	140,609
South Carolina	13,038
Florida	18,384
Mobile	673
New Orleans	1,315
Sabine	38
Galveston	2
El Paso	6,151
San Diego	12
Arizona	737
San Francisco	919
Washington	736
Dakota	1,953
Duluth and Superior	5,938
Michigan	153,085
Ohio	35,049
Total	1,187,313

Coal Paragraphs from Foreign Lands

ITALY—The price of Cardiff steam first is now 41s. 3d., according to a cable to *Coal Age*, a drop of 1s. from last week.

Imports for March were 2,006 tons from the United States, 614,000 from the United Kingdom, and 260,000 from Germany. Following the strike of the port laborers a large quantity of coal has accumulated at Genoa, causing a decline in prices, although British prices are firm on account of the American strike. The big decline in American coal is due to inability to meet British prices and credits.

GERMANY—Production in the Ruhr region during the week ended April 29 was 1,911,000 metric tons, according to a cable to *Coal Age*, as compared with 1,525,000 tons during the preceding week.



Hampton Roads Pier Situation

	Week Ended May 4	Week Ended May 11
N. & W. Piers, Lamberts Point:		
Cars on hand	2,141	1,367
Tons on hand	119,620	73,444
Tons dumped	201,641	166,089
Tonnage waiting	15,000	10,000
Virginia Ry. Piers, Sewalls Point:		
Cars on hand	973	1,084
Tons on hand	48,650	54,200
Tons dumped	122,391	90,558
Tonnage waiting	10,757	31,650
C. & O. Piers, Newport News:		
Cars on hand	642	602
Tons on hand	32,100	30,100
Tons dumped	63,433	50,882
Tonnage waiting	4,290	8,300

Export Clearances, Week Ended, May 11, 1922

FROM HAMPTON ROADS:

For Atlantic Islands:	Tons
Br. Schr. Thuro Queen, for Charlottetown	657
Am. S.S. Cristobal, for Cristobal	6,477
Nor. S.S. Hallgjerd, for Curacao	2,131
Nor. S.S. Belita, for Kingston	844
For Brazil:	
Br. S.S. Boswell, for Buenos Aires	2,291
Braz. S.S. Camamu, for Rio de Janeiro	6,226
For Cuba:	
Am. Schr. Anandale, for Cienfuegos	2,440
Nor. S.S. Christian Michelson, for Havana	5,544

Pier and Bunker Prices, Gross Tons

PIERS

	May 6	May 13†
Pool 9, New York	$6.25@$6.50	**$8.00@$8.50**
Pool 10, New York	6.15@ 6.35	**8.00@ 8.25**
Pool 9, Philadelphia	6.30@ 6.55	**6.55@ 7.00**
Pool 10, Philadelphia	6.00@ 6.35	**6.40@ 6.75**
Pool 71, Philadelphia	6.50@ 6.80	**6.90@ 7.30**
Pool 1, Hamp. Rds	5.30@ 5.80	**6.50@ 7.00**
Pools 5-6-7 Hamp. Rds	5.10	**6.50@ 7.00**
Pool 2, Hamp. Rds	4.95@ 5.15	**6.00@ 6.50**

BUNKERS

	May 6	May 13†
Pool 9, New York	$6.60@$6.80	**$7.50@$7.75**
Pool 10, New York	6.45@ 6.65	**7.25@ 7.50**
Pool 9, Philadelphia	6.50@ 6.75	**6.85@ 7.30**
Pool 10, Philadelphia	6.15@ 6.60	**6.80@ 7.00**
Pool 1, Hamp. Rds	5.90	**7.00@ 7.25**
Pool 2, Hamp. Rds	5.25	**6.40@ 7.00**
Welsh, Gibraltar	43s. f.o.b.	43s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon	43s. f.o.b.	43s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	43s. t.i.b.	43s. t.i.b.
Welsh, Messina	38s. f.o.b.	**41s. f.o.b.**
Welsh, Algiers	41s. f.o.b.	41s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Malta	44s. 6d. f.o.b.	44s. 6d. f.o.b.
Welsh, Las Palmas	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Port Said	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Alexandria	44s.	44s.
Capetown	35s. 3d.	35s. 3d.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	May 6	May 13†
Admiralty, Large	28s.6d.@28s.9d	**28s.6d.@29s.**
Steam, Smalls	19s.@20s.	19s.6d.@20s.
Newcastle:		
Best Steams	23s.@24s.	**23s.6d.@24s.**
Best Gas	24s.	*23s.@24s.*
Best Bunkers	22s.6d.	22s.6d.

†Advances over previous week shown in **heavy** type; declines in *italics*.

North Atlantic

Big Users Snap Up Output at Mines; Good Coal off Market

Quotations Rising Steadily — Pennsylvania Grades Scarce, Southern Fuels Flow In—Railroads Tranship Latter from New York.

BALTIMORE reports a general scramble for coal and an actual shortage of offerings. Good coal is practically off the market, as large users are snapping up all tonnage at the mines as fast as it is loaded. Prices continue their upward trend throughout this territory.

Pennsylvania grades are very scarce and the influx of Southern coals is the feature of the week. Early last week the price began to advance in sympathy with the stronger demand in other sections until Southern coal is now quoted on a basis of around $7, f.o.b. the Roads. Railroads are reloading this coal into cars at New York Harbor while at Baltimore it is being put into cars for transshipment to Pennsylvania rail points.

NEW YORK

With demand increasing the situation is not growing brighter. Cars at the local loading piers number about half as many as a week ago, while consumers who refused to add to their reserve stocks when coal was plentiful and prices low are now making numerous inquiries.

Quotations show more strength than last week but so far there has not been a tendency to go sky-high. Considerable of the Southern coal is being diverted to the West, which caused prices to advance. This increase was reflected here and also resulted in a stiffening of quotations for Pennsylvania coals.

Southern coals are not coming forward as heavily as a few weeks back. Quotations ranged $7.50@$7.75, alongside, although these figures were slightly shaded earlier in the week.

Some railroads are shipping Southern coals to this harbor and after reloading it into cars are sending it to points along their roads for their own use. Dealers who have coal ready for immediate shipment do not have much trouble in disposing of it if the price is right, the buyer not questioning to any great extent the quality. Hesitancy, however lost a cargo to many a consumer last week.

BALTIMORE

Careful reviews of the districts usually shipping to Baltimore show decreased production so that the entire situation shows a growing tendency toward tightness. Some of the Pennsylvania fields are running by paying bonuses and holding their men at work in that way.

With prices for even the poorest classes of coals running $3.75@$4.25, and best classes of steam coals almost impossible to secure, except on a new routing by water up the Chesapeake Bay from the Virginia connections, a genuine scramble is on for fuel protection. The production of high-grade steam has decreased to such an extent, that except on contract movement from producers who are determined to maintain regular customers' deliveries if possible, there is no outside offering of moment.

Following a few considerable shipment of New River and Pocahontas coals from Hampton Roads, has come a fairly steady stream of ships, and barges, principally with Pocahontas. One active dealer here leased a city pier on the harbor front in the heart of the business district and has been barging in large quantities of Pocahontas. Some of the coal dumped on the municipal pier by this shipper has been used by local consumers who carted from the pier, and some has been hauled for transshipment to Pennsylvania rail points.

CENTRAL PENNSYLVANIA

The strike situation at the close of the sixth week shows no unusual developments. The U. M. W. is still actively engaged in organizing the miners who remain at work. During the past week the miners of Nos. 1, 2 and 3 of the Consolidated Coal Co., at Myersdale, Somerset County, were organized.

The entire field produced 2,437 cars during last week as compared with 2,245 cars the previous week. Prices have advanced. Pool 10, one of the leading coals of the field, is now bringing $3.50 at the mines. The demand for coal is on the increase from line points.

UPPER POTOMAC

Material improvement in conditions in the Upper Potomac is seen, with about half of the mines in operation. Additional mines are resuming operations every day. Pools 10 and 11 are bringing $2.75@$3. Although men in the Georges Creek field are becoming more anxious to return to work, there has been no general break away from the union so far.

PHILADELPHIA

Another strong upward price movement is in evidence. It takes much effort to locate small lots of Pools 1 and 9, and many houses simply do not quote on grades of this kind at all.

Toward the latter part of the week there was just the least sign of easier conditions, not due to any increased production but to the fact that consumer interest decreased. Much capital was made of the report that a meeting was to be held by the President to discuss strike conditions and this was interpreted by the public as meaning a possible end of the trouble.

Many consumers are speaking strongly in favor of a seasonal freight reduction which has been so much to the fore recently. It is really remarkable even under the present scarcity of coal how the buyer is still inclined to limit necessary purchases predicated on a reduced freight in the near future.

There is practically no coal being loaded for export at the piers, as it is a rare thing these days to have a cargo clear. For such bunkering as offers the demand is easily met.

FAIRMONT

Steady gains are being recorded in the number of mines at work. Many of these are smaller mines which have been out of commission for a year and a half. Mines in the larger communities are not in operation. Miners are becoming restless, however, owing to a shortage of funds and lack of relief accorded them and are now seeking work in mines where they are not known. The demand is in excess of the supply.

South

BIRMINGHAM

A considerable quantity of Alabama coal has been sold for shipment through the Memphis gateway during the past week, principally for railway use, the Missouri Pacific placing orders for 20,000 tons, prompt shipment, and the Mobile & Ohio for some tonnage. Inquiries were also received from industrial consumers and domestic dealers in the West. With the exhaustion of present stocks and the continuation of the strike Alabama will shortly be called upon to supply consumers who will be cut off by the movement north and west from Kentucky and West Virginia.

Several thousand tons of coal moved to seaboard the past week for shipment to South America. The coke market has developed strength in the past week or two. a heavy tonnage going into the St. Louis and Kansas City territory and several thousand tons were exported. Railroad contracts closed recently called for approximately three million tons for delivery during the next twelve months.

Domestic mines are having some trouble in disposing of the output, although production is on a limited scale. Prices of steam coal have not been affected by increased business and more active inquiry so far and are shown in the Weekly Review.

Production is on a basis of about 275,000 tons per week. Railroads having contracts in the district are not stocking any coal at present and in most cases are only taking the minimum contract requirements. The Southern Railway has been short on equipment the past week, curtailing the output at some of the mines it serves.

VIRGINIA

At no time since late in 1920 has production been on so large a scale. Nearly 83.2 per cent of capacity is being produced. In the section served by the C. C. & O. it is 94 per cent. Coke production, however, is somewhat limited. The larger output is due to an expansion of the markets into which Virgina coal goes, some being consigned to the Pittsburgh steel center, for the first time in the history of the field.

Anthracite

Weather Aids, Winter Price Schedule Retards, Demand

Yard Stocks Gradually Fade—Premium on Independent Offerings Limits Trading—Buckwheat Moving Better; Plenty Still to Be Had—Lake Market Inactive.

BACKWARD spring weather has prolonged a little current demand. No one will buy in quantity, however, with the full winter retail schedule in effect. Yard stocks are going down very gradually and dealers are in good position to refill when new mining conditions become effective. Some independent coal is still offering in small lots, but the premium is too high and trading is very light.

Buckwheat is practically the only steam size available and there is some betterment in the demand for this by the anthracite railroads. The scarcity of soft coal is moving more buckwheat, but there is still plenty of this tonnage available, and stocks will stand a heavy drain. The Lake market remains inactive, both at the lower ports and at the Head-of-the-Lakes.

BOSTON

For the most part, dealers are marking time. The householder who is putting in next season's coal is very much the exception; the public as a whole seems not interested.

City dealers have moderate stocks for several weeks to come at the present rate of delivery but a rush on the part of consumers would absorb present reserves in a comparatively short period. A few retailers in country places are out of certain sizes already and are making inquiry for deliveries "when mining is resumed."

One small but significant move is the advance in Boston at retail of pea coal, the new price being $12, effective May 13. The previous figure was $10.50.

PHILADELPHIA

The backward spring serves to give the retailer some little business, but this is not sufficient to create any real activity. While some yards are almost entirely out of stove and nut, there are others who claim at the present rate of movement to have sufficient to carry them to July 1.

With the full winter retail schedule prevailing no one wants coal in quantity. The lack of demand, even by the retailer, is shown by the offer of some storage chestnut by local brokerage houses. This is freely offered at $8.50, occasionally at $8.40, yet sales are few.

Much of the correspondence of shipping houses these days is from customers inquiring as to the duration of the suspension, which is generally met with the stereotyped answer that no one knows.

There are some signs of betterment in the steam trade, which really means buckwheat coal, as barley is all gone, and rice almost so. The soft coal situation is beginning to make just the slightest impression, and the anthracite railroads seem to be making heavier requisitions.

BALTIMORE

The hard coal situation is at a standstill. The only feature is that more and more of the smaller yards are running out of supplies. Dealers here who figure that the strike will go on for at least another month, are beginning to have serious doubts of the ability of local retail handlers to meet the rush conditions that are bound to come on next fall.

BUFFALO

Some of the largest distributors have no coal at all and are merely sending out circulars, soliciting orders, to be filled when new coal comes in. Consumers generally have what coal they expect to need until mining is resumed. The idea seems to be that prices will be lower then.

Some effort has been made to sell the steam sizes that most operating companies have on hand, but the demand is small. It appears that manufacturers are able to get what bituminous they want and do not care for anthracite at any price.

Some independent anthracite is moving, but the demand for it is even lighter than for regular coal, for the premium on it is a dollar or so, with some concerns asking more.

ANTHRACITE FIELDS

Conditions are still quiet in the region. Many workers would agree to go back at the old scale and a few would be willing to take a small cut in wages. In parts where work was not so plentiful last year the men are feeling the suspension badly. Restlessness seems to be increasing on the part of the men, who apparently feel that a contract should either be signed or else a regular strike be declared. There is a growing feeling, however, that an early settlement would be more desirable than the declaration of a strike.

NEW YORK

Dealers are beginning to enter the buyers' market. Their stocks are being rapidly depleted, and with no indications that the miners will return to work shortly it is becoming more apparent that New Yorkers will soon realize that production is at a standstill.

The supply of stove is nearly exhausted with wholesalers as well as retail dealers. There are small tonnages of egg and chestnut to be had, most of which is in boats but so far there has not been any urgent demand for these coals.

Pea coal is about the only size producers have in stock. Conditions have not yet become serious enough where consumers are willing to take this size rather than go without. Quotations heard for domestic coals are generally on the alongside basis.

Steam coals are not moving quickly. At least one company is conserving its supply of buckwheat. Quotations for rice in some quarters ranged $5.50@$5.75, alongside, and barley was about $1 less.

Coke

UNIONTOWN

A substantial gain in the movement of coal and coke in the Connellsville region is shown for the week ended May 13. Coal shipments were 2,084 cars as against 1,808 the previous week. Coke shipments were 1,015 cars compared with 979 the previous week. The output of the region for the week may be estimated at 103,700 tons of coal and 50,750 of coke.

Generally the strike situation itself has shown no material change. On Monday the Calumet mine of the H. C. Frick Coke Co. resumed operations, marking the first break of any proportion in the strike. Several acts of violence also marked the week.

The market is steady and rising but not feverishly. The report of coal reserves created by steel interests in the Pittsburgh district from West Virginia and Kentucky fields have had a heartening effect. Grades of steam coal are quoted at $3.10@$3.25 and byproduct $3.25@$3.40.

CONNELLSVILLE

Connellsville furnace coke is up 25c., being quotable at $6.50, foundry coke being unchanged at $6.75. Offerings are very light for both grades, but demand is also light. It is only in exceptional circumstances that a blast furnace will buy coke at anything like current prices, while other consumers, who buy only an occasional carload, do not count cost so carefully.

Production is running at about one-third the rate of March, with no prospects of any material change in either direction in the next few weeks. For furnaces normally tributary to the Connellsville region coke is being obtained from unusual sources, including Alabama, while the byproduct ovens that ordinarily use Connellsville coal are drawing from several fields, including those in West Virginia and Kentucky. The Carnegie Steel Co., which was operating 34 blast furnaces April 1 and 32 in the past few weeks, is resuming operations at two Mingo stacks.

The *Courier* reports production in the week ended May 6 at 38,500 tons by the furnace ovens, and 13,700 tons by the merchant ovens, making a total of 52,200 tons, a decrease of 2,030 tons.

BUFFALO

The trade is not much more than nominal, as the beehive ovens have practically no coke to sell. Local furnaces are running more actively than they were, but they are pretty well supplied. When they do give out an order they pay $6.50@$7 for 72-hr. Connellsville foundry $5.50@$6 for 48-hr. furnace and $4 for stock.

Chicago and Midwest

Railroads Plan Pool To Buy Coal For Them

Scheme Is Expected to Protect Lines Against Skyrocketing Prices — All Quotations Climb Steadily—Fields in West Have Few No-Bills Left.

THE most important development in the Midwest region during the past few days, from the coal marketing standpoint, was the opening of negotiations among railroads which will result in the formation of a sort of buying pool. By a method yet to be worked out the railroads hope to go quietly into the Kentucky and Eastern fields and buy regularly and in moderate quantities during the remainder of the strike period. They are working out their plan in self defense against skyrocketing prices, believing that those roads which have been buying more or less openly during the past ten days through regular channels, are partially responsible for the hike prices Kentucky coals have taken.

Kentucky continues to play the leading role in the Midwest. Its eastern non-union fields and its western fields that are still paying the union scale under an agreement running the rest of the year, are producing heavily and selling at practically their own figure. In both cases little sizing is done, unless buyers insist upon it—and pay for the preparation. Quotations in both fields at the end of last week were about the same, running around $3.25 for mine run. In the case of western Kentucky, this represented an increase of 50c. or more above the price of the week before and the level was constantly ascending.

Demand for these coals, while not keen around Chicago, is better than it was a week ago when the prices irritated buyers in that district to such an extent that they refused to get interested, and as a result, a good deal of western Kentucky coal got into distress and was unloaded at a loss. The congestion has all been absorbed and many sales of small lots were going at $3.25@$3.50 at the close of last week. The only big deal reported near Chicago was that of a public utility which took 300 cars at $3.35. The flow of Kentucky coals north has been steady and growing for two weeks so that the operators are happy, even though many of those in the western end of the state are condemned generally by buyers for unprincipled tactics and for cupidity which may bring down Government intervention.

Indiana and Illinois fields are cleaned out except for a little sized coal in Franklin County and a moderate quantity of steam sizes in the territory just east of St. Louis. The prices on these fag-ends have risen noticeably.

Domestic trade amounts to almost nothing. A few dealers are taking a little fuel, especially smokeless lump, which they expect to hold for a class of household trade which ordinarily buys anthracite in August and September.

CHICAGO

A slight freshening of the market was noticeable during the past week. A number of concerns actually were busy selling coal for the first time since the miners struck. This does not mean that the market is strong. It simply means enough buyers were in for small quantities to interest several of the much reduced selling staffs, indicating that disappearing stocks in the yards of big consumers and public utilities are drawing more and more purchasing agents back into action.

Most of the trading nowadays is in Kentucky coals, though a little smokeless dribbles into this market regularly at a slightly improved price. Smokeless lump has not passed $3 but mine run has picked up a little and can hardly be bought under $2.50 at any time. Kentucky fields are making money, evidently, and there now seems to be sufficient demand in this region for western Kentucky mine run, even at the stiff price of $3.35, to prevent a recurrence of the congestion of distress coal from that field which afflicted Chicago ten days ago when coal bought at the mines for $2.60@$2.75 was sold here for as low as $2.35.

The swift and steady rise of this fuel is causing a good deal of apprehension here. Many observers of the coal trade feel that if the climb continues it will invite Government intervention in the strike. Eastern Kentucky coal is quoted just as high. It is pointed out, however, that the price is still 25c.@50c. below that fixed as fair by the Garfield fuel administration.

Southern Illinois coals will figure in the market for only a few days more. At the close of last week there were less than 500 cars of no-bills available of which only a handful contained screenings for which owners were trying to get at least $4.25 and the balance was sized coal selling in small lots all the way from $3.65, which was the top price for all of April and part of May, up to $4.25. Northern Illinois Springfield district and Indiana fuels are out of this market. Thero remains some Mt. Olive and Standard district coal, however.

SOUTHERN ILLINOIS

Practically all the coal in the Williamson and Franklin County field is cleaned up. Conditions there and in the Duquoin and East Jackson County fields are quiet, with the exception of a little disturbance reported near Johnston City. In the Mt. Olive district some commercial coal is still on hand and considerable railroad coal is moving out.

There is still considerable coal left in the Standard district especially at mines near East St. Louis and Belleville. It is being loaded out partially by truck.

ST. LOUIS

A few plants in this region are getting into their storage coal and are inquiring about some future supplies. The railroads are buying a little, especially the Wabash, Frisco and Terminal. There are still several thousand tons of coal in St. Louis in storage. There is at the mines in Illinois within trucking distance several thousand tons of steam sizes and several thousand tons additional are stored at mines in Illinois. But the demand right now is insignificant.

The methods of the west Kentucky operators are astounding St. Louis coal men. Many of these shippers repudiate their earlier sales in order to handle the higher priced ones that come in later. Some of the coal coming into the St. Louis market is the commonest kind of junk. A week ago western Kentucky mine run was $2.50. Now it is $3.50 with lump $4@$4.50. These tactics are the sort that call for government interference.

LOUISVILLE

Prices have advanced about 50c. a ton on some grades of coal in the state over the week end. Producers quote only on immediate delivery. Better buying of railroads, steel, utilities, etc. is noticeable, most of the demand coming from the North. There is practically no Southern business except on railroad fuel.

Coal prices start at $3 in western Kentucky for screenings and mine run, while in eastern Kentucky some mine run is quoted at $3.25, and some lump $3.50@$3.75. Lake movement is picking up steadily, and numerous orders are coming from Chicago, Detroit, Youngstown, Cleveland, Columbus, and inquiries from as far as Buffalo, Pittsburgh and Philadelphia.

INDIANAPOLIS

Indianapolis industries, domestic consumers and public utilities are supplied with coal sufficient to last until cold weather. There is some inquiry, but little actual demand. The Pennsylvania, with its five divisions out of Indianapolis, appears to be the hardest hit. Officials of the road say they have 25,000 tons on hand and about 600 cars on one division, but the company apparently is in the market.

WESTERN KENTUCKY

Western Kentucky after losing money most of the past six months paying peak prices for labor, and selling coal in competition with the 1917 scale of wages in eastern Kentucky, today is "sitting pretty" and getting business. In spite of the fact that western Kentucky is still paying the peak scale, under the pre-strike contract with its miners, whereas the eastern Kentucky non-union field is on the 1917 basis, prices have advanced sufficiently to allow western Kentucky to compete.

Some complaint has been heard concerning operators who fail to fill old orders. Most operators went into the strike period with very little contract or old business, and have refused to accept business for more than a week or ten day period at most. Many are taking orders practically from day to day thus keeping up with the market all the time.

Northwest

Upper Lake Territory Calm and Indifferent

Coal Consumers Show Little Interest in Fuel—Prices Remain Sweet and Low—Shipments to and from Docks Far Lighter Than Normal.

THE Northwest remains generally indifferent to the strike. Prices are still soft and give no indication of stiffening as they have done in almost every other section of the country. Industry is not forging ahead. Many development plans have been laid aside awaiting some sort of settlement both of the differences of opinion between miners and operators and of freight rates.

Some immediate encouragement may have been given to those who confidently expect freight rates to go down by the reductions lately put into effect on coal from some of the Wisconsin docks to Inland points. Already a protest against this reduction has been formulated by traffic organizations in Illinois who claim it is unfair to all-rail coal.

MILWAUKEE

Little can be said of the coal market, other than that it is practically dead. What movement there is is confined to soft coal, of which there is no shortage as yet. The anthracite situation is more tense, but there is little of this coal consumed at this time, and nobody is ordering for future delivery.

Buyers in the Eastern soft-coal fields report a tendency to stiffen prices. But a reduction was made here during the past week of 50c. per ton on Eastern soft coal and also on smokeless from West Virginia. Pocahontas mine run for steaming purposes sells at $7 per ton and screened Pocahontas at $10. Pittsburgh and Youghiogheny coal for domestic use is listed at $8.75, and for steam at $7.50.

Coal arrivals by Lake during May thus far number seven cargoes of soft coal, aggregating 48,634 tons, making the receipts this season 8,000 tons of anthracite, and 148,943 tons of soft coal. Last year during the same period 139,522 tons of anthracite, and 303,190 tons of soft coal were received over the docks.

DULUTH

Fears of a cut in railroad rates have far outbalanced any fear of a coal shortage at the Head-of-the-Lakes, and buyers are holding off consistently for the drop which they know must come if the railroad reduction materializes. The coal trade here is distinctly in the doldrums.

The general industrial situation is not promising, as many concerns which announced their openings, have withdrawn their announcement pending the settlement of the coal strike. This does not apply to the steel industry at Duluth, which has already contracted for its coal.

Bituminous tonnage on docks as of May 1 is placed at 2,841,189, a decrease of 334,000 tons from figures of April 1, and anthracite is at 416,464 tons, which is but 12,986 tons less than at April 1. Since the figures were compiled 61,000 tons of soft and 5,000 tons of hard coal have been received.

The bituminous market is weaker than at any time since the first of the year. Prices are $6.50 for lump, $6 for run of pile and $4.25@$4.75 for screenings. Although this represents a drop of 50c. from the list, some docks are shading even further to obtain orders.

Reports still persist that a ship will load at Duluth within a few days for South Chicago, marking the first shipment of coal from the Head-of-the-Lakes to a point nearer the mines.

MINNEAPOLIS

If the striking miners thought to frighten anyone into frantic appeals for fuel, their hopes have not been in the slightest successful in this territory. Consumers seem to be entirely oblivious to there being any such thing as a coal strike.

Prices are weak and uncertain. There are some intimations that a little tonnage is being placed now and then, quite secretly. Railroads are understood to be adding a little to their contracts, where it can be done without publicity. The sentiment seems to be that as a reduction is almost certain to follow the adjustment of the mine wage difficulties, it may be as well to get prices down now. However, this does not stimulate business.

The industrial requirements continue to be light. The flour mills and electric light and street railway plants which have water power, have been able to keep their steam plants running at a very low rate. Other industrial requirements have been considerably less than normal.

Stocks of soft coal on the docks will serve for several months without difficulty, but might leave the docks bare in the fall if a rush comes from all directions. Then it would be too late to restock in sufficient quantity for the following winter. But no one seems to worry about what will happen next winter.

One thing which tends to make everyone wait that possibly can, is the recurrence of hints that freights are about due for a reduction. Whence these rumors come, is not clear, and whether there is anything in them is equally uncertain. But they exist, and many people listen carefully and obey them.

New England

Roads Call Equals Supply; Prices Make Rapid Advance

Rise Is the Sharpest New England Has Seen in Two Years—Distress Coal in Harbor Cleaned Up—Spot Demand Negligible, but Buyers May Be Stampeded.

HAMPTON ROADS demand has overtaken the supply and prices have advanced rapidly. New England quotations have risen more rapidly than at any time during the last two years. Prices will continue to advance and will be limited only by the amount certain buyers will pay.

Distress coal in Boston Harbor has been cleaned up, and although there is no particular spot demand, it is quite possible that the rising market will scare some buyers into taking more coal. The West and New York seem to be bidding for the current smokeless output and this indicates a smaller movement here in the near future. Central Pennsylvania coals are so scarce and high-priced that but little tonnage is coming in.

The past week has shown a succession of rapid advances such as we have not seen for nearly two years. On May 10 sales of Pocahontas were reported at $5.90 per gross ton f.o.b. vessel at Norfolk, while the next day there were few quotations at less than $6.50. At this writing $7 is rumored and $8.50 has been quoted on cars Boston for Inland distribution. There is trade comment on the effect this flurry is likely to have on organized labor at a time when there is a strong public sentiment in favor of reduced prices.

There is no question now that demand at Hampton Roads has overtaken supply. Apparently there is an active enough market in the West to keep prices very firm and there is also a more or less insistent demand on the part of Pennsylvania shippers who have commitments in New York Harbor. It seems a clear case of the West and New York bidding against each other for current output in the smokeless region.

Pennsylvania production is extremely light, and quotations range much higher all along the line than was the case a week ago. Very little tonnage is dribbling through all-rail, but here and there shippers are offeringing scattered lots for shipment to the Philadelphia and New York piers.

"Distress" coal in Boston Harbor has now been absorbed and while current quotations are on a much higher level there is no particular demand for spot coal that will send prices up as fast as they have advanced at the Roads.

It is likely coastwise movement to New England will fall off materially. A medium large tonnage will of course continue coming forward on contracts, but spot sales probably will for the present be rather few in number.

Eastern Inland

Buying of West Virginia and Kentucky Coals Livens Market

General Demand Better, with Steel Mills and Railroads Heaviest Takers—Market Trends Steadily Up, Receipts Gaining Daily—Lake Coal Travels New Routes.

HEAVY buying of Kentucky and West Virginia non-union coals has made an active market. The steel industry and railroads are the heaviest takers but the general demand also is more brisk as business continues to recover and buying for replenishment of stockpiles is growing. The production of steel increased during April, despite the curtailment of fuel supplies, caused by the strike. The trend of the market is steadily upward and receipts are now increasing daily.

Lake coal is moving over new and unaccustomed routes. Caused by the industrial demand at Buffalo and other lower ports, the Cross-Lake movement of coal has temporarily stopped coal traffic up the Lakes.

CLEVELAND

Indications of a brisker demand for coal are becoming clearer as business recovery becomes more pronounced and stocks of fuel dwindle. At the present time it is estimated that 65 per cent of the mines in the non-union districts in the Central West are producing. As demand grows more keen and prices increase this ratio will be increased, it is believed.

Little coal is coming into the ports east of Sandusky. The loading for the first nine days of May was much smaller than the corresponding period of last year. The bulk of the coal loaded at lower ports is being diverted to Buffalo. As a result of the increasing movement the vessel rate has been advanced from 32c. to 40c. from Toledo and Sandusky to Buffalo. Coal is not going forward to the upper ports any more freely. Last week shipments were 292,000 tons against 587,000 in the same week one year ago. For the season up to May 8 the docks loaded 1,095,523 tons against 1,850,000 tons in 1921.

Coal buying in this district is confined to steel mills and the railroads. Three large steel plants in Cleveland are getting substantial tonnages of West Virginia and Kentucky coal for coking purposes.

COLUMBUS

With the demand for all grades and more especially mine run and screenings growing stronger, prices are gradually advancing. Non-union coal is coming in large quantities and this takes care of the current demand.

Retail trade is slow as the summer has finally arrived. Retail prices have advanced in sympathy with the higher mine prices.

The larger part of the industrial demand comes from iron and steel plants. A considerable tonnage of Pocahontas mine run is now coming into Columbus territory and New River coals are also coming in large quantities.

Railroads are now coming into the market and some of the larger producers are trying to get in on railroad contracts. The Lake trade looks brighter than earlier in the season.

EASTERN OHIO

That a brisk buying movement in non-union coal is now under way is evidenced by the increased shipments that are reaching this section. The larger industrials and railroads are replenishing stocks, and a number of concerns, which had only a sixty-days' supply of fuel on hand at the beginning of the strike, are in the market, picking up coal here and there.

Cross-Lake shipments are being made to bolster up weak spots in coal reserves at industrial centers on the Lower Lakes, thus indicating that West Virginia and eastern Kentucky non-union coal shipped to lower docks originally intended as Lake cargo for the upper parts is moving over new and unaccustomed routes to buyers.

All non-union mines in eastern Ohio continue down and some of the wagon mines employing union labor, which were permitted to continue operations for the purpose of supplying public utilities, have been ordered closed because of alleged furnishing of coal to consumers other than public utilities. However, eastern Ohio stripping mines, with a potential capacity of 50,000 tons per week, continue to operate and are producing between 30,000 and 40,000 tons. Spot prices have stiffened slightly during the week.

Bituminous coal receipts at Cleveland during the week ended May 6 show a substantial increase over the preceding week and are now estimated at 75 per cent of normal requirements. Arrivals were the heaviest since April 1. Total cars received were 1,141. The quantity of coal now available in the open market, coupled with reserve stock on hand, has been ample to meet all demands, notwithstanding increased industrial activities.

DETROIT

Apparently the Detroit buyers continue to view the mine workers' strike complacently and without alarm concerning its possible effect on fuel supply. Business continues very light and it is difficult to interest customers to a buying point. With improvement extending in business and industrial lines, the seeming indifference of steam coal users is explained by the fact that many of them still have reserves of considerable proportions.

The domestic trade is flat, with retail dealers doing no buying and worrying lest a reduction in freight rates may place them in a position where they will have to take a loss on stocks on hand.

Pocahontas lump and egg is quoted \$2.75@\$3 at the mines, run of mine is \$2.40@\$2.50, nut, pea and slack, \$2@\$2.25. West Virginia lump is \$3, run of mine, \$2.50@\$2.65, nut, pea and slack, \$2.25. Eastern Kentucky run of mine is \$3.

PITTSBURGH

The monthly report of the American Iron and Steel Institute indicates that production of steel ingots in April was at the rate of about 36,500,000 tons a year, against a rate of 32,500,000 tons in March, when even the March production was the highest since November, 1920. The steel mills have been active buyers of coal in various non-union districts, not merely for early deliveries but for extended periods. The latest transaction reported involves the purchase of 200,000 tons of Pocahontas by the Jones & Laughlin Steel Co. There has been free buying of Kentucky coal, while it is understood that a good sized tonnage of coke has been bought in Alabama for water shipment north to various blast furnaces.

Connellsville coal has advanced farther, on account of buying demand from the East, for New England and for a large steel interest at Baltimore. Connellsville steam coal is now \$3.25@\$3.50, fully 25c. advance in the week. Buying of Connellsville coal by local and valley steel interests has been lighter in the past three weeks than formerly.

There have been no production decreases in the past two or three weeks, and it seems altogether improbable that the striking will spread any more. The non-union strikers are staying out much better than was expected, considering that they have not had the practice in striking the regular members of the U.M.W. have had in the past quarter century.

BUFFALO

The state of the trade naturally favors some advance in prices. The advance is a dollar or so, which the mining districts began to ask very soon after the strike started.

The real strike test is of no pay on one side and no coal on the other, so it is going to be some time yet before anybody gives in. It is reported that non-union mining is increasing in some parts of the Allegheny Valley. Sales are apparently as light as ever. Consumers have considerable coal yet and are not alarmed. Business improves slowly. The iron furnaces are apparently most active, but they are getting their coal by Lake at a low figure and are out of the general market. Ten such cargoes arrived last week.

A fair quotation is \$4 for Youghiogheny gas lump (next to none in market), \$3@\$3.50 for Pittsburgh and No. 8 steam lump and \$2.50@\$3 for all mine run and slack. To this add \$2.36 to Allegheny Valley and \$2.51 to other coals for freight.

NORTHERN PANHANDLE

All except two mines are in operation, the two mentioned being in Triadelphia District. In some sections trouble has been and is being experienced in preventing interference with the men who will work but upon the whole operations are satisfactory.

Cincinnati Gateway

Improvement in Buying Injects Vim Into Market

Smokeless Prices Up with Strong Call from Tidewater, Steel Mills and Railroads—Car Movement Unprecedented, but Demand Is Even Heavier.

STRONGER buying all around has made this market very lively. Smokeless coals have ascended as the Tidewater call is strong, steel mills are ordering heavily and railroad buying is on the increase. Tonnage is getting scarce and many shippers are booked up past June 1. Car movement from southeastern Kentucky is daily making new records, but demand is keeping about two leaps in advance of the heavier supply.

Pocahontas tonnage is the heaviest on record and is still gaining. New River is in better condition and more mines have resumed. High-volatiles are in strong demand at Tidewater and prices have been brought to the general range of $3@$3.25, which now prevails on all coals.

CINCINNATI

Demand is such that at the present time little thought is given to sizings, preparation or quality. There is in prospect a lot of haggling over shipments that will have to be threshed out at a different time, for there is no great care exercised to see that sales specifications are being carried out.

The strengthening Tidewater price of smokeless was reflected by an advance here, with a $3@$3.25 price range prevailing on all coals. The steel people too are coming in stronger and this has sent the price sky-high with more orders in the market than there is coal to fill them.

In the bituminous line there is a much scrambled situation. The lake buying, which was first to tilt the prices upward has not let down in the least. The higher the price, seemingly, the greater the interest and buying orders. Added to this is active buying on the part of another big railway system, which gives an outlet to the splints. Southeastern Kentucky is pouring coal through this funnel at a rate that creates a new record movement every day.

Retailers are talking of advancing the price of smokeless now that the wholesale price has advanced to $3.25 and their supplies are more uncertain. Some of them are making for the price $8 for lump and $7 for run of mine, an upward tilt of 50c. Bituminous lump is still quoted $6.50 and screenings at $5.

SOUTHEASTERN KENTUCKY

Demand is good and prices a little stronger. Production is averaging around 80 per cent of potential capacity. The loss is partly car shortage, some little labor trouble at union strongholds and labor shortage at mines that have been down for a long period and recently starting up.

Mine run is the go, very little prepared being made. Demand is now coming from a larger variety of users, while the first three or four weeks of the strike most of the coal went to steel plants and railroads.

LOW-VOLATILE FIELDS

New River and The Gulf

The tide appeared to be definitely turning in favor of the New River operators during the early days of May when a number of locals of miners, after holding a series of meetings, signified their willingness to return to work. The opinion is expressed that before the end of May, most of the mines will be in operation again. Market conditions are helpful in making a resumption of operations possible.

By the end of the first week of May, there was little to indicate that the strike had affected the Winding Gulf field in any way. Production was ranging above 25,000 tons a day. There was a somewhat better demand than had previously existed for Gulf coal.

Pocahontas and Tug River

Pocahontas production is on an unprecedented scale. With smokeless now more in demand mines are producing the heaviest tonnage in the history of the field. Although Western shipments are unusually heavy and orders from Cincinnati are on a large scale, yet the Eastern demand is reaching larger proportions.

Tug River mines are maintaining their output at 100,000 tons a week in the aggregate, with much of the coal so produced moving to Western markets. There is a brisk demand both for mine run and screenings among the steel manufacturers. There is no evidence of a strike in this region and miners are giving no thought to ceasing work. On the contrary they are bending their efforts toward increasing production.

HIGH-VOLATILE FIELDS

Kanawha

There has been a growing production since the beginning of the strike and between 30 and 35 mines are now producing coal. Miners are becoming restless and are manifesting a keener desire to return to work. With the betterment of demand prices are also advancing.

Logan and Thacker

Logan fields are all in operation and some of them are producing to capacity. The demand in steel centers is particularly strong, some coal going into the Pittsburgh District. Lake business is also growing. There is no industrial trouble in this region to mar production and earnings of miners are larger than they ever were.

Thacker production has now reached 145,000 tons a week and "no market" losses have been reduced to about 13 per cent of capacity. So far there has been no interference with operations because of the strike, although the union still claims the existence of a strike in this territory. Market conditions are propitious for a large production with the demand growing from day to day.

Northeastern Kentucky

The strike is not affecting this district except as to one or two mines producing domestic and steam coal. The principal demand is for byproduct gas coal and mines have all they can do to handle the growing volume of business. Lake shipments are also heavy. The Chesapeake & Ohio and the L. & N. are taxed to handle the heavy tonnage tendered them.

West

KANSAS CITY

The situation remains unchanged. So does the drowsy demand. If mines could reopen today it is doubtful if there would be enough call for coal to justify operating. Apparently there is more fuel in storage than was supposed. It will last at least another month. Expectation of lower freight rates keep some buyers out of the market. Dealers, having been so badly stung on spring stocking last year, that they cannot be induced to stock now. When the late summer arrives and demand picks up, they may be unable to meet the demand even at high prices.

DENVER

No change has been made in market prices since the wage reduction Nov. 1, 1921, by many of the large operators. Domestic coal is selling at $5 per ton for lump and $4.50 for nut. Mine run is quoted at $3.50, while slack varies from $1.50@$2 a ton.

SALT LAKE CITY

Utah production for April was 255,319 net tons, which is a decrease of about 30,000 tons under the production of the month before. The public, after its flurry of interest in the gun-play of 10 days ago at one or two points in the mining fields, now is apathetic again toward the whole strike situation. A drop in freight rates to the coast is expected to stimulate shipping to coal markets in that direction.

Canada

TORONTO

The market continues very quiet, and the coal situation excites but little interest, owing to the slackness in the demand. Retailers are generally stocked up sufficiently to meet all requirements on the present scale for many weeks to come, and have so far made no change in prices to correspond with the advance at the mines.

Quotations are as follows:

Anthracite egg, stove and nut	$15.50
Pea	14.00
Bituminous steam	9.25@9.75
Domestic lump	11.25
Cannel	16.00
Wholesale f.o.b. cars destination:	
¾ in. lump	$8.90@$9.00
Slack	7.25@ 7.75

News Items From Field and Trade

ALABAMA

The Birmingham Ice & Cold Storage Co., which has conducted an extensive retail coal business in Birmingham for over thirty years, has retired from this branch of its activities and disposed of its business to the **Ivy Leaf & Piper Coal Co.** The latter already operates a number of retail yards in the city.

ALASKA

The Department of the Interior is perfecting plans for the operation of two coal mines in the Chickaloon District, which have been under development by the Navy and which have been turned over to the Interior Department. It is hoped to lease the mines to some responsible engineering or coal mining company possessing the commercial experience and financial resources necessary to develop and operate with a primary object of supplying coal for Naval purposes. The detailed plans were discussed with a number of companies, and were definitely considered by four firms. Of these, the **Lake & Export Corporation**, of Huntington, W. Va., was the only one considering the prospects sufficiently godd to warrant the expense of a preliminary field and engineering examination. Accordingly, the department has agreed to give that company until July 15 to complete an examination of the mines and possible markets and to make an offer for leasing and operation.

COLORADO

Arrangements have been made for the transfer of **B. W. Dyer**, federal mine inspector for Alaska, to the position of district supervisor of the coal leasing work of the Bureau of Mines, with headquarters at Denver.

ILLINOIS

The question of purchasing power for coal mines versus generating power by the mines themselves in groups will be thoroughly discussed on the evening of May 22 in Chicago at a joint meeting of the Chicago section, American Institute of Electrical Engineers; the Chicago section, American Institute of Mining and Metallurgical Engineers and the Western Society of Engineers. Three papers will be read: "Central Station Power for Coal Mines," by J. C. Damon, engineer of the West Penn Power Co., Pittsburgh, Pa., "Purchased Power for Coal Mines," by J. Paul Clayton, vice-president of The Central Illinois Public Service Co., and "Purchased Power for Coal Mines," developing the idea of group generation, by W. C. Adams, of Allen & Garcia, Chicago. The meeting will be in the rooms of the Western Society of Engineers, 1735 Monadnock Building, Chicago.

The Union Fuel Co., with headquarters in Chicago and six mines at Springfield, has been reorganized. At a meeting of the board of directors **W. H. Leland** was elected vice-president and general manager in full charge of sales and operation. He is expected to lay down a new program of progress for the company and to build up a new organization to handle its business. Mr. Leland was once a vice-president of the Peabody Coal Co. and recently one of the vice-presidents of the Consumers Company of Chicago. Giving up his other connections, he will now devote his entire time to the Union. **L. J. Pulliam**, who was president and prime mover behind the old Union Fuel Co., is now chairman of the board of directors. The other officers chosen in the reorganization are **George F. Goodnow**, president, **Fred H. Buschen**, treasurer and **B. F. Bliss**, secretary.

W. A. Brewerton, of the Chicago office of the Sangamon Coal Co., was in Springfield recently.

F. A. Brazelton, general sales manager of the O'Gara Coal Co., Chicago, was a visitor recently at the company's offices in Harrisburg. He also visited mines in the vicinity of Harrisburg.

J. B. Burkhardt, superintendent of the Security Coal & Mining Co., at Duquoin, is enjoying a vacation of several weeks at Okawville.

The Illinois Coal & Coke Corporation has completely rebuilt the headframe at the Empire Mine No. 1 at Springfield and is repairing and remodeling the shaker screens at the same property.

The remaining machinery and property of the **Old Abe Mining Co.**, at Du Quoin, has been sold by the sheriff to Robert Eaton, of Sunfield, who was the highest bidder. The mine was operated by the **Kanawha Fuel Co.**, of Milwaukee, and A. S. Austin, who was superintendent of the plant, has returned to Milwaukee.

The North Mine, at Royalton, of the **Franklin Coal & Coke Co.**, is undergoing some extensive repairs and improvements during the shutdown. The main shaft of the mine is being enlarged. New cages will be installed and when the shaft is completed five-ton cars will be used underground instead of two-ton cars now used.

T. S. Cousins, president of the Majestic Oil, Gas & Refining Co., Du Quoin, has returned from a business trip into the oil fields of Oklahoma. He divides his time between the oil and coal business, being general superintendent for the Equitable Coal & Coke Co., operating at Herrin, Du Quoin and Johnston City.

INDIANA

Suit for $5,000 in wages was filed by eighty-six coal miners recently in the Vanderburgh probate court against the **Blair Coal Co.**, which concern is bankrupt. The company has not operated for several months and an Evansville attorney was named receiver some time ago.

Special Judge James A. Blackburn, of Mt. Vernon, in the Gibson Circuit Court, has sustained a defense motion to quash the indictment in the case of the State against the **Big Four Coal Co. and Edward J. Hatchett.** The defendants were charged with a misdemeanor in their alleged failure to ventilate properly the Liberty Mine at Francisco, Ind., Feb. 16, 1921, when four men were killed by an explosion. The court held the indictment was faulty. However, he ruled that the corporation was indictable for the offense charged and ordered the case resubmitted to the grand jury or the prosecuting attorney himself to file a new charge. Early this year an attempt was made by the state to convict Charles Wilder, superintendent at the mine of manslaughter in the same connection, but he was acquitted.

Charles Martindale, of Indianapolis, master in chancery of the Federal Court, has fixed July 3 as the last date on which claims can be filed with James A. Cooper, a Terre Haute attorney, receiver for the **Roland-Power Consolidated Collieries Co.** The company filed a petition in bankruptcy on April 22.

The Diamond Block Mining Co., Indianapolis, has been organized with a capital stock of $100,000. The directors are A. B. Rabe, William B. Paul and William H. Stephens.

KENTUCKY

Recent heavy rains on Martins and Catrons Creek branches of the L. & N., out of Harlan, have interrupted service to a large extent. About three miles out on Catrons Creek 200 ft. or more of main-line track was washed away, and two trestles were put out of commission. This cut out car service for several days to part of the mines on this branch, including; **Harlan Fuel Co., Bowling Mining Co., Mahan-Ellison Mining Co. and Perkins-Harlan Coal Co.**

Recent charter changes in Kentucky were as follows: **Elkhorn Block Coal Co.**, Ashland, increasing capital from $15,000 to $125,000; **Middle West Coal Co.**, Ashland, reducing capital from $100,000 to $10,000; **Consumers Coal Association**, Louisville, $10,000, J. A. Woolfolk, T. H. Hicks and W. H. Roose; **Harvey Jellico Coal Co.**, amended articles placing number of directors at five, and changing meeting place from Louisville to Pineville; amendment signed by Edward H. Jewett, Walter Brooks and L. H. Stone.

Special agents of insurance companies report that very little strike insurance has been written in Kentucky this spring for coal mines, the operators having refused to consider such insurance, even at low rates at which it was written.

The Cumberland Valley Coal Co., a corporation organized a few weeks ago by White L. Moss and associates, with headquarters at Pineville, will establish offices and maintain a selling agency either at Hazard or Whitesburg. This company will do business in the eastern Kentucky field.

Ordered abandoned a short time ago and then dismantling halted by telegraphic instructions, the town of Cherry, is awaiting definite word as to the plans of the St. Paul Coal Co. as to the Cherry Mine. The company recently announced that it had been found cheaper to purchase fuel than to continue operations in the northern Illinois field. This was accompanied by instructions to dismantle the workings at Cherry. Then residents of the town, realizing that the order meant doom for the town, sent a petition to the general office of the company setting forth the hardships which the abandonment order would work. Cherry is now awaiting the final decision of the St. Paul Coal Company with interest.

MISSOURI

The Central Coal & Coke Co., had a cave-in at the Fleming Mine, located on the Wabash and Santa Fe, at Camden. This mine was first opened in 1876 and has been in operation only spasmodically, account of the high cost and mining conditions.

In 1915 an economical method to operate the mine was hit upon and it was opened in 1917 and has continued to return a revenue from that time on. The coal seam at Camden is thin and the roof and bottom are bad.

Carl Hirdler, for over thirty years traffic manager and manager of the smithing coal department of the Sligo Iron Store Co. of St. Louis, severed his connections with that company on May 1 to act in a similar capacity with the Wallace Coal Co., of St. Louis.

NEW YORK

Many coal firms in New York City have changed their addresses since May 1. Among these are the following: **Johnstown Coal & Coke Co.**, from 80 Broad St. to 11 Broadway; **E. H. Russell, Inc.**, transportation, from 80 Broad St. to 11 Broadway; **The Interstate Coal & Dock Co.**, from 32 Broadway to 1 Broadway; **The Coale Corporation**, from 11 Stone St. to 1 Broadway; **Pilling & Co.**, from 71 Broadway to 2 Rector St.; **Cosgrove & Co.**, from 149 Broadway to 40 Rector St.; **The Lee Coal Co.**, from 2 West 45th St. to the Whitehall Bldg., 17 Battery Place.

S. P. Woodside has been appointed chairman of the Coal, Coke & Iron Ore Committee, Central Freight Association Territory, 143 Liberty St., succeeding **J. C. Venning**, resigned.

OHIO

Papers have been filed with the secretary of state decreasing the capital of the **Walter-Wallingford Coal Co.**, Cincinnati, from $100,000 to $20,000.

M. T. Roach, president of the Logan-Pocahontas Coal Co., with headquarters at Charleston, was a recent visitor in the Cincinnati market.

William Pritchard, vice-president of the Long Flame Coal Co., of Stowe, W. Va., spent the first few days of May in Cincinnati on business.

The Ivy Branch Coal Co. of Ivaton, W. Va., was represented in the Cincinnati market a few days ago by **John W. Moore.**

H. S. Gay, representing the Gay Coal & Coke Co., was a visitor a few days ago in Cincinnati.

PENNSYLVANIA

Among coal companies recently incorporated are: **G. J. Walsh Co., Inc.**, Philadelphia, mining, preparing, selling and dealing in coal and coke; capital, $35,000; treasurer, Robert W. Griffith. Incorporators: George J. Walsh, Robert W. Griffith and J. Watson Harper, Germantown, Philadelphia. **Rutland Fuel Co.**, Pittsburgh, mining coal and leasing, owning coal lands; capital, $20,000; treasurer, Teddy R. Wineman, Derry. Incorporators: David L. Gensbigler, Charles M. Kemp and Teddy R. Wineman, Derry. **Rose & McGregor Coal Co.**, Pittsburgh, leasing, buying, selling and dealing in coal lands and mining; capital, $100,000; treasurer, Roy Rose, Sewickley. Incorporators: Roy Rose, C. C. McGregor, Pittsburgh, and F. J. McGregor, Crafton.

The Central Coal Association, Altoona, has issued an interesting 15-page booklet, "The Coal Strike in Central Pennsylvania."

J. J. Gibson, manager of the supply sales department of the Westinghouse Electric & Manufacturing Co., becomes assistant to vice-president in the new plan of organization and the establishment of a merchandising sales department **A. A. Brown** is appointed manager of syndicate operations; **J. S. Tritle**, manager of the St. Louis office becomes manager of the merchandising sales department; **T. J. Pace**, assistant manager of the supply department becomes manager of the supply sales department; **C. E. Allen**, manager of the central station division of the Chicago office, becomes manager of the St Louis office; **George Baily**, assistant to the manager of the supply department, becomes supervisor of distributing agents; **M. C. Morrow**, assistant sales manager of the Westinghouse Electric Products Co., becomes assistant to the manager of the merchandising sales department, and **J. J. Dorney**, manager of the Industrial Division, St. Louis office, becomes assistant to the manager of the merchandising department.

All operating mines in the coke region have held their own or shown slight gains recently, except the Reliance Coke Co., at Denbo, near Brownsville. It is located on the Monongahela River between two union mines of the Vesta Coal Co., and was forced to suspend after making a start. The Mather Collieries Co., is nearly normal and Crucible Fuel Co. is running 70 per cent. The Crystal plant of the Hillman Coal & Coke Co., the only one of its coke region plants it has been able to keep going steadily, increased till it is now normal.

Edward L. Clemmer, of Brownsville, world war veteran, and until recently on the engineer corps of Alicia No. 1 and No. 2 coal and coke plants of the Pittsburgh Steel Co., has been appointed county engineer.

With the coal mines of Pennsylvania practically at a standstill, the number of **mine fatalities during April** decreased from 87 in March to 38, according to figures made public by Clifford B. Connelley, Commissioner of Labor and Industry. The total number of fatalities for April was 104, compared with 172 for March, in all industries. This is the lowest fatal record for any month this year.

As far as can be learned no clues have been found that would lead to the apprehension of incendiaries who recently destroyed the blacksmith shop at the Coalville Mine of the **Penfield Coal & Coke Co.**, Weedville, with a resultant loss of from $6,000 to $8,000.

Fire of unknown origin destroyed the **Spruks Coal Co.** breaker at Childs, near Carbondale. The breaker was recently purchased by the Spruks company, of Scranton from the Stone Coal Co. This morning's blaze means a loss of between $40,000 and $50,000.

The H. C. Frick Coke Co. is replacing the steam equipment at the Colonial No. 3 plant, at Grindstone, Fayette County, with electric equipment, power to be furnished by the West Penn Power Co., who is now running the line from the Brownsville, substation to that point. The Frick company will distribute the power to some of the other nearby plants, among them being the new big river plant it is putting in near Fayette City; where coal from several mines, which are connected together on the inside, will be assembled underground for river loading.

At the twenty-fifth annual meeting of the **American Society of Testing Materials**, to be held June 26-30 at Atlantic City, the Seventh Session, on June 29, will be devoted to coal, coke, timber and shipping containers. The report of committee D-5 will be heard on recommending revisions in standard methods of sampling coal and in the tentative method of testing for fusibility of coal ash. Hubb Bell will present a paper on forms of specifications for purchasing coal. E. B. Ricketts will outline governing factors in coal purchase and present a basis for comparing coals of differing ash contents.

TEXAS

Work has started on the construction of the coal bunkering plant of the **Channel Coal Co.**, near Houston. This will be the first ship bunkering plant to be built on the Houston Ship Channel, and is being built under a thirty-year franchise granted the Channel Coal Co. The first unit has an estimated cost of $48,000. Modern machinery and equipment for unloading coal from ships and barges will be installed.

VIRGINIA

The United States Circuit Court of Appeals at Richmond has reversed the judgment of the United States District Court at Charleston, W. Va., under the terms of which the **Fort Dearborn Coal & Export Co.** was allowed the sum of $16,318.24, representing 897 tons of mine run confiscated by the Norfolk & Western in August, 1920, for fuel purposes, at Bluefield, this coal being confiscated enroute to Lambert's Point for export. The appeal court holds that in ascertaining damages, the value of the credit the plaintiff would have received in the pool at Lambert's Point should have been made the determining factor, instead of the price of the coal at the mine. Inasmuch as the market was falling somewhat at the time, it is indicated by the records that the value of the coal in the pool would have been less than the purchase price. The coal was secured from the **Old Dominion Coal Corporation.** Following confiscation that company sued the Fort Dearborn company in the circuit court of Kanawha County and was awarded the amount of the sales price.

WEST VIRGINIA

C. H. Jenkins, of Fairmont, secretary and treasurer of the Hutchinson Coal Co., was a recent visitor in the Clarksburg district.

Clarence D. Robinson, one of the leading operators of the Fairmont region was called to Winchester, Va., not long ago, by the death of his brother, Charles Robinson, who had been ill during the greater part of the winter.

It has been possible for the **Penn-Mary Coal Co.**, which is a subsidiary of the Bethlehem Steel Corporation, to resume operations at several of its plants in Preston and Monongalia counties in northern West Virginia, five mines of the company now being in operation.

Two companies heretofore in idleness have resumed operations on the Charleston Division of the Baltimore & Ohio. They are the **Copen Creek Coal Co.**, operating at Copen and the **Braxton & Pittsburgh Coal Co.**, operating in the same vicinity. The mines of both companies have been shut down for some time.

Recently an explosion occurred in the Summerlee Mine of the **New River Co.**, at Summerlee. At the time of the explosion old timbers were being shot out near the shaft bottom, preparatory to retimbering, for which purpose permissible explosives were used. Shots were fired from the surface by means of a battery. It is believed that the explosion was caused by stirred up coal dust and an excess of explosives. The blast caused considerable damage in and about the hoisting and the air shafts, partially closing them.

An important event in the Wyoming County field at the end of April was the shipment of the first car of coal from the new plant of the **Raleigh-Wyoming Coal Co.**, at Glen Rogers. Two years have elapsed since the company, composed largely of Boston capitalists, started development work on a large tract in Wyoming County, under the direction of Carl Scholz and no effort has been spared to make this one of the most modern plants in the state. It is possible with the equipment and machinery installed to hoist coal at the rate of 6,000 tons every shift. The Beckley seam of coal is to be mined from shafts sunk to a depth of 600 ft. In order to make development of this coal possible the Virginian Ry. extended its line from Maben up Milam Branch of Guyan River for a distance of sixteen miles.

The American Coal Co., of Alleghany County, McComas, in the Pocahontas field, has contracted with Roberts & Schaefer Co. for the installation of a dry cleaning plant at its Crane Creek operation. Slack coal from this operation was given a thorough test at the plant of The American Coal Cleaning Co., at Welch, and the reduction of ash made by these tables so impressed the mining company that it determined to replace its washery with the dry plant. This installation is made in conjunction with the construction of a steel Marcus tipple.

H. H. Morris, former general superintendent of the Chesapeake & Ohio, is now located in Huntington, as resident manager for the Wholesale Coal Co., and the Bertha Coal Co., of Pittsburgh, Pa.

WISCONSIN

The 10-ton bridge now under construction at the dock of the **Superior Coal & Dock Co.**, Superior, will be ready for work early in July. This will materially add to the handling facilities of the dock.

Dock men of Duluth and Superior held a meeting recently at Superior, to discuss ways and means to reduce risk of loss by tornado. Twenty-four docks at the Head-of-the-Lakes were represented at the conference.

The Fellenz Coal & Dock Co., which operates a dock yard near Racine St., Milwaukee, will soon displace its present figure-4 derrick hoist with an electrically operated steel bridge hoist, which will unload coal from vessels at the rate of 500 tons per hour. Other improvements, including railway tracks and increased storage room are being made. The Fellenz dock is one of the oldest retail coal yards in Milwaukee.

BRITISH COLUMBIA

OUTPUT FOR MARCH, 1922

Mine	Tons
Vancouver Island District	
Western Fuel Corporation of Canada, Nanaimo	64,890
Canadian Collieries (D) Ltd.	
Comox	24,108
Extension	20,206
South Wellington	8,610
Granby Cons. M. S. & P. Co.	26,787
Nanoose Wellington Collieries	8,750
Old Wellington (King & Foster)	513
Total	153,864
Nicola-Princeton District	
Middlesboro Collieries	5,473
Fleming Coal Co.	3,109
Coalmont Collieries	11,671
Princeton Coal & Land Co.	2,003
Total	22,256
Crow's Nest Pass District	
Crow's Nest Pass Coal Co.	
Coal Creek	56,780
Michel	33,240
Corbin Coal & Coke Co., Corbin	7,430
Total	97,450
Grand Total	273,570

QUEBEC

Soft coal is being imported into Montreal by sea from the Virginia and Pennsylvania coal fields cheaper than it can be brought from Sydney, N. S. All large consumers are stocked sufficiently to provide for their requirements for several months. Since the opening of navigation two steamers have arrived laden with coal from Norfolk, Va., and three others are on the way. The coal was shipped since the strike and is from non-union mines. **The Dominion Coal Co.**, although it usually has its yards empty by May 1, has on hand 54,000 tons of coal, carried over from the winter.

WASHINGTON, D. C.

Godfrey M. S. Tait announces the removal of his office to 808 Eighteenth St., N. W., where he will continue the preparation of coal property valuations as a guide to investors, banking houses, and for obtaining tax adjustments.

G. R. Mansfield has been placed in charge of the section of the Geological Survey devoted to non-metalliferous deposits.

W. T. Lee is continuing a study for the U. S. Geological Survey of the stratigraphy of the oil sands in southern Wyoming.

Charles Butts is investigating the stratigraphy and the paleontology of the lower paleozoic formations in Georgia, Alabama and Tennessee.

J. D. Sears, James Gilluly and W. H. Bradley will do geological work in Moffat County, Colorado, during the coming field season.

A. E. Fath and W. W. Rubey are to make a study of oil prospects in that part of eastern Wyoming which borders on the Black Hills.

D. F. Hewett is looking into reported discoveries of oil near Fallon, Nevada. While in the state he will make a study of the application of aluminum salts to certain soils.

A. F. Melcher will make a study of the porosity of oil sands in the Burbank field of Oklahoma, for the U. S. Geological Survey.

As a result of the discovery of oil, near Avon, Mont., the U. S. Geological Survey has sent **A. J. Collier** to the region to study its geology.

C. E. Dobbin, A. H. Redfield and J. E. Hoffmeister have been assigned to work on the coal fields of Garfield County, Mont., for the U. S. Geological Survey.

A study of the pleistocene and tertiary deposits of the Columbia plateau of eastern Washington and the neighboring parts of Idaho is to be made during this field season by **J. T. Pardee**, of the U. S. Geological Survey.

An examination of the Wasatch plateau coal fields is to made by **E. M. Spieker and J. B. Eby** of the U. S. Geological Survey.

Traffic News

In the complaint of the **Clay County Coal Operators' Association**, an I. C. C. examiner recommends that rates on coal from points on the Horse Creek branch of the Cumberland & Manchester R.R. to interstate destinations are unreasonable because they exceed by more than 10c. the rates to the same destinations from points on the main line of the road.

In the complaint of the **Northwestern Traffic and Service Bureau** an examiner recommends that rates on hard coal from Milwaukee, originally consigned to Vesta, Minn., diverted in transit at Sanburn, Minn., and reconsigned to Darfur, Minn., were not unreasonable.

Edward K. Marshall, of Philadelphia, has complained against unreasonable rates on coke from Elkhorn, W. Va., to Harrisburg, Pa.

The I. C. C. has suspended until August 12 the proposed cancellation of joint through rates on bituminous and cannel coal from the Bessemer & Lake Erie R. R. Group No. 1 points, located in Pennsylvania, to various destinations on the Buffalo, Rochester & Pittsburgh, located in New York and Pennsylvania.

The C. Reiss Coal Co., of Cheboygan, Wis., in a complaint to the commission alleges unreasonable rates on coal from Pittston, Avoca and Dunmore, Pa., to St. Paul and Minneapolis.

The Megeath Coal Co., of Omaha, alleges unreasonable rates on coal from Winton, Wyo., to points in California, Nevada, Utah, Oregon, Idaho and Montana.

The commission has assigned for hearing at Washington, May 22, the matter of divisions of joint rates on coal between the **Ohio & Kentucky Ry., and the Louisville & Nashville.**

In the complaint of the **M. E. Case Coal Co.** an I. C. C. examiner recommends that the commission is without jurisdiction to consider intrastate rates on coal from La Marsh, Ill., to Galesburg, Ill., moving subsequent to the termination of Federal control, on the state of facts presented.

The Public Utilities Commission of Idaho has complained against unreasonable commodity rates from and to points on the Boise Valley Traction Co. lines by reason of failure to establish joint through rates. The commission asks for joint rates on coal and other products.

In the complaint of the **Loogootee Fire Clay Products Co.**, the commission decides that the rates on bituminous coal from Wheatland to Vincennes Ind., and from Montgomery and Cannelburg to Loogootee, Ind., during Federal control were unreasonable.

In the complaint of the **Burns & Hancock Fire Brick & Clay Co.**, the commission decides that the rates on mine run bituminous coal from certain mines in the Clinton and Brazil districts in Indiana to the company's plants at West Montezuma, Brazil and near Terre Haute, Ind., during Federal Control were unreasonable.

In the complaint of the **Crookston Gas Co.**, an I. C. C. examiner recommends that shipments of coke from St. Paul to points in Minnesota from June 25, 1918, to the end of Federal control were overcharged and that the company is entitled to reparation. Complaint covering shipments from March 1, to Sept. 1, 1920, are recommended to be dismissed for want of jurisdiction.

Rehearing of the complaint of the **Roundup Coal Mining Co.** has been requested by the Northwestern Coal Dock Operators' Association, which asks the commission to fix rates on coal from Roundup, Mont., to points in South Dakota upon a basis higher than the scale adopted in the Holmes & Hallowell case, making allowance for adverse transportation conditions prevailing from Roundup to South Dakota points as compared with favorable conditions from Duluth to the same destinations. It is said the rates from Roundup are so low that they constitute an undue prejudice.

Recent Patents

Miner's Blasting Battery. Joseph S. Beeneck, Nanticoke, Pa., 1,408,435. March 7, 1922. Filed July 10, 1919; serial No. 309,948.

Device for Crushing Coal and Other Materials. Charles A. Kloman, Bellevue, Pa., 1,408,607. March 7, 1922. Filed June 25, 1919; serial No. 306,612.

Coal Distillation Retort. Arthur Roberts, Evanston, Ill., assignor to American Coke & Chemical Co., Chicago, Ill., 1,408,640. March 7, 1922. Filed Sept. 15, 1916; serial No. 120,351. Renewed Feb. 13, 1920; serial No. 358,432.

Coal Ladder. W. H. Towne, Otto M. Thjimoe and W. B. Mercer, Chicago, Ill., 1,408,659. March 7, 1922. Filed Dec. 3, 1920; serial No. 428,081.

Undercutting Machine. Frank L. O. Wadsworth, Sewickley, Pa., assignor to the Jeffrey Mfg. Co., Columbus, Ohio, 1,408,662. March 7, 1922. Filed April 13, 1912; serial No. 690,486. Renewed Nov. 24, 1919; serial No. 340,239.

Mine Car. Daniel C. Mulvihill, Hannibal, Mo., 1,408,767. March 7, 1922. Filed Dec. 20, 1920; serial No. 432,083.

Mine-Car Bearing and Axle. James C. Gaskill, Fairmont, W. Va., 1,408,878. March 7, 1922. Filed Dec. 15, 1921; serial No. 522,566.

Method of Mining Coal. Richard Battey, Black Diamond, Wash., 1,408,971. March 7, 1922. Filed Aug. 30, 1920; serial No. 406,821.

Gathering-Reel Mounting for Mine Locomotives. William E. Wolfe, Wilder, Va., assignor to the Clinchfield Coal Corp., Dante, Va., 1,409,328. March 14, 1922. Filed March 18, 1920; serial No. 366,936.

Mining Machine. George F. Dillig, Pittsburgh, Pa., 1,409,532. March 14, 1922. Filed June 9, 1920; serial No. 387,540.

Fastener for Mine-Car Doors. John Wysock, Plymouth, Pa., assignor of one-third to Anthony Visotski, Wilkes-Barre, 1,409,635. March 14, 1922. Filed May 20, 1920; serial No. 382,847.

Coal Agitator for Mechanical Stokers. Robert S. Riley, Worcester, Mass., assignor to Sanford Riley Stoker Co., Ltd., Worcester, 1,409,972. March 21, 1922. Filed April 13, 1917; serial No. 161,862.

Self-Dumping Mine Cage. William B. Reynolds, Roundup, Mont., 1,410,124. March 21, 1922. Filed Oct. 9, 1920; serial No. 415,757.

Means for Feeding and Mixing Powdered Coal and Air. Wm. R. Field, Decatur, Ill., 1,410,246. March 21, 1922. Filed March 15, 1920; serial No. 366,101.

Coke-Oven Smoke-Flue Carriage. Joseph Becker, Pittsburgh, assignor to The Koppers Co., Pittsburgh, 1,410,447. March 21, 1922. Filed Dec. 3, 1918; serial No. 264,967.

Automatic Door for Mines. John T. Thomas, Fort Myers, Fla., 1,410,425. March 21, 1922. Filed March 28, 1921; serial No. 456,144.

Mining Locomotive. Thomas E. Pray, Chicago, assignor to Goodman Mfg. Co., Chicago, 1,410,596. March 28, 1922. Filed July 19, 1919; serial No. 311,941.

Coking Retort Oven. Joseph Van Ackeren, Pittsburgh, assignor to The Koppers Co., Pittsburgh, 1,410,784. March 28, 1922. Filed April 27, 1920; serial No. 377,024.

Trade Literature

Grindle Powdered Fuel Equipment. Grindle Fuel Equipment Co., Harvey, Ill. Pp. 40; 8½ x 11 in.; illustrated. The advantages and savings, both in cost and labor, obtained by the installation of the Grindle system are interestingly told, as are also its operation and some of the uses to which it can be adapted.

Jeffrey 35-B Shortwall Mining Machine. The Jeffrey Mfg. Co., Columbus, Ohio. Bulletin No. 365. Pp. 11; 7½ x 10½ in.; illustrated. Describes the work performed by the 35-B Shortwall Coal Cutter in coal mines and mentions as one of its features the self-propelling Handitruck.—Advertiser.

Circuit Breakers. The Cutter Co., Philadelphia, Pa. Pp. 16; 6 x 9 in.; illustrated. A variety of remote-control circuit breakers, of both motor and magnetically operated types, together with other forms of apparatus especially adapted to central-station requirements are herein described.—Advertiser.

Type CSU Multi-Stage Automatically Balanced Centrifugal Pumps. Dayton-Dowd Co., Quincy, Ill. Bulletin 248. Pp. 20; 7½ x 10½ in.; illustrated.

Page-Armco Welding Rods and Electrodes. Page Steel & Wire Co., Bridgeport, Conn. Catalog No. 500. Pp. 40; 6 x 9 in.; illustrated. Describes the peculiar characteristics of Armco iron and shows its availability for various welding purposes. It gives the American Welding Society specifications for electrodes and some useful informaton for electricians.

Publications Received

Preparation and Uses of Tar and its Simple Crude Derivatives, by W. W. Odell, Bureau of Mines. Technical Paper 268. Prepared under a co-operative agreement with the Illinois State Geological Survey and the Department of Mining Engineering of the University of Illinois. Pp. 84; 6 x 9 in.; illustrated.

Ninth Annual Report of the State Inspector of Coal Mines of Colorado. Pp. [illegible]; 6 x 9 in.; tables.

The Mineral Resources of the Philippine Islands for the Years 1919 and 1920. Division of Science, Bureau of Mines, Manila, P. I. Pp. 70; 7½ x 10½ in.; plates and tables.

Evaporation Loss of Petroleum in the Mid-Continent Field, by J. H. Wiggins. Bureau of Mines. Bulletin 200. Pp. 115; 6 x 9 in.; illustrated, charts and tables. Report of investigations by the Bureau of Mines of the loss of gasoline by evaporation in the storage and handling of petroleum.

Mac's Directory of Coal Sales Companies. Coal Information Bureau, Pittsburgh, Pa. Pp. 160; 9 x 12 in. Price, $5. This book is made up in three sections. The first is devoted to list of coal companies, arranged according to states, with classification as to whether sales agent, operator or wholesaler; the second section gives the list alphabetically arranged and the third section contains a complete alphabetical list of sales officers, with company affiliation and city in which located.

Coming Meetings

National Retail Coal Merchants' Association. Fifth annual convention at the Drake Hotel, Chicago, Ill., May 18-20. Executive secretary, Joseph E. O'Toole, South Penn Square, Philadelphia, Pa.

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

National Coal Association will hold its annual meeting at Congress Hotel, Chicago, May 24 to 25. Committee on arrangements, Harry N. Taylor, chairman, Dr. F. C. Honnold and Walter Cunningham

The American Wholesale Coal Association will hold its annual convention at Detroit, June 1 and 2. Secretary, G. H. Merryweather, Union Fuel Bldg., Chicago.

The fourteenth annual meeting of the **International Railway Fuel Association** will be held in the Auditorium Hotel, Chicago, Ill., May 22 to 25.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at Trenton, N. J., June 7 and 8.

American Institute of Chemical Engineers will hold its summer meeting at Niagara Falls, Can., June 19-22, with headquarters at the Clifton Hotel. Secretary, Dr. J. C. Olsen, Polytechnic Institute, Brooklyn, N. Y.

Southwestern Interstate Coal Operators Association will meet June 13 at 519 Keith & Perry Bldg., Kansas City, Mo. Secretary, W. L. A. Johnson, Kansas City, Mo.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, Editor

Volume 21 NEW YORK, THURSDAY, MAY 25, 1922 Number 21

Settlement or an Expedient?

AS THE end of the second month of the dual coal strike approaches interest increases as to the form the ultimate solution will take. For anthracite the alternatives apparently are clear—either the operators and the men will get together on the basis of a wage somewhere between the 20-per cent increase demanded by the miners and the 21-per cent decrease demanded by the operators, or the third party will step in, either by invitation or by right of public necessity. No one appears to expect resumption of hard-coal mining before July 1, and the conservative say Aug. 1.

With respect to bituminous coal the situation is more complicated, with the possibility that the otherwise simple conditions surrounding the hard-coal negotiations will be involved. Should the dictates of internal policy and politics in the United Mine Workers demand the continuance of the hard-coal strike to help win the bituminous-coal strike, we may feel chilly this winter.

Two possible—and only two—solutions to the trouble in the bituminous coal areas are in sight. One of them contemplates a weakening of the miners followed by local settlements, to which must be added the possibility of the weakening of operators. There are many such who, running true to form, may reach the point of conceding a wage that will tempt the miners locally to withdraw from the all-embracing policy of the international officers of the union for national wage agreements. High prices will tempt some to any course.

The miner, however, is pretty thoroughly imbued with the belief that he is striking to preserve his union, and for that he will fight long and hard. To save his organization he will hold out long after he would give in on a straight-cut matter of wages. There are yet in the ranks sufficient of the old-time miners and there persists enough of the old-time spirit to hold their forces intact for a long struggle. What the union may lose in defections in West Virginia will be more than made up by gains in Pennsylvania. So long as the officers of the union can hold before the men the necessity of a four-state settlement as the only alternative to a breaking down of their organization, they will be able to maintain the morale of the men.

As a prerequisite to settlement there must be the beginning of negotiations. Since the union demands such a beginning on the basis of interstate conference and the operators refuse that method, we have a stalemate in the bituminous-coal situation.

As a second avenue, apparently the only other, is the interjection of the third party—the public through the government. At the present writing this is generally conceded as the more likely outcome. Just when the government will feel warranted in issuing one of those not-to-be-refused invitations can only be guessed, but the time is yet some distance away.

Patently the miners have the most to gain by delay. It was coolly calculated policy that postponed the formulation of their demands on the operators from September, 1921, to February, 1922. They were betting on the upturn in industrial conditions. They lost. They are betting on the same hand again, but now things are coming their way. Business is gaining. When, some time this summer, stocks are reduced to that irreducible minimum, when non-union production has reached its maximum, and when demand for coal becomes insistent, then something or somebody must give way. That time may come by the first of July, possibly not until August or even later, but come it must.

When the government seeks to effect a settlement the union will have won, because that process will mean nothing less than a consideration of settlement on a national basis, removing as it were the present apparently insurmountable barrier of legal prohibition of operators meeting with the miners on that basis. Furthermore, by the time negotiations are begun there will be an excellent prospect of heavy demand, good prices for coal and less pressure for wage and cost reductions.

The net result may then well be that more than at any time in the past the union bituminous-coal operators will find themselves between the two millstones of non-union competition and the United Mine Workers. The union operators have no unified policy, no solidified economic background, no co-ordinated preparation for meeting the miners when the meeting comes. Unless some way is found to overcome these vital shortcomings, the settlement they will derive will be one of expediency—one that will react to leave them in no better, if not in worse, condition a year or two hence.

Heads I Win; Tails You Lose

PLAYING the game both ends against the middle is great stuff when you can get away with it. Here we have a dual miners' strike, called it is professed, in one instance, because of inability to get into conference with the operators and in the other instance apparently because the operators have joined in conference.

The United Mine Workers tell us that the soft-coal miners have suspended operations because the operators refuse to meet in joint negotiations to discuss a national wage scale. The widely heralded protests against the declared policy of the operators for local settlements, as voiced by Mr. Lewis and other spokesmen for the union, are intended to convince us that nothing else stands in the way of a settlement of the controversy; that the men are ready to work provided the operators will concede this—to them—vital point.

Secretary Davis makes much of this point, taking the position that the bituminous-coal operators are responsible for the closing of their mines because they object to this particular form of meeting with the miners. In fact, if we read but one part of what the union, Secretary Davis and the unofficial spokesmen for the union have to say on the strike—that is, the part dealing with bituminous coal—we could be led to conclude, as many have, that nothing else is involved.

He who lets himself into this conclusion is being led astray. The union, of course, seeks as a prerequisite to actual wage negotiations the submission of the operators to national wage scales, but were that conceded today the solution of the controversy would be but little nearer. In the anthracite region there is involved no such question of policy. Here is a straight question of wage. True there are some score of supplemental demands, involving mainly minor matters of working conditions, but they are all of small moment. The real question in the anthracite negotiations, which have been in continous progress since March 15, is that of wages. If here, with no major issue of policy confronting them, the conferees can make no progress in two months—a small, compact conference, with unified leadership on both sides unable to record an inch of progress—what right have we to assume that were the soft-coal controversy stripped of the important question of form of agreement and the check-off, the twoscore fields could make any greater progress; that the miners have conveyed the true situation to the public when they blame the bituminous coal strike on the alleged "broken contract" of 1920?

If you meet with the miners, or don't meet, the result is the same—a strike.

What Facts the Public Wants

THE real cry for facts, apart from mere propaganda, comes from men who want an itemized bill showing where their coal money is going. Even the plumber segregates time from material and gives us an idea as to what we pay for each. But when the householder—and he is the vociferous objector—gets a bill for coal he does not know how much the operator gets, how much goes to the railroad and how much is taken by the coal dealer. It is bulked together. He does not know that the freight is in many instances a bigger charge than the coal itself. He does not realize how much work is expended between the breaker or tipple and the cellar, and how greatly this adds to the cost.

The manufacturer pays his own freight bill and consequently he knows how much he pays for bituminous coal, and wherever the price has not been boosted by extravagant bidding he realizes that the rate charged for the coal is as reasonable as the wage scale permits. When he has men out fighting to get coal he also knows why the price is high and is not surprised. Consequently in times like these the manufacturer utters not a word of complaint, except, perhaps, about railroad charges.

But the householder is not so silent, for he has no knowledge as to what he pays for coal, for freight and for handling. If he had this information he would feel he had the "facts"—the facts regarding his own purchase. It would be in his hands, not in musty bulletins. It would be served to him when he wanted to know about it. It would be short and to the point. At present he does not know that the price doubles and even trebles between the mine face and his cellar. Other articles increase in cost in the same way and many in a much more extraordinary fashion. We are told that oranges in Hayti are sold at ten for a cent—so cheaply as to be practically given away. The price in the United States is to all intents freight, wastage, marketing and handling—and nothing more. The oranges themselves don't figure at all in the price.

If we would question the service of the railroad and retailer it might be well to bethink oneself of the difficulties, labors, costs, lost time, etc., that one would face who journeyed to the mine to get it. But the miracle of transportation on which our forefathers dilated so wonderingly is a matter of course today. Costs of carriage kept falling and we did not realize that they must tend, like all things, to reach a minimum and must increase thereafter if other values became inflated.

Power Drilling

ONE cannot understand why the miner is so unwilling to accept a lowered rate per ton loaded where the electric drill is used. Now that the work of undermining has been committed to the cutting machine, drilling is one of the hardest of mining operations still left to hand labor. Why should miners continue unwilling to allow this part of their arduous work to be undertaken by machinery, as is all heavy labor in other occupations than mining?

In the anthracite region many men already own their own jackhammers. The company supplies the power and the men provide the drill. These men evidently realize that hand drilling is worth avoiding even at some expenditure of money.

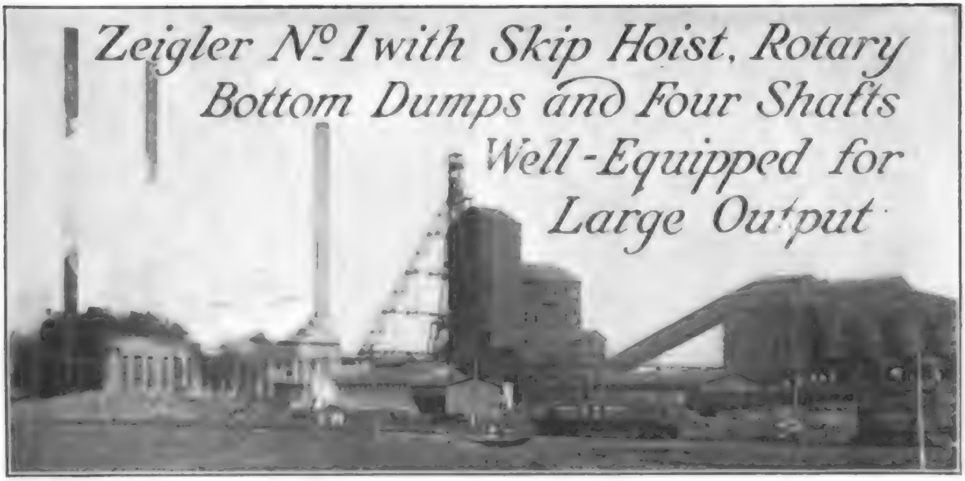
It is in mines subject to dust explosions, however, that the drill will prove most advantageous. When experienced men, who follow instructions, drill all the holes, there will be fewer windy shots. Shotfiring will be less dangerous, and this fact alone is sufficient to commend the drill to the attention of executives.

The high wages some shotfirers receive is proof, if any be needed, of the danger of leaving shots to be fired by men who have no assurance of the depth and loading of the holes they are detonating and who are at the mercy of any unscrupulous miner who, anxious to get much coal with little labor, overextends and overloads his shotholes and uses improper or too little tamping.

With such holes properly placed and of the right length it is certain also that larger coal will be obtained. It is easier to instruct and control one or two gangs of shothole drillers, powder loaders and tampers than to indoctrinate and watch the many coal loaders that every mine employs. Shooting can never be scientific so long as it is done by so many men, among whom are not a few who cannot speak the same language as the mine officials. Perhaps no art of mining takes longer to acquire than that of shooting coal.

It is not difficult, of course, where the man is both experienced and willing and is able to understand English, but where these three qualities are lacking, drilling is likely to be done in a haphazard manner, to be dangerous and to be unsafely and unsatisfactorily done, with a waste of explosives, an undue degradation of the coal, a great risk to human life and a weakening of the roof and ribs of the mine. To mines not now rated as being dangerously dusty, and so not shooting at night, the power drill will introduce night shooting, and greater purity of the mine air during working hours will result.

Zeigler No. 1 with Skip Hoist, Rotary Bottom Dumps and Four Shafts Well-Equipped for Large Output



First Mine in Franklin County, Illinois—Labor Tumult and Disasters End in Sealing of Shaft—Skip Installed at Time of Opening—Bottom-Dump Cars Replaced by Rotary Dump—Car Dispatchers for Mine Trip

By E. W. Davidson*
Chicago, Ill.

IT IS a real honor for a mine to be rated as one of the two greatest producers in the world; but such honors are not attained without travail. Zeigler No. 1 mine of the Bell & Zoller Mining Co., at Zeigler, Ill., has been through that travail. Its early years were full of heartbreak, accident, fire, war and death. It was even closed and sealed for more than a year and given up as hopeless. But the wonderful deposit of coal its shafts tapped was too rich to be abandoned forever. New brains, new capital and a new policy of mine management reopened Zeigler No. 1 in 1910, and since then it has startled the world with its performances and furnished good fuel in ten states.

The history of the mine was tumultuous from the beginning, when Joseph Leiter, a Chicago merchant king, decided there was a fortune in coal for big capital. He employed the best engineering brains he could find, searched Franklin County, in southern Illinois, with a thoroughness hitherto unexampled, and finally sank the first mine shaft in that county. Mr. Leiter was assured he had first-grade coal, so he prepared to mine and sell it on a grand scale.

The top works he built astonished the coal industry. No shaft at that time was producing more than 1,500 tons a day and many a good engineer figured that was about the limit. The Zeigler mine equipment was good for 5,000 tons a day!

"Some day in the life of those structures," said Mr. Leiter, "we'll be taking 5,000 tons a day out of that shaft. We might as well be ready." But under the Leiter management that goal was never attained. Labor trouble, for one thing, started almost simultaneously with the development of the mine. Mr. Leiter proposed to run his mine property as he pleased, mine-union ideas to the contrary notwithstanding. Mr. Leiter figured that if he paid his men well enough and put into the mine everything that the mining engineering profession could think of to make the workings safe and comfortable, he would have no trouble with labor. He guessed wrong—most egregiously. The result was a long controversy that rose from a dispute to a fight and finally to a bloody war.

Determined to win at any cost, Mr. Leiter built a stockade around his little mine town, lined it with armed guards and machine guns and mounted on the headframe in the center of the enclosure a searchlight and more high-power guns. No man was allowed to enter the gates unless his credentials were satisfactory. No man could even approach those gates if daylight or the searchlight beam revealed him to be an undesirable. Battle and bloodshed followed until finally the government and the courts ended it.

Tried to Scare Men Away from the Mines

But the difficulties were not all above ground. Most of them were down in the workings. There, from time to time, everything that makes mining hazardous happened. Superstitions of every sort were fanned into life to make miners tremulous. Fires of known and unknown origin damaged the works and harried operations. Explosions occurred time after time, reaping lives singly, in little groups and by scores. Finally came a series of disasters which defeated the mine operators after a continuous fight that lasted nearly a year.

In 1909 the Bell & Zoller Mining Co. acquired this property, built to be the most wonderful coal mine in the world, but then standing sealed and abandoned.

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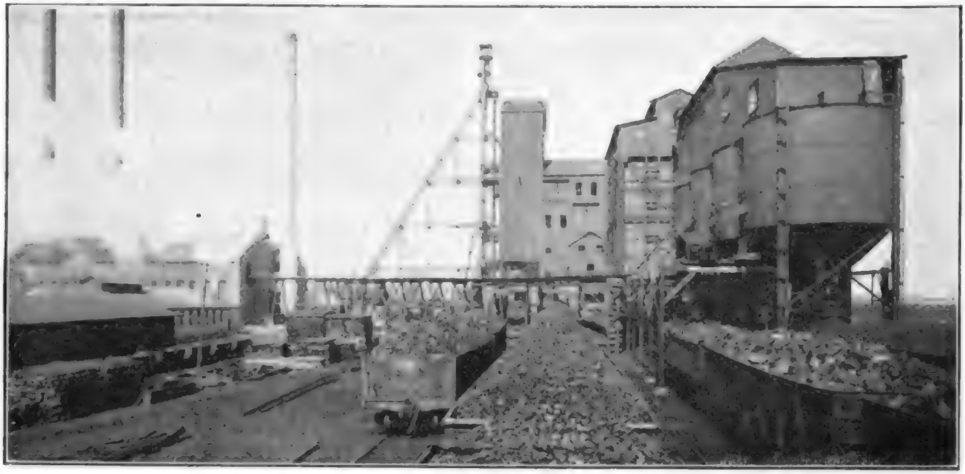
*Western editor, Coal Age.



ZEIGLER NO. 1 MINE AS SEEN FROM THE LOAD END OF THE RAILROAD YARD

The power plant is on the left, the unusual headframe in the center and on the right the rescreening plant with loading bins. Ten sizes of coal are shipped from this mine and 100 railroad cars per day. Coal is carried from the rescreens to the power house along a belt trestle shown in the middle ground.

The new era for Zeigler opened that year, climaxing in the month of March, 1922, when the mine, in a tremendous 27-day production race with its neighboring rival, Orient, twice broke the world's record for daily output only to lose it finally to the other mine. But in those 27 days Zeigler set the world's high mark for monthly production, hoisting 164,109 tons. Mr. Leiter's fanciful 1904 dream of some time getting 5,000 tons of coal a day out of the mine was as nothing compared to the cold facts of the mine's performance that month. It exceeded 5,000 tons every day but one and once touched 7,537 tons.

There was no town at the location of the mine when it was opened. There wasn't even a railroad. A spur had to be constructed from the nearest rail line five miles away. Thus isolated, it was necessary to establish a company village in which every foot of land and every board and nail in the buildings was owned by Mr. Leiter's company. This company plan of ownership continued under the Bell & Zoller régime until 1917, when all the real estate except the mine property itself was placed on the market. Today about 80 per cent of the homes are owned by the company's employees and a number of independent mercantile businesses are running.

Much of the equipment and machinery of the mine as originally installed in the years from 1904 to 1906 is still in operation and "did its bit" during March, 1922, toward setting the world's 27-day hoisting record, which so far overtopped the original estimated capacity. Of course it has been supplemented and the system changed in one notable instance—a rotary car dump was installed at the bottom in 1917—but in the main the mine plant is the original one.

Until June, 1921, power for all operations except hoisting was furnished by two direct-current generators, one a 300-kw. 250-volt machine and the other of 500-kw. capacity. But the distance from the generators to the working face made it almost impossible to maintain voltage. So a steam-turbine driven 750-kw. 2,300-volt alternator was installed and two motor-generator sets, one of 200 kw. and the other of 300 kw. capacity, were established nearer the working faces. Another 300-kw. set is soon to be installed to keep up with the expansion of the workings. With all this equipment functioning, power for the outlying parts of the mine are supplied by the motor-generator sets and for the close-in sections from the original engine-driven generators in the power house.

FOUR SHAFTS SUNK TO COAL INSTEAD OF TWO

In many ways this mine presents striking differences when compared to the average big coal mine. For one thing, it has four shafts instead of the usual two. Its main shaft, built to accommodate a pair of eight-ton skip hoists, is separated by a partition from the man shaft, in which a double-deck cage operates. Thus men are lowered into and hoisted out of the mine without interfering with the movement of coal.

The original plan of making these two hoists sufficient for all purposes was given up because the shafts were too small to accommodate an ordinary mine car. When it became necessary to raise or lower a car, it had to be up-ended and put through the airshaft, which is 600 ft. from the main shaft. This entailed all sorts of arduous toil and made it difficult to handle material. So the fourth shaft—a passageway for material alone—was sunk in 1920 about 100 yards from the main shaft. Thus the mine has its skipway, its man hoist, its airshaft and its material shaft. The mine is made much safer by the presence of the two auxiliary hoists for men and material, and by the same sign the principal business of the mine—getting out the coal—is unhampered.

The idea of hoisting coal by skip instead of by raising the pit cars themselves was novel in the days when the Zeigler mine was built. There were very few skips in the country, but their service in speeding up coal hoisting and in reducing the number of cars essential was even then recognized. The introduction of the skip was considered by many engineers as the last word in mine operation. Therefore Mr. Leiter, who was eager for "last words" for his mine, had the plan adopted.

But there were difficulties. The pit cars, equipped with drop bottoms, were drawn two by two across the open top of a concrete hopper about 30 ft. deep and of 40-ton capacity beside the main shaft. The car bottoms were supposed to spring open at the first pry of a crowbar, dumping readily. They seldom did. A crew of eight men, usually husky negroes, each man armed with a bar and a sledge, did the dumping. It was normally necessary for a man to batter with his sledge the patent triggers along the edge of the car before the bottom dropped open. When the car had been dumped it was pushed on across the hopper to a gang which closed the bottoms by the same gentle sledge-hammer methods. As a result, a repair track leading to a blacksmith shop stood full of cars nearly all the time.

ROTARY DUMP SAVES TIME AND EXPENSE

So in 1917 a rotary dump, operated by compressed air and built from designs prepared by Allen & Garcia, was installed. E. L. Berger, one of the superintendents for the Bell & Zoller Mining Co., believes this was the first underground rotary car dump ever operated. "This dump handles two cars at a time," says he, "and has dumped as many as 1,944 cars in a shift of eight hours."

Nowadays, instead of the "wrecking crew" with sledge hammers, a single operator, handling the compressed-air ram, does all the dumping in far less time, with little effort and with no property damage.

The eight-ton skips in the main shaft are loaded at the bottom of the big hopper, where an operator about 40 ft. below the level of the dumping tracks, opens and closes with compressed air the sliding doors in the mouth of the hopper. Before the installation of the rotary dump, the skips never had hoisted as much as 4,000 tons in any one day. Since then they seldom have hoisted as little as that on days when interruptions were few, and during that feverish month of March when the great mine was exerting itself and when good luck was with it every day, the daily hoist ran from 4,100 to 7,537 tons, with an average of 6,078 tons.

At the mine bottom loaded cars are all handled on one track which crosses a track scale before it reaches the rotary dumper. Two 4-ton shunting locomotives handle the trips as they are brought in. One pushes the loads to the dumper, and the other, on the opposite side of the shaft, pulls the empties away, making up the empty trips on two sidings—one for each half of the mine—from which the main-line locomotives take them back into the workings.

UNDERCUTTING COAL IN THE ZEIGLER MINE

A kerf is being cut by a breast machine, the jack in the rear holding the cutter to its work. There are forty-three of these cutters in the Zeigler mine. Thirty-four of these machines are each apportioned to fourteen loaders and nine are operated by gangs of five men each. The seam in this mine runs from 8 to 11 ft. thick.

MACHINE SHOP FOR MISCELLANEOUS REPAIRS

On the left lathe and drill press, on the right bolt threader, planer and pipe machine. The shop is belt-driven.

There are twenty-seven locomotives in the service of the mine: The two 4-ton shunters at bottom, one 4-ton, two 8-ton and sixteen 6-ton gathering motors and one 15-ton and five 13-ton locomotives for haulage. The maximum grade against the load for the haulage motors is 2½ per cent and the maximum grade for gatherers is 8 per cent. Each gathering motor ordinarily serves two mining machines, no more than fourteen loaders being provided for each machine.

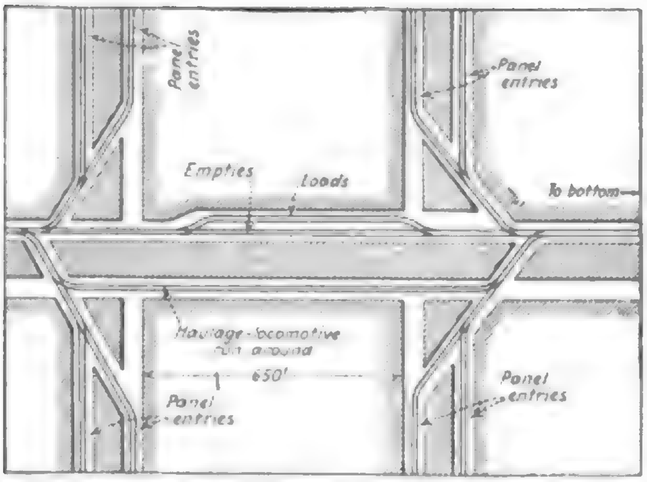
Trip dispatchers at the bottom keep a careful check on the operation of each haulage locomotive. They know the time each motor leaves a parting with a bottom-bound trip, the number of loads in the trip and the time the trip should arrive. Also they mark up the number of empties each returning locomotive takes in and know exactly when that motor should arrive at any given point along the entry. Thus, with the aid of the telephone the dispatcher on duty can spot every locomotive at any minute of the day, and if anything goes wrong with the schedule the pit boss can look up the trouble without delay.

PARTINGS AVERAGE A MILE FROM BOTTOM

The average distance of the partings—all three-trackers—from the bottom is 5,500 ft. The nearest is 4,100 ft. and the most distant, 6,800 ft. They are all located on main entries between panels. A locomotive working between the partings and the bottom handles trips averaging twenty-two cars. The range is from fifteen to forty loads.

The layout of the partings and the system of handling cars through them is designed to get the greatest speed of operation with the least interference and danger. The first parting on the main entry is between the second and third panels. The second parting is between the sixth and seventh panels and so on, so that each parting serves panel entries in groups of four.

A gathering locomotive is assigned to each group of four panel entries. Running between these entries and the parting, each locomotive delivers its loads and removes its quota of empties always at the same end of the parting. Thus while motors work continually in and out of opposite ends of the parting, they never



PLAN SHOWING RUN-AROUND AT EVERY FOUR PANELS

As thus laid out the locomotive always pulls the cars and does not have to push them. It can get around the trip without difficulty by running into the nearby roadway.

interfere and they never have to make flying switches or execute other risky feats of mine railroading.

The partings all have three parallel tracks so that one outside track can be used for making up trips of loads, the center track for empties and the other outside track for passing. This layout reduces trip delays to a minimum by keeping the main lines clear practically all the time and by leaving empties always within reach of gathering locomotives.

Forty-three Goodman breast machines cut all the coal in the mine. Thirty-four of them work territories of fourteen places each and nine cut coal for gangs which average five men.

The tremendous output of this mine, after it has made the trip to the surface, is shipped in ten sizes. Large lump, 6 x 3-in.; "furnace lump," 3 x 2-in.; small egg and mine-run are all loaded by booms at the tipple. All the coal from 2-in. down, which does not go out as mine-run, is carried by belt conveyor to a rescreening plant which makes no less than six sizes. The six are "special stove nut," which is 2 x 1¼-in.; "domestic chestnut," 1¼ x ¾-in.; pea, ¾ x ⅜-in.; carbon, ⅜ and under; inch-and-a-quarter screenings and 2-in. screenings.

In Zeigler No. 1 the coal-mining world sees a property which has negotiated all the hell-and-high-water its bitterest enemy—if it could be said that mines have enemies—could wish to see inflicted upon it, yet it has come through, and today it stands at the pinnacle of its development. Once a death trap and a place to sink fortunes, it has turned out to be a bonanza, and perhaps it has in store still further surprises for the public.

One Hundred Tons of Water Per Ton Mined

FEW, if any, mines pump as much water as the Heidelberg No. 2 colliery of the Lehigh Valley Coal Co., located three miles northeast of Pittston, Luzerne County, Pennsylvania. E. M. Florey, in the *Employes' Magazine* of the Lehigh Valley Coal Co., from which the facts of this article are derived, says that the coal beds lie in a U-shaped basin and at the shaft reach approximately their greatest depth below the surface. This shaft is located at about the center of the small valley in which the colliery has been erected. The beds crop on the floor of the valley and adjacent hillsides, and extensive mining and pillar drawing have cracked and broken the surface.

Though the surface has been ditched so as to carry off the water that falls during heavy rains or melting snows into the creek, much water enters the mines, and, during March, 1920, the heavy rains and melting snows caused a flood in the valley which made the creek back up till the floor of the valley was entirely submerged. The water naturally ran through the cracks in the ground into the mine below, flooding the Red Ash bed.

On March 15 the water in the shaft reached a height of 53 ft. and drowned out the Red Ash pumps. Consequently it was decided to place buckets in the shaft, using the 25x60-in. double engines directly connected to two 8x10-ft. conical drums. Unwatering started on March 14, but more water flowed into the mine than the hoist could remove and the water reached a maximum height of 84 ft. in the shaft on April 29, 1920. After that date the water was lowered, hoisting continuing until Sept. 15, 1920, when the depth of the water on the rail at the foot of the shaft was 7 in. The Red Ash pumps were then started.

The total cost of the six months' flood was: Labor, $17,934.33; material, $12,399.17; total $30,333.50; averaging $259.26 per day for a period of 117 days.

Another drown-out occurred in the Red Ash vein from July 15 to Aug. 13, 1921, and the buckets were used in the same manner as during the previous flood. This cost was as follows: Labor, $5,607.72; material, $4,013; total, $9,620.72; averaging $384.83 per day for a total of 25 days.

In the above figures the cost of steam is not included because it is difficult to ascertain how much of it was used for any one of several purposes. Mr. Florey estimates that the pumps consume 95 per cent of the steam generated. However, the quantity of coal used per day varies but little, and the total cost of operating the boiler plant is practically uniform, amounting to approximately $6,600 per month, which includes 75 tons of coal per day at $2 per ton. The amount chargeable to pumping is 95 per cent or $6,280. This amount should be considered in the total pumping cost.

The accompanying table by months gives the water pumped in gallons, the cost of the pumping and the tons pumped, all per ton mined. It will be noted that the cost of handling water exclusive of steam used was 74c. per ton in 1920 and 59c. per ton in 1921.

WATER PUMPED AT HEIDELBERG NO. 2, 1920 AND 1921

	Gallons of Water Pumped Per Ton of Coal Mined		Cost of Labor and Material for Pumping Water Per Ton of Coal Mined		Tons of Water Pumped Per Ton of Coal Mined	
Month	1920 gals.	1921 gals.	1920 dolls.	1921 dolls.	1920 tons	1921 tons
January	22,115	27,054	072	488	82	101
February	22,052	24,161	083	279	81.8	87
March	17,632	27,327	469	30	65	102
April	22,668	24,735	1 328	406	83.9	92
May	30,719	27,656	2 199	377	114	103
June	36,220	26,098	1 338	257	141	96
July	44,058	37,921	1 63	2 61	163	140
August	32,556	41,710	1 126	1 026	123	155
September	40,133	31,251	2 993	382	149	116
October	29,871	50,710	486	652	107	188
November	25,624	46,956	215	618	94	174
December	25,743	143,185	288	1 44	105	532
Total average per month	27,118	33,388	74	59	100	123

	1920	1921
Total gallons of water pumped	1,459,800,000	1,756,800,000
Total cost of labor and material for pumping water:		
Labor	$24,826 61	$22,120 96
Material	15,191 27	9,230 47
Total	$40,017 88	$31,351 43
Total tons of coal mined	53,838	52,625
Cost of handling water, exclusive of power, per ton of coal mined	$0.74	$0.59

Under What Conditions Are Steam Turbines Preferable To Electrical Units for Driving Auxiliaries?

Reliability More Important Than Economy—Turbines Save Conversion Costs—Independent Steam Units May Release Large Generator at Times of Idleness—Cheap Fuel Makes Heat Balance Less Imperative

WHETHER it is more advantageous to drive the auxiliary equipment of a power plant with steam turbines or electric motors is not a matter to be solved without due consideration of the special conditions at any given plant. Where the heat energy of the exhaust steam may be advantageously applied, as in the heating of feed water or in the warming of buildings, this circumstance strongly favors the turbine. With this machine, furthermore, no double transformation of energy is necessary.

In a mining plant, however, the primary consideration is not economy—reliability is far more important. Continuous and dependable performance of all equipment is an absolute requirement. After this reliability has been assured, economy becomes the next desideratum. The steam turbine has fully demonstrated its reliability, and when properly employed its economy is fair. In dependability of action it far outranks the reciprocating engine, and where conditions are propitious its choice in preference to the electric motor is fully justified.

Although the actual thermo-dynamic efficiency of the small turbine is almost invariably lower than that of the large turbo-generator unit, its direct application to the machine to be driven avoids all electrical generation, transmission, transformation and conversion losses. Any contrast made in the actual number of pounds of steam consumed by the small turbine and indirectly by the motor should take this fact into consideration.

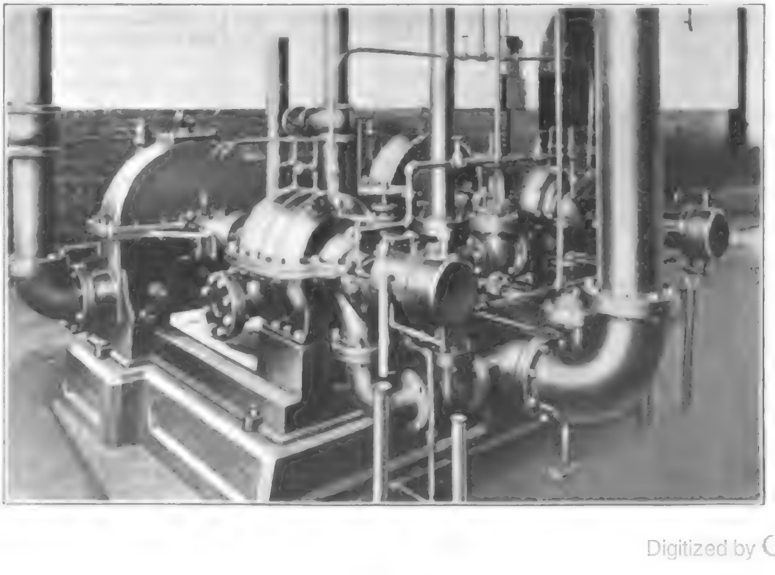
Not infrequently the steam indirectly required to drive a small motor may far exceed the quantity required by a turbine of equal power. Thus on Sundays, holidays or during periods of shutdown a large generator may be run solely to drive the power-plant auxiliaries. If these are actuated by motors at least one generator must be operated. Under such a light load the efficiency of this machine will be low and consequently the quantity of steam actually required to drive, say, the boiler feed pump will be excessive. Under extreme circumstances the losses incurred by electric drive may exceed the consumption of the auxiliaries.

During such periods, therefore, the operation of a large generator for the sake of driving a few auxiliaries is uneconomical. If, however, these machines are actuated by turbines they may be driven entirely independent of any of the main units, which, of course, may be shut down entirely without in the least interfering with the operation of the boiler plant.

Simplicity is a highly important consideration when choosing a small turbine. The various small units scattered around the plant necessarily cannot receive the care and attention bestowed upon the main power units, consequently a single pressure-stage machine is preferred by many. In addition to this, such a unit should have a speed suited to the machine it is to drive. Of course several types of speed-reduction gears are on the market, but these necessarily lower the efficiency somewhat. In one make of turbine excessive speed is avoided by obtaining a multiple velocity effect in a single rigid wheel. This machine also has ample clearance of the buckets.

Boiler Feed Turbine Pumps

Two Terry steam turbines with 4-in. drums driving three-stage single-suction centrifugal pumps at 2,900 r.p.m., which have a capacity of 400 gal. per min. and develop a pressure equal to a 475 ft. lift. They supply water to 3,200 hp. Stirling boilers. Each turbine is a 90-hp. unit and both use steam at 175 lb. pressure, 200 lb. being the maximum. This installation is at the Underwood Colliery, Pennsylvania Coal Co., Throop, Pa.



One of the most important auxiliaries in the boiler plant is the boiler feed pump. Little need be said concerning the advantages of the centrifugal as compared to the reciprocating machine for this purpose. Smaller floor space for a given capacity, absence of water hammer in the feed piping, freedom from packing troubles, simplicity and consequent reliability in operation as well as maintained efficiency are among its cardinal virtues.

Necessarily the engineering economics of the ordinary central station differ radically from those of the mine power plant. At the former the fuel used costs more—sometimes much more—than at the latter, and as a result refinements in the matter of heat balance and economies that are entirely justified in the central station may be monuments of ignorance in the mine plant. In the mine plant the problem of heat conservation is, as a rule, far less delicate than in the large central station. Consequently non-condensing units may often be employed to advantage.

In the large plant where, say, boiler feed pumps both turbine and motor driven are installed, the turbine-actuated units may advantageously be held in reserve, the motors being employed for ordinary operation. Where many generating units are installed they may be cut off or put onto the line one at a time as the demand fluctuates, so that the load impressed upon each generator is at or near its rated capacity, and the machine consequently operates at or near its greatest efficiency. Inasmuch as the steam consumption of the large turbo-unit is comparatively small it is real economy to drive all auxiliaries by motor except those supplying exhaust steam for heating purposes.

The procedure just outlined as governing the driving of boiler-feed pumps is applicable also for draft fans and the like. As at present constructed draft fans are so simply and ruggedly built that they are not likely to fail in service. In many plants a double drive—turbine on one end and motor on the other—through suitable shaft couplings or clutches permits of driving the fan through either agency. This arrangement is regarded by many operators as being almost ideal, but others consider the motor superfluous and pin their faith to the turbine exclusively.

SOME PLACE SEPARATE BLOWER AT EACH BOILER

Some designers strongly recommend individual blowers for each boiler. Beyond doubt these possess the advantage that only one boiler is incapacitated when a blower fails. There is no escaping the logic of this reasoning. On the other hand, the advantage of this arrangement, considering the reliability of the single large draft fan and the fact that the combined power consumption of the several small machines far exceeds that of a single big one, is largely if not wholly counterbalanced. Furthermore automatic control of draft intensity in accordance with the steam pressure in the boilers is much more easily obtained with the single large fan than with a multitude of small ones. In the latter case regulation usually is accomplished by hand and consequently is seldom as close and accurate as may be attained automatically.

So far as economy of heat in a reasonably large plant is concerned, the extent to which steam-driven auxiliaries should be installed is governed by the extent to which the exhaust from them can be utilized either by heating or in an exhaust-steam unit such as a low-pressure turbine. Beyond this point it will be more economical from the heat standpoint to use motor drive. In most up-to-date commercial plants both turbine and motor drives are employed.

In the mine power plant, however, heat economy may not be synonymous with financial economy. In other words, as fuel of a poor quality is being burned at the point of its origin, where it possesses its first and least value, heat may be so cheap that conserving it to the last British thermal unit may cost more than the value of the heat saved. Thus at such plants engineering economics might dictate the driving of the auxiliary or even the main units of the plant non-condensing, turning the exhaust into the atmosphere.

In any case economy in the mine power plant is not so overshadowing a consideration as it is in the vast majority of central stations, the reliability of the turbine as compared with the reciprocating engine giving it preference for installation in the isolated plant. Such plants, as a rule, should have a source of auxiliary power independent of the main units.

AUXILIARIES AT EUREKA ALL TURBINE DRIVEN

As an example of this kind of engineering the Eureka No. 35 plant of the Berwind-White Coal Mining Co., located at Windber, Pa., may be cited. This plant furnishes power for all this company's mines in its vicinity as well as to outside customers. Here the boiler-feed pumps, draft fans, stokers and other auxiliaries are turbine-driven. This is one of the largest and most modern coal-company central stations in the bituminous fields of Pennsylvania.

In the design of mine power plants many varying conditions may be encountered, each combination demanding a different treatment from the others. Thus, where such a plant is tied in with the power lines of a public utility, motor drive on most of the auxiliaries may be entirely justified. Again, where condensing water is available the exhaust from the auxiliaries together with that from a steam mine hoist may advantageously be passed through a low-pressure turbo-generator, a steam regenerator being interposed between the sources of exhaust-steam supply and the machine consuming it. Placing the ventilating fan within the power plant or an annex thereto, where the driving turbine may be under the supervision of the regular power-house force, the exhaust to be condensed or utilized in some manner similar to that just described, also offers interesting possibilities.

It is noteworthy that turbines are being extensively used in the newer mining plants. This is particularly noticeable in new operations in Kentucky and West Virginia. The equipment at these plants almost invariably includes turbine-driven auxiliaries, less frequent use also being made of motor drive. This practice demonstrates probably as nothing else could the present trend in favor of the small turbine, this trend being doubtless the result of the demonstrated reliability of this type of prime mover.

THE REPORT OF the investigation made by the Bureau of Mines at the Pittsburgh Station relating to the value of coke, anthracite and bituminous coal for the generation of steam in the low-pressure cast-iron boiler is being prepared for publication at a later date. The report shows the relative steaming values of the fuels and why the thermal efficiency varies with the different fuels. The draft required with the various fuels is carefully analyzed.

Scheme of Working Suited to Level Bed with Light Cover Has Longwall Work Flanked by Approach Roadways

Modified Longwall Appears to Be Method in Which Most Progress Is Being Made—In System Here Suggested Panels Are Worked Advancing with a Loading Machine and Pillars Are Removed Retreating

BY M. L. O'NEALE
Morgantown, W. Va.

MUCH interest is being shown in attempts to improve present methods of attacking the coal in the bed. The chief objects sought are, briefly, as follows: (1) Quick development; (2) increased production from a given territory, or, in other words, concentration of working forces; (3) complete extraction of the coal; (4) utilization of machinery, equipment and labor to the utmost advantage; (5) safety of the working forces; (6) minimum cost of production, this factor being largely dependent upon and governed by the preceding considerations.

Ordinary room-and-pillar methods are satisfactory in accomplishing the first and the fifth of the above objects and may also, when properly handled, attain a fairly complete recovery of the coal bed. Longwall methods as practised in Europe, for various reasons which need not be enumerated here, rarely have been adopted in this country. The tendency in new methods here appears to be toward modified longwall or panel systems.

General utilization of cutting machines, mechanical haulage with long trips of cars, as well as increased efforts to solve the problem of mechanical loaders, all serve as incentives for seeking improved mining methods. Plant costs have risen, and labor itself, as far as capital invested is concerned, may be regarded in a similar light to equipment. Housing and provision for the needs of labor at a mining plant form items among the largest in plant cost, even though the rents received do not generally yield, by a considerable margin, a fair return on this investment. Consequently fewer men for a given production means less plant investment and decreased fixed charges.

METHOD PERMITTING EARLY COAL PRODUCTION

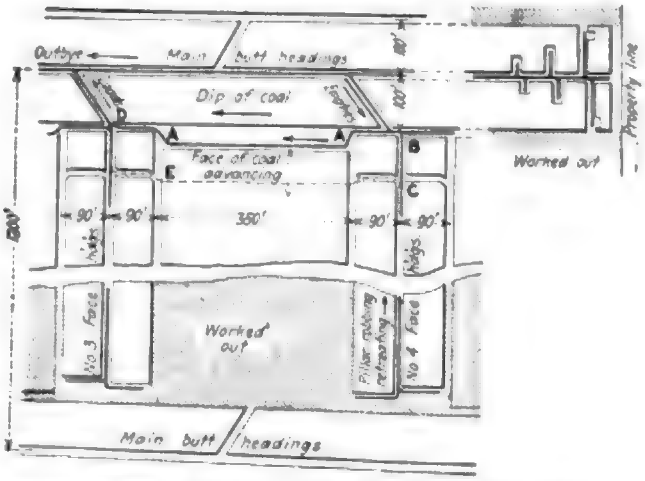
In an effort to solve the problems enumerated in the first paragraph of this article, the proposed system of mining shown in the accompanying illustration is submitted for the consideration and frank criticism of the readers of *Coal Age*.

Employment of this method, like that of all others, is limited to a certain range of physical conditions. It is here laid out for a fairly level bed with light cover, but could be modified, of course, to suit conditions differing radically from those just described.

The main haulage levels are driven on the butts and are shown 1,200 ft. apart. Two aircourses flank each butt heading. From the aircourse which as one enters is to the right hand of one set of butts the panel face is started and carried to the left aircourse on the next set of butts, and from the latter aircourse the face-heading pillars are started back on the retreat. It must be borne in mind, however, that the extraction of any set of face-heading pillars cannot be begun until the panels on either side have been worked out.

The upper section of the accompanying drawing shows the advance of the panel face in its early stages, and the lower depicts the start of the retreat in the face-heading pillars. The dip of the coal bed is indicated and the tracks are so laid out as to take advantage of natural grades. As soon as the main butt headings have been driven beyond the face headings shown and these face headings have been started, the panel face is slabbed from *A* to *A* and the coal loaded on the aircourse track. This track is shifted ahead as the face advances and heavy protecting timbers are set outside it at the corners (*A-A*) to confine the roof break to a line beyond the track. When the face has advanced so far that it is no longer feasible to protect the track in the position indicated, it is moved to a crosscut, as shown by dotted lines on the drawing. The track is shifted in this manner as necessity demands. The standard 80-ft. spacing of crosscuts should meet all ordinary needs of this track. Under some conditions of roof and cover it may be feasible to maintain this track along the face *A-E* much further than here shown, so that it need not be removed until the second or third crosscut is reached.

This system would lend itself admirably to a rapid placing of empties and removal of loads. The locomotive coming in with a trip of empties behind it runs into No. 4 face heading beyond *B*, and backs the empties down toward the working face, where they may be distributed by hand, if the bed dips. It then runs back around the main butt heading to No. 3 face heading, and picks up the loads, which have been dropped down and



SCHEME OF LONGWALL WORKING WITH SIDE EXITS

One of the difficulties in longwall is to provide a means of approach and exit to and from the face respectively. With longwall advancing this is contrived in such a manner that much is expended for packwalling and with longwall retreating it is also arranged but at much delay in development. This scheme avoids the difficulties of both plans by providing for side approaches, and the plan might work well under light cover.

bunched along the track approximately from *D* to *A*. Empties are shunted into the face headings as needed to advance these passages. As these headings need not be kept far ahead of the working face, their advance may be comparatively slow.

If shoveling machines of the type that travel on rails are used, two tracks must be maintained along the working face. If belt or other conveyors are employed along the working face, the track shown from *A* to *A* need not be laid, but instead a track may be placed along the face aircourse from *A* toward *E*. The conveyor then discharges into empties standing on this track.

If storage-battery or cable-reel locomotives are used for gathering, as is not infrequently the case, the electric cable for the cutting machines, the loading machines or conveyor motors is hung only to *A*, and later is carried along the face heading and through the haulage crosscut—for example, to *E*. The mining machine proceeds through No. 3 face heading to the working face, thence across it and out through No. 4 face heading.

When the panels on both sides of a pair of face-heading barrier pillars have been worked out, track is laid along the faces of these pillars at the inbye butt-heading aircourse and the pillars are brought back retreating.

One pillar is kept slightly in advance of the other for convenience in laying the switch. The two tracks along the pillar faces make it convenient for grouping the loads and placing the empties for both places on the same motor trip.

As to ventilation, air traveling the main butt haulage as an intake should ordinarily find its way back through the worked-out panels on the return, but if the butt headings to the property line or other limit are excessively long and there is danger of choking the return, four or more butt headings, instead of three, as shown, should be driven. The number of these passages should be increased also if two haulage tracks are to be maintained, this depending, of course, upon output.

When the butt headings have reached their limit and the coal on either side has been extracted, leaving only the entry pillars along the butts, these may be attacked by splitting with narrow rooms, beginning at the inbye end. As much of these pillars as possible may thus be removed by one of the usual methods of room-and-pillar mining in retreat. The details of this work would be governed, of course, by local conditions.

Milwaukee Plant Exhibits a Drift Toward Use of Coal Dust in Power Plants

COAL operators are noting with interest the tendency toward the use of finer and finer coal and are wondering if the practice will advance so far that the mining officials ultimately will be interested more in getting fine coal than in procuring lump. Should this come about it will revolutionize the whole operation from face to tipple.

As a result of this development the methods of shooting and even of mining might change. The importance of tight mine cars would be emphasized and there would be a distinct disadvantage in topping them, for fine coal would be blown away, making a dangerous dust in the mine, and one of the big arguments for topping, that it encourages the making of coal large enough for that very purpose, would be refuted by changing conditions. The cleaning problems would all be affected by the same change in purpose, and a type of railroad car filled under air pressure might replace the present gondola. It is well to watch this development and if it be a profitable one to the industry to encourage it, for it might prove as valuable a development to the coal mine as was the introduction of the mechanical stoker, furnishing as did that change of combustion methods a market for an otherwise waste product. Already mines in the State of Washington are preparing pulverized coal and in Vancouver Island a plant is being built to prepare it.

FORESHADOWS NEW MARKET AND NEW METHODS

For this reason the following information extracted from *Power*, of April 18, 1922, should be of considerable interest to our readers. It foreshadows not only a new market for coal but new methods for use at our own coal mines.

Laid out for the ultimate generation of 200,000 kw. of electrical energy, 40,000 of which are already installed, the Lakeside plant of the Milwaukee Electric Railway & Light Co. enjoys the distinction of being the first large central station built in this country burning pulverized coal exclusively. The necessity for this plant became obvious in 1915, and the site that it occupies was purchased the following year, but, because of circumstances imposed by the war, work was not begun until late in 1920.

The main building of this plant contains a boiler room, turbine room and switch house arranged in the order named. The coal-pulverizing plant is located in a separate building about 50 ft. in the rear of the boiler room. Between these two stand two concrete chimneys, each of which serves four boilers. On the side of the main building opposite the turbine room is a connecting structure, in which will be located the operating engineer's offices, a blacksmith shop, a pipe shop and a machine shop. The remaining building of the group is the car-dumping and crusher plant, which is on the shore of the lake about 400 ft. away from the pulverizing plant. This structure is built against the lake bluff, so as to take advantage of the slope and obtain a gravity flow for the coal.

Eight water-tube boilers have been installed. Each of these has 13,060 sq.ft. of heating surface, is designed for 300 lb. of working pressure and is operated at 265-lb. gage. They are arranged four on either side of a central firing aisle. They operate normally at 250 per cent of rating, and three boilers are sufficient to furnish steam for one 20,000-kw. turbine, leaving two spare boilers to allow for cleaning and maintenance. Each boiler has a superheating capacity sufficient to raise the temperature of 90,100 lb. of steam per hour from 411 to 611 deg. F., thus obtaining 200 deg. F. of superheat.

The belt conveyor transporting the coal to the pulverizing building is 36 in. wide and 385 ft. long, in this distance rising 91 ft. It discharges into a reversible cross belt conveyor of a similar width that distributes the crushed coal to three parallel conveyors equipped with automatic trippers which pass over the green-coal storage bin in this building and maintain an even supply in the various hoppers. Seven bins of this kind have a combined capacity of 3,400 tons, which is slightly more than 3½ days' supply for maximum operation of all the boilers in the present section of the plant. Beneath these bins run three 12-in. screw conveyors arranged to discharge through automatic scales into three indirectly fired rotary driers 5 ft. 6 in. in diameter and 40 ft. long. These driers reduce the moisture in the coal by means of hot gases from individual furnaces fired with pulverized fuel.

With the foregoing arrangement it is possible to draw coal from any point in the bunker and deliver it to either of the three driers. Furthermore, the coal is weighed just before reaching the driers, which is much preferable to measuring it as it enters the coal bunker, inasmuch as this arrangement permits of a close daily check being kept on the coal consumed in the plant. Each drier is capable of reducing the moisture content in 10 tons of coal per hour from 10 to 2 per cent.

After being discharged from the drier the gas is blown through collectors 14 ft. in diameter. These recover any coal dust carried away by the gases in passing through the agitated coal. Hot dried coal is next transported to the mill-feed bin by means of parallel 16-in. screw conveyors and continuous bucket elevators. Each set has a capacity of 60 tons per hour. This provides for excess capacity in case a breakdown occurs.

Eight mill-feed bins are installed, each holding 25 tons and being placed over its respective mill. Four pulverizing ball mills utilizing air separation and driven by 100-hp. motors have a total capacity of 48 tons per hour. These machines pulverize to such fineness that 75 per cent of their product will pass through a 200-mesh screen and 90 per cent through a 100-mesh screen. With air separation, of course, no screens are needed. The dust formed by these mills is passed through a collector which separates the coal, and the air is taken back to the mill to be drawn through again, thus passing it through a continuous circuit.

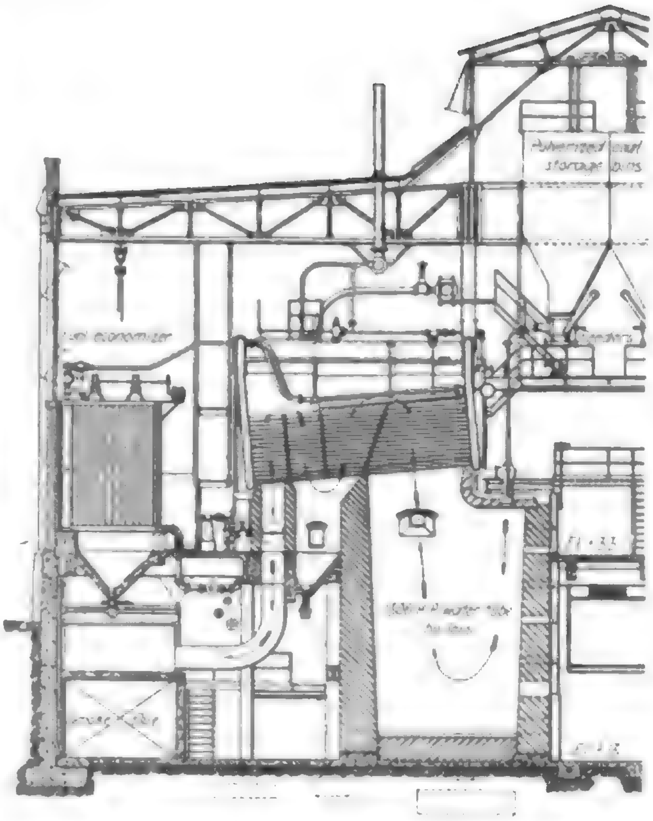
From the collector the pulverized coal is conveyed to a 50-ton storage bin supplying a pneumatic conveying system which transports it to four sets of bins over the firing aisle in the boiler room. One set will hold 150 tons. Coal is fed to each boiler through three duplex vertical burners by means of screw feeders from the overhead storage bin.

BURN 0.85 TO 1.62 LB. PER CU.FT. OF SPACE

Although some horizontal burners were at first installed for experimental purposes, these have now been replaced by burners of the vertical type, and all boilers are fed with fuel from the top of the furnace, the coal moving vertically downward. The furnace volume of each boiler is approximately 7,000 cu.ft. and in certain tests in which capacities ranged from 137 to 236 per cent of boiler rating the fuel burned per cubic foot of combustion space varied from 0.85 to 1.62 lb.

Each boiler is served by an individual economizer having 7,603 sq.ft. of heating surface. This is arranged with a bypass connection to the stack. Each economizer also is equipped with a turbine-driven induced-draft fan. The feed water enters these economizers at approximately 140 deg. F. and leaves them at 225 deg. F.

A system of steam-jet ash conveyors is installed with main runs extending to the furnace ashpit and branches leading to the combustion chambers at the rear of the boiler, also soot conveyor branches under the economizers. Ashes are removed by hand through clean-out doors in the boiler-room basement and fed into the conveyor pipe line. This conveyor discharges into an ash bunker, which delivers the ashes to cars on the railroad track at the east end of the boiler room. In the turbine room the main generating units consist of two 20,000-kw. turbo-generators. These machines operate at 1,800 r.p.m. and deliver three-phase 60-cycle current at 13,200 volts. Steam is taken at 250-lb. pressure and 200 deg. superheat and is discharged at 1 in. absolute back pressure.



HALF VERTICAL CROSS SECTION, LAKESIDE PLANT

A plant which typifies a change in combustion methods in the Middle West. It burns pulverized coal exclusively, crushing its own coal at the plant. It is still a question whether this is the safest, cheapest and best place for pulverizing coal.

The accompanying boiler tests were conducted by the U. S. Bureau of Mines for the Combustion Engineering Corporation and all were personally supervised by Henry Kreisinger, the well-known combustion expert. The high efficiency obtained probably results from the fact that with powdered coal the proper ratio of air to fuel can be easily maintained. Thus small losses are incurred due to excess air and practically no losses are entailed by incomplete combustion or combustible remaining in the refuse.

SUMMARY OF BOILER TESTS WITH PULVERIZED COAL AT LAKESIDE POWER PLANT, BOILER NO. 8

Test No.	Duration Hours	Rating per Cent	Eff. of Boiler and Super-Heater	Eff. of Boiler Super-heater and Economizer	CO_2 in Gases Leaving Boiler	Temp. of Gases Leaving Boiler	Temp. of Gases Leaving Economizer	Kind of Coal
1	42.3	137	83.3	86.3	15.8	434	168	Dried
2	24.0	215	82.6	87.1	14.6	475	196	Illinois
3	20.0	209	82.5	87.0	14.7	482	205	Coal
4	24.7	146	85.4	89.1	16.0	410	204	"
5	24.2	236	79.8	84.6	14.1	496	251	"
6	28.2	139	83.8	88.0	15.1	454	229	Undried
7	25.6	177	83.7	88.0	14.7	466	242	Pennsylvania
8	24.0	175	85.2	89.6	15.1	463	239	& Ohio
9	24.3	204	83.9	88.3	15.1	487	256	Coal
10	24.6	203	83.0	87.0	14.7	474	256	"
11	24.1	244	80.2	85.0	14.0	530	286	"
12	23.9	241	81.7	86.4	14.2	524	263	"
13	24.2	251	81.0	85.6	14.2	531	272	"
14	24.5	130	84.7	88.5	17.1	435	218	"
15	17.6	137	84.4	88.4	16.4	440	221	"

Means Adopted to Remove Keyed Pulleys from Shafts

Description of the Various Keys Used for Securing Pulleys—Causes of Sticking of Pulleys and Keys—What to Do When This Difficulty Occurs—Precautions Taken to Protect Equipment

By G. H. Radebaugh
Urbana, Ill.

KEYS and key fastenings of many designs are used on mine machinery. In most cases the design determines by what mechanical operation the pulley should be removed from the shaft.

One of the most frequent reasons why pulleys stick on a key or shaft is the twisting or rotation of the pulley on the key and the tearing of the shaft by the setscrews in the pulley hub. This causes a burr or uneven place on the shaft, which makes the removal of the pulley or collar difficult. In fact if the pulley is "solid"—that is, not split—it may be necessary actually to drive the pulley from the shaft with a heavy hammer or to pull it off with draw clamps. This will shear off the abraded metal on the shaft. Now and then highly raised burrs or irregular places will not shear or work down as just described when the pulley is being driven over them. In this case the hole in the pulley will be somewhat torn during the withdrawal. If this occurs, the hole must be trued up with a half-round file before the wheel is replaced.

RUST OFTEN HOLDS KEY AND PULLEY TO SHAFT

Rusting of shaft, pulley and key in many cases causes them to stick tightly together. This increases the difficulty of removing the pulley. This can be overcome, however, with a little extra effort.

Before considering the actual operation of pulley removal, as shown in the accompanying illustrations, it will doubtless be of interest to review some of the standard methods of fastening used by manufacturers of mine machinery.

The saddle key, as shown in Fig. 1, is used only when little holding power is required and the cutting or marring of the shaft should be avoided. This key is hollowed out to fit the shaft and holds by friction only. Keys of this design never give any trouble when the pulley is removed from the shaft. They are used on some of the smallest of power-driven machinery.

The flat key, Fig. 2, rests upon a flat seat formed on the shaft to receive it and therefore has a greater holding power than the fastening just described. In repairing much of the small power equipment about a mine this type of key can be used because with it a keyway is not necessary. A flat is merely filed on the shaft as shown in the figure.

SUNK KEY USED WHERE FIRMER HOLD NEEDED

The sunk key, Fig. 3, is most commonly used where the forces to be resisted are large. A channel called a keyway is cut lengthwise in the shaft, and another corresponding with it is cut in the piece to be secured; the key is then fitted to the opening formed by the two keyways. Cutting keyways is normally a machine-shop job, but it may sometimes be done by using a cape chisel and a flat chisel. This is, however, a difficult and trying operation, and is not recommended.

This type of key may be either tapered or straight. To facilitate its removal the taper key sometimes is provided with a head as shown in the figure. This is done when the key cannot be driven out by blows on the point, that part of the key being where it cannot conveniently be reached. This type of fastening is known to the trade as a gib-headed key. The amount of taper given such keys usually is about ⅛ in. per foot of length.

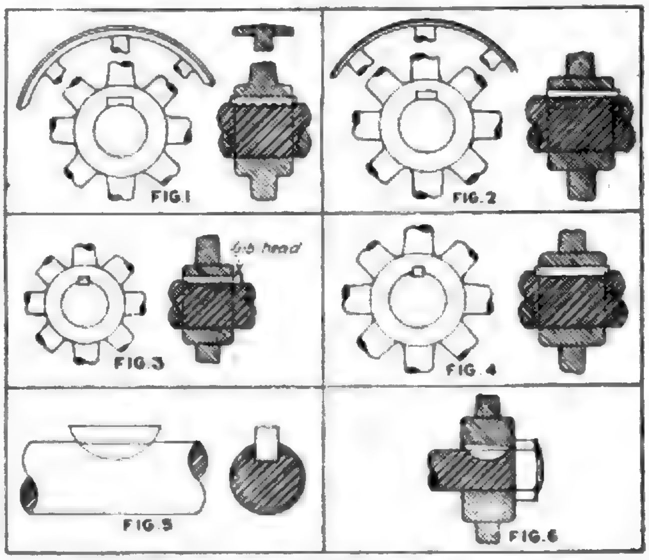
The square key is shown in Fig. 4. It should fit accurately on the sides to prevent it from rolling over in the keyseat, and it should be so constructed as to bear lightly on the top and bottom. These keys are made from square stock of soft steel and it is not necessary to do much filing or fitting if the keyways have been cut properly in the pulley and on the shaft. This type of fastening will be found on some of the larger mine machinery.

The Woodruff key, as shown in Fig. 5, is a comparatively new type of fastening and finds its chief use on tractor engines and equipment auxiliary thereto. It is used extensively also in automobile construction.

This key is made in the form of a disk segment which is placed in a circular-bottomed keyseat sunk in the shaft by a special milling cutter. As the key fits the seat it readily adjusts itself to any variation in the angle of the keyway in the wheel or pulley, as shown in Fig. 6.

The width of the key should be about one-quarter the diameter of the shaft. The depth of the slot cut in the shaft should be one-half the thickness of the key, and the depth of the seat in the pulley should be a little less than half the key thickness. This will permit the fitting of a square-stock key to the key slot.

Before removing a pulley from a shaft, examine the



FIGS. 1 TO 6. FIVE KINDS OF PULLEY KEYS

The saddle key in Fig. 1; the flat key in Fig. 2; the gib-head key in Fig. 3; the square key in Fig. 4; and the Woodruff key in Figs. 5 and 6.

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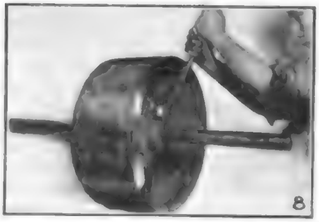
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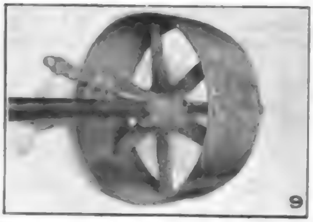
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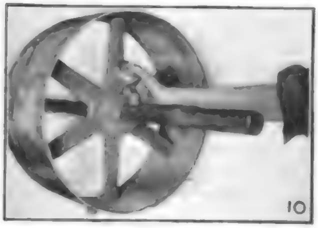
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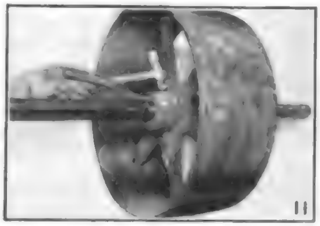
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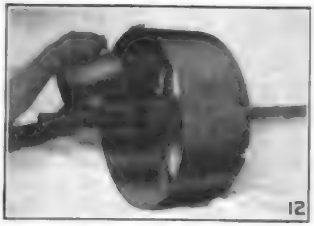
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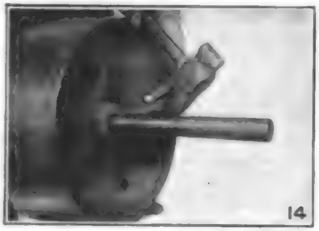
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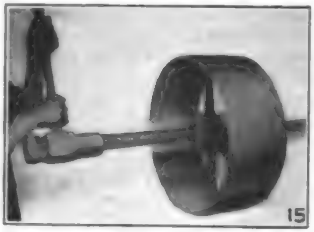
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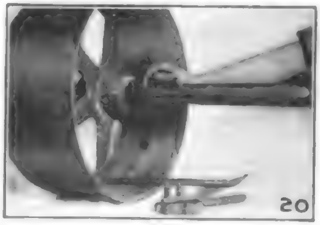
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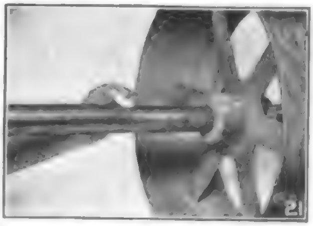
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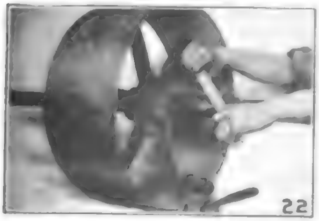
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FIGS. 7 TO 23

Thirteen Methods of Removing Pulleys and Keys

Also views showing the dressing of shaft-ends for the replacement of pulleys. Some of the methods are those normally used and others are suited for use where the removal of the pulley is accomplished with much difficulty.

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shaft surface on which the pulley must slide during removal and notice if it is rusty or scarred. Care must be exercised in driving the pulley over a surface that is not clean and bright. As the wheel bore usually fits the shaft closely, it is good practice to draw-file or scrape a dirty shaft before endeavoring to remove the pulley. After the shaft is clean remove the setscrew, if any is present, as shown in Fig. 7.

Several types of setscrews are used in machine building. They are designated by the shape of their points or heads or of both. The dog-pointed setscrew is used to advantage in pulley fastening. When this type of screw is used the shaft is drilled to receive the dog point. This affords a holding power greater than can be obtained with some of the other types of setscrews because the part held cannot move without the point being pulled from the hole.

CUP-POINTED SETSCREW MOST GENERALLY USED

The cup-pointed setscrew is that most generally used. It is the type shown in use in Fig. 7. Generally two screws are used, and they are normally placed 90 deg. from the key. It also is common practice to place setscrews so that they tighten or bear on the key itself. The holding power of a cup-pointed setscrew depends on the tightness with which it is forced into or against the shaft. Such screws are always made hard—usually casehardened—and so have a tendency to cut into the soft shaft. This is one of the reasons why a wheel so fastened is hard to remove from a shaft after it has twisted or rotated. Any such movement causes the hardened setscrews to tear or score the shaft surface.

Any one of several methods may be employed for drawing a gib-head key from a pulley. The most common is to use the ordinary buggy, wrecking or pinch bar and remove the key as shown in Fig. 8. This operation may be facilitated by using one of the setscrews as a pry block. In the illustration notice the piece of paper between the head of the setscrew and the bar. This is used to prevent slippage. In pulling a key in this manner it is well to bump the bar with the palm of the hand; quick, sharp jars are needed to start the key. If the key loosens under this treatment the rest of the job is easy, but if it refuses to budge, other operations are necessary.

KEY DRIFTS READILY MADE BY BLACKSMITH

Occasionally in a machinist's tool kit may be found the key drift shown in Fig. 9. This tool, however, can be made readily in the blacksmith shop of the mine. It should be given the same temper as a cold chisel. If the key does not release its hold under the action of the bar just described, the next expedient is to use the key drift. Notice in the illustration how the drift is placed in the keyway. It should be remembered that if the key is tapered, it must be driven out from the small end. If a square key has been used, the key drift is the only tool that can be employed. Such a key cannot be drawn in the manner that is used where a gib head is provided. If the key cannot be released by direct driving the problem of its removal becomes more serious and other methods have to be tried.

Thus coal oil may be placed on the rusted surface. Use an oil can filled with kerosene, placing the spout in the setscrew hole as shown in Fig. 10 and using an abundance of the oil. This should loosen up the rusted surfaces if the oil spreads between the shaft and pulley. To cause the oil to penetrate the rust seams, peen around the pulley hub with a light ball-peen hammer as shown in Fig. 11.

This peening or jarring action has a tendency to loosen the pulley on the shaft, permitting the free movement of the oil. Some mechanics perform this peening operation when the key is being drawn with the buggy bar or driven out with the key drift as previously explained.

Another scheme that may be used to advantage is the heating of the hub of the pulley with the blow torch as shown in Fig. 12. This method has its objectionable features, but no doubt in some cases it will turn the trick. This operation can best be performed in the workshop, where the heat can be applied quickly. The flame should be first directed onto the hub just over the keyway. As the heat is being applied the hub should be peened as shown in Fig. 11. The key may then be drawn and removed.

We will now assume that the key has been successfully removed. The next operation is to remove the pulley from the shaft. In many instances this may be done with ease, but in others the pulley seems to be frozen to the shaft, so that its removal presents another problem.

If the pulley is not free on the shaft, and the size of the pulley and shaft will permit it, the pulley and shaft are picked up and treated as shown in Fig. 13. The end of the shaft is allowed to drop on a block of wood, the sudden jar on the pulley in many instances causing it to loosen. A much heavier shock can be applied by this means than with the ordinary hammer.

PULLEY MAY BE RELEASED BY HEATING HUB

If this does not release the pulley, heating may be tried, as was shown for key drawing, the operation being merely repeated. Many jobs will not permit the bumping operation, either because the shaft is too long or has other equipment fastened to it. In such cases the pulley may be driven from the shaft with a sledge hammer and a piece of scrap steel as shown in Fig. 14. The steel bar should, however, be applied to the strongest portion of the hub. Judgment must be used to determine the weight of blow to be delivered by the sledge, as otherwise the hub may be cracked.

In this operation it is wise to support the shaft on boxes or saw horses, so that the pulley will not rest on the floor. Two men are required, one to hold the steel bar and the shaft and the other to wield the sledge. This operation may be reversed. The pulley hub may be backed by a heavy iron or piece of rail and the sledge blows delivered to the end of the shaft as shown in Figs. 15 and 16.

Notice the difference in these two views. It is surprising how often the layman will be found driving directly on the end of an unprotected shaft. The reason why I always use a lead hammer, piece of brass or wooden block on the end of a shaft to receive the blow is simply because I save considerable time thereby. In driving direct on the shaft it is burred over and upset so that it will not pass through the hole in the pulley. It can, of course, be filed down to size in case the end is enlarged, but this requires much time.

If the pulley is located near the end of the shaft it may be removed by using a draw clamp. This device can be made up out of strap steel, two bolts, a few large nuts, and blocks of wood.

As shown in Fig. 17 and 18, two small straps of steel bear against the hub and two blocks of wood.

Washers are used to even up the block support. The bolts as shown pass through these straps and must be long enough to reach to the end of the shaft, where they pass through a large steel strap or yoke, as shown in Fig. 18. The operator tightens up on the nuts which pull directly on the two small straps in the rear of the pulley. An even pull must be applied to each bolt, using a large wrench. If the pulley is not released under this treatment, peen its hub. It is sometimes necessary to draw the pulley entirely off the shaft by means of these clamps. To do this without the aid of specially threaded bolts, an abundance of washers, large nuts, etc., must be employed as shown in Fig. 19.

When the pulley has been removed from the place where it was tight on the shaft the reason for the difficulty is revealed. Notice the rough place on the shaft as shown in Fig. 20. This is the effect of a cup-pointed screw and a loosely fitted key. Before replacing the pulley or other parts the shaft should be smoothed with a draw file and well rubbed down with abrasive cloth.

In refitting a Woodruff key it should be placed in the milled slot and driven to place. This key, as previously described, is freely used in gas-engine construction. In Fig. 21 two of these fasteners are shown intended to hold one pulley.

Generally these keys are used on short bearings. When fitting them as well as when performing the same operation on a square key the height is obtained by draw-filing as shown in Fig. 22. To check this operation and to make sure that no more of the key will be removed than is necessary, lampblack is used as shown in Fig. 23. In order to fit properly a key must not have too much clearance on the top. By using lampblack, proof marks or spots are produced on the top of the key which indicate high places upon it. These high spots are then filed off and the key driven to place.

What Are the Actual Profits Earned by the Bituminous Coal Industry?

DURING the last four years—admittedly the best in its history—the bituminous coal industry operated on an average margin of about 9 per cent on an investment shown by the U. S. Census Bureau's report for 1921 to be approximately $2,000,000,000. This was developed in a statement made by J. D. A. Morrow, vice-president of the National Coal Association, at the hearings of the House Committee on Labor on Representative Bland's bill for a commission to inquire into labor conditions in the coal industry.

On the subject of operating costs and profits in the bituminous branch of the coal industry Mr. Morrow said in part:

"It is doubtful if there is any feature of the production of bituminous coal which has been so beclouded by wild mis-statements of fact as the profits made by the operating companies. It is not long since a former Secretary of the Treasury gave the people of this country the impression that the bituminous coal producers made 2,000 per cent on the capital invested in the year 1917.

"According to the U. S. Bureau of the Census, the total amount invested in the bituminous coal mines of the United States in 1919 was $1,940,000,000. The investment in 1917 must have been but little less. To make 2,000 per cent profit on any such investment would have necessitated making a profit of over $70 on every ton of the 552,000,000 tons of bituminous coal produced in the year 1917. The mere statement of that figure sufficiently shows the absurdity of any statement giving any such impression.

"How little possible ground there was for such a statement is evident in the light of the report of the U. S. Geological Survey showing that the average price obtained by the operators for their total output in 1917 was *only $2.26 per ton.*

All Costs Were Included

"That was the amount received, *and out of that amount all costs of production and sales had to be met before any profit could be figured.*

"In his testimony before this committee, John L. Lewis, president of the United Mine Workers, asserted that profiteering and not wages had been the cause of high coal prices. He presented a mass of partial figures *covering admittedly selected companies*, and by then assuming that the whole industry enjoyed profits similar to those of these particularly fortunate selected companies, he advanced conclusions as to the profits of the producers as a whole which are exaggerated and grossly misleading.

"Mr. Lewis quotes the financial manuals with respect to the net annual profits of eleven bituminous coal companies for the year 1917 in comparison with prior years and derives his conclusion that the coal operators made more than a billion dollars in profits from 1916 to 1919 inclusive *upon the showing of eleven companies out of 5,000.* Any conclusion deduced from such partial information in face of the fact that relatively complete figures from official sources were available to Mr. Lewis, simply indicates a desire on his part rather to make a case than to give the facts fairly and fully to the committee and the public.

"I have prepared for submission to the committee a brief tabulation showing the average price received per net ton, the average cost per ton and the margin per ton for the years 1918, 1919, 1920 and 1921:

	Number of Operating Companies	Production (Net Tons)	Average Price Per Net Ton	Average Cost Per Net Ton	Margin Per Net Ton (a)
1918 (b)	2,481	496,960,342	$2.61	$2.15	$0.46
1919 (c)	548	128,140,333	2.56	2.38	.18
1920 (c)	599	117,251,310	3.58	2.87	.71
1921 (c)	654	133,398,508	3.04	2.94	.10

(a) Margin is not the same as profit. From the margin must be paid all federal income and excess profits taxes and interest on bonds and borrowed money.

(b) From reports of U. S. Fuel Administration.

(c) From reports collected from its members by the National Coal Association. Selling expense is included in cost.

Must Consider Hazardous Nature of Industry

"If these four years are taken together, they show an average margin for the four years of 36½c. per ton. *On the basis of approximately $2,000,000,000 investment in the industry, as shown by the report of the United States Census Bureau for 1921, this would give an average margin of 9 per cent for the industry for the four years, before interest or Federal taxes were paid.*

"In view of the hazardous character of investment in a coal mine, subject to strikes, railroad disabilities, mine fires, floods, explosions, squeezes and adverse geological conditions, a mere investment return of 5 or 6 per cent would be a wholly inadequate compensation for the risk entailed. A much larger percentage of return would be fully justified as a means of enabling the industry to obtain the capital necessary to its sound development and to the proper safeguarding of life and property in the mines.

"Abnormal market conditions incident to the war enabled coal-mine operators to enjoy larger profits than they enjoyed under previous circumstances, precisely as did corporations engaged in every other line of industry. It is equally true that these same abnormal conditions enabled the employees of the mines also to enjoy a higher scale of wages and greater earnings than they ever had before.

"We are now in the process of readjustment. The evidence before this committee conclusively shows that the profits of the coal producers have long since returned to that condition of subnormalcy which is generally recognized to be characteristic of this industry, *but the wages of the miners in all union fields have yet to make the slightest move toward alignment with the readjustment which has taken place in* industry generally throughout the United States."

Problems of Operating Men

Edited by James T. Beard

Mine Ventilating Fans Operating Either Tandem or in Parallel

Relative Yield of Mine Ventilating Fans Operating in Parallel or Tandem—Volume of Air in Circulation Dependent on the Mine Resistance

ONE or two of the statements contained in a paper read before a joint session of the American Institute of Mining and Metallurgical Engineers and the National Safety Council and extracted in *Coal Age*, Mar. 16, p. 445, have arrested my attention. The *Coal Age* article is entitled "Better Ventilation as an Aid to Mining Efficiency."

Under the caption "Booster Fans Boost Only Construction Cost," page 447, it is explained that a fan exhausting from an upcast shaft is of little assistance to another fan installed and blowing air into the downcast shaft of the same mine.

This statement is, of course, quite indefinite; but, for the purpose of argument, I am going to assume a concrete example that is met with frequently in the coal fields, in the ventilation of mines. I will assume that a fan having a capacity of 150,000 cu.ft. per min., at a 2-in. water gage, is exhausting air from a mine in which the downcast shaft is about a mile distant. Now, the mine resistance, in this case, we will say is such that the 2-in. gage created by the action of the fan causes a circulation of only 100 000 cu.ft. per min. in the mine. This fact makes it evident at once that the fan is working below its normal capacity.

INSTALLING A DUPLICATE FAN

In order to improve the circulation, then, we will suppose that a duplicate fan is installed at the downcast shaft. If this second fan, operated as a blower, is run at the same speed as the fan first mentioned, I feel safe in advising that the circulation will be increased to 141,500 cu.ft. per min., and the total pressure on the mine will be equal to a 4-in. water gage, or the sum of the pressures due to the two fans.

It may be argued that when this increased volume of air is passing through each fan, neither of the fans will produce the rated 2-in. gage, the speed of each fan remaining constant. It must be borne in mind, however, that when the fan was handling 100,000 cu.ft. per min., it was operating below its rated capacity and the increase in volume will not, in my opinion, destroy the initial depression produced by the blade tips or the peripheral velocity, which has remained constant.

It is true, as the article states, you cannot place both fans at the exhaust position of this mine and thereby increase the volume. In my opinion, the two fans so placed will not give any greater volume than one of the fans working alone. The two fans installed side by side over a single shaft are working in parallel, whether exhausting or blowing.

The article goes on to state that "The volume of air flowing through the mine can be doubled, however, by the application of twice the horsepower if the ventilating units are independent of each other, . . . each (fan) having its own intake and return." I cannot agree with this statement.

A CONCRETE EXAMPLE

Assume, for example, that a fan is installed over an upcast shaft having a sectional area of 200 sq.ft. and the downcast shaft at the same mine has an equal area. Let us further assume that the air is split at the bottom of the downcast and again united at the bottom of the upcast shaft, thus traversing the mine in two equal splits.

First, assume a single fan exhausting produces 200,000 cu.ft. of air per minute under a 2-in. water gage, the circulation through the mine being in two equal splits, as just stated.

Then, to complete the comparison, assume a partition is placed in each shaft and two duplicate fans are now installed, side by side, over each respective compartment of the upcast shaft. In this arrangement, each fan is provided with its own independent intake and return air-course.

Under this arrangement, certainly, no one will assume to say that the two fans will produce a total circulation of 400,000 cu.ft. per min., with double the horsepower employed. In my opinion, the two fans will produce the same circulation of air in the mine as was originally produced by the single fan.

In closing, let me say I am often asked to quote on a fan having a capacity of 150,000 cu.ft. of air per minute, at a 3-in. water gage; while at the same time I am told the mine is now passing 75,000 cu.ft., under the same gage (3 in.). The fact of the matter is that to double the air in this mine, will require four times the gage, or 4 × 3 = 12 in., which, of course, is prohibitive in American mining practice. It is therefore necessary to change the plan of circulation in this mine so that the airways will permit 150,000 cu.ft. of air to pass under a 3-in. water gage, before a fan designed for that circulation will operate at its normal capacity.

W. J. MONTGOMERY,
Ventilating Engineer,
Columbus, O. The Jeffrey Mfg. Co.

Speed in Locomotive Haulage

Speed of locomotive determined from characteristic curve—Maximum safe speed of a twenty-ton mine locomotive from 12 to 15 miles per hour.

REFERRING to the inquiry of a mining student, relating to the possible speed of mine locomotives, as published in *Coal Age*, Mar. 23, p. 494, kindly permit me to draw attention to one or two points, in the reply to this inquiry, that require some revision. The student asked four questions, the answers to which are given in numbered sections.

The information given in answer to the first question is substantially correct from the manufacturer's viewpoint. The statement made in reply to the second question, however, requires some modification. The question is, "What is the maximum speed of a locomotive on a level track?"

CONSULT THE CHARACTERISTIC CURVE

Assuming a speed rating of eight miles per hour, the reply to this question states, "The speed of the train will vary inversely as the load." Although the speed increases with a decreased load, it will not be found that this increase is in a direct proportion. The only way to determine definitely the speed of a given machine under varying conditions is to consult the characteristic curve of the motor with which it is equipped.

The third question asked, "Can a twenty-ton locomotive be operated at forty miles an hour?" The reply to this question estimates quite correctly that a twenty-ton locomotive would be able to haul an 800-ton train on a level track, at the rated speed, 8 miles per hour, taking the low track resistance of 10 lb. per ton, the estimated 800 tons including the weight of the locomotive.

But the reply then wrongly assumes that the speed ratio of hauling is equal to the inverse ratio of the weight of the entire moving load, including the weight of the locomotive, and reaches the conclusion that it would be possible to increase the speed five times when hauling one-fifth of the load.

By consulting the characteristic curve of the motor driving a twenty-ton locomotive, it is found that the maximum speed at which it is safe to operate this locomotive is twenty miles per hour, which is known as the "balance speed" of the locomotive. However, it will be found that track conditions in the mine will not permit of a speed much in excess of twelve or fifteen miles per hour.

No doubt, the reply to this third question is intended to be purely theoretical, as it has often been stated in the columns of *Coal Age* that the usual speed in mining practice shou'd not exceed eight or ten miles per hour.

GRAVITY ACTS TO ACCELERATE SPEED

Finally, in answer to the fourth question as to the speed developed when hauling on a down grade of 5 per cent, it is estimated that, with a track resistance of 20 lb. per ton, the force moving the train is then that due to gravity, less the track resistance; or $(0.05 \times 2,000) - 20 = 80$ lb. per ton, which is correct.

It is then assumed that "the velocity moving à given mass varies as the square root of the force applied," which I believe is not correct. Within practical speed limits, for mine conditions, the resistance of a trip of cars and the locomotive remain practically constant, making the required tractive effort the same at a speed of 10 miles per hour as at 5 miles per hour.

In this case, the effective moving force due to gravity, above the track resistance, being 80 lb. per ton, that is the accelerating force. In locomotive practice, it is usual to assume that a force of 100 lb. per ton produces an accelerating rate of 1 mile per hour, per second.

On this basis, a force of 80 lb. per ton would produce an acceleration of 0.8 mile per hour, per second. In 10 sec. the speed would be 8 miles per hour; in 20 sec., 16 miles per hour; in 30 sec., 24 miles per hour; etc. In that time it is likely that the train would be wrecked. GRAHAM BRIGHT,

General Engineer,
Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.

Upraising a Shaft in England

Driving an upraise dangerous work—Experience required to insure safety—Description of method employed.

MY own experience in upraising a shaft between two seams, in a mine in England, was recalled by reading the inquiry in regard to the best method of sinking a shaft, which appeared in *Coal Age*, Feb. 2, p. 212. A brief account of this experience may be of interest to readers. It is as follows:

With five other men, I contracted to drive an upraise at Hutton, Henry Colliery, County of Durham, England. The shaft was to connect the Harvey and Hutton seams, separated by 120 ft. of strata.

The said shaft was 6 x 12 ft., inside of the timbers. The strata were almost all hard blue shale, with a few layers of ironstone about an inch in thickness, which commonly occur in the blue-shale formation, in that part of the country. A little more than half-way up the upraise, we encountered about six feet of hard gray sandstone. Underlying the upper seam there was about 18 in. of fireclay.

The idea of driving an upraise may appear to the superintendent who made this inquiry, as being cheaper than to sink a shaft from the surface. Let me warn him, however, that upraising is dangerous work; and if he has had no experience in that line he had better not attempt the job. Judging from the account, he has at least 60 ft. of material that is not self-supporting. In an upraise there is very little space for a man to get out of the way and avoid being caught by a fall.

Again, when the time required to stow this material away in the mine is taken into account, and the necessity of employing experienced men for the work is considered, this method will be found more costly than sinking. In regard to keeping the shaft drained, as has already been suggested this can easily be accomplished by sinking a borehole in the center of the cut.

DANGER ON RETURN TO FACE OF AN UPRAISE AFTER SHOOTING

Speaking of the danger of upraising, when the job at Hutton was finished I vowed never again to undertake the same kind of work, because of the danger it involved. On returning to the face, after firing a shot in an upraise, there is no alternative but to face the conditions whatever they may be.

When going back, on one occasion, I had climbed to within two or three lengths of cribbing, beneath the scaffold on which we worked. At this point, I noticed that a big rock had broken one of the planks, which then gave way letting the rock fall to the bottom. Had I been a little further down the shaft, the rock would have struck and killed me. As it was, I was under a portion of the scaffold that was not broken and escaped, as it were, by a miracle.

The plan we adopted in prosecuting the work is, briefly, as follows: When the excavation, started in the roof of the lower seam, had reached a height of 6 ft. a set of heavy wall plates was placed in position, being supported on four posts, at the bottom. This set was tightly wedged and another set placed about 3 ft. above the first, and rested on short posts between them. The second set was now tightly wedged and lagging boards put in all around the shaft.

This form of cribbing was continued by putting in sets, 3 ft. apart, all the way up the shaft, as the work advanced. The shaft was divided by a line of heavy buntons, at the center, to which were nailed planks forming a solid partition. That side of the shaft was allowed to fill with the rubbish excavated above.

The other side of the shaft was again divided, by a partition, so as to provide an upcast and a downcast for ventilation. Over this portion of the shaft it was necessary to erect a scaffold to support the men while at work. On the other side, they stood on the loose material filling the shaft. When finished this shaft was cleaned out and used to lower the coal from the upper to the lower seam.

WILLIAM DICKINSON.
Lochgelly, W. Va.

Danger in Solid Shooting

Many varying conditions make solid shooting dangerous—Alabama disasters confined to machine mines no proof of safety in solid shooting—Pennsylvania statistics show low death rate.

HAVING read the differing opinions of various writers on the matter of solid shooting, some being in favor of and others opposed to the practice, I want to offer my word as belonging to the latter class. It is my belief that the practice is dangerous and cannot be made safe, as long as present conditions prevail in the mining of coal.

In support of this conclusion, let me say there are too many conditions and circumstances that must be taken into consideration in the blasting of coal, to permit the work being done safely, unless all shots are first properly mined or sidecut.

For instance, the various powders used in blasting are not of the same strength. Again, the nature and hardness of the coal is variable and slips and faults make it necessary to carefully study the situation, before firing a shot in a coal mine. The direction of the coal face, with respect to the cleats and joints of the coal, is another important factor.

These conditions with which the miner must contend are too numerous to permit of the work being carelessly done. Any man who cares for his own safety and that of others will, in my opinion, mine his coal properly before shooting.

CAREFUL SUPERVISION NEEDED TO MAKE SOLID SHOOTING SAFE

It was with some disappointment that I read the allusion of John Rose to the claim made by another writer that, of eight explosions occurring in Alabama and costing five or more lives, within a period of ten years, all took place in machine mines, while the solid-shooting mines in that state were exempt from such disasters.

Mr. Rose remarks, "This statement ought to be convincing proof that solid shooting, when properly supervised by state and mine officials, as in Alabama, is not as dangerous as many would make it appear," and adds, "What is true of Alabama, in this respect, will apply to other states."

The fact that the explosions occurred in machine mines, while solid-shooting mines were exempt, to my mind, is no proof that the shooting of coal off the solid is safe. It only proves that the work, in those mines, was well supervised by competent officials. Can we claim, however, the same careful supervision in all mines, and, if not, what can be expected as the result?

By way of comparison, allow me to refer to statistics in our own state of Pennsylvania. The year 1918 witnessed one of the largest productions of coal in the history of mining in this country. Statistics show that the State of Pennsylvania produced that year 177,217,294 tons of bituminous coal, and but three fatal accidents are reported. Two of these were killed by premature blasts, probably by using short fuses, while the third was the victim of a powder explosion. This coal was all mined by pick and machine. It is doubtful if Alabama can show a similar death rate; namely, one death to 59,072,431 tons of coal mined.

Now, if this great amount of coal can be mined without the danger of solid shooting, why cannot the same be done in all coal-producing states? It may be true that solid-shooting mines can be operated at a lower cost per ton; but how about the accident average? It is well known that each death in a mine costs the company an average of $5,000, which makes it a costly proposition to take any chance in the method of mining employed. Statistics show that from 1898 to 1911 there were 119 deaths due to explosives and blasting in the mines, making an average of nine deaths a year. From 1911 to 1918 there were 58 fatalities, due to the same causes, or an average of 7.25 a year. Assuming the same average of deaths as in other causes, I estimate that 26 of these deaths can be charged to the hazard of solid shooting.

In closing, allow me to say that Pennsylvania coal mines are as modern as any in the world. If solid shooting were safe practice, it would certainly be recognized and followed in this state. I am referring to the bituminous mines of the state, in many of which the conditions are as favorable for solid shooting as elsewhere. My firm conviction is that the practice is unsafe.

———, Pa. MINE FOREMAN.

Inquiries Of General Interest

Timbering in the Pittsburgh Seam

Seam Overlaid With Twelve Inches of Drawslate and Two Feet of Mixed Coal and Slate—Timbers Supported in Hitches Cut in the Ribs Found Expensive—Cheaper Method Sought

WORKING the Pittsburgh seam, in Eastern Ohio, requires considerable timbering. The timber mostly used, in this section, is locust wood. Our specifications state that the timber must be round and not less than 6 in. in diameter, under the bark, at the small end.

The coal averages 5½ ft. in thickness and is immediately overlaid with a drawslate that we will say averages 12 in. in thickness. As the working face is advanced in each place, this drawslate is taken down and we are then face to face with our problem, which is to find some cheap and efficient method of supporting the stratum above.

Overlying the drawslate is a layer consisting of a mixture of coal and slate that, under ordinary conditions, forms the roof in the workings. The nature of this stratum is such as to need support, and it is often necessary to cut hitches in the ribs for the short posts that hold up the collarbeams over the roadway.

It has been our custom to cut these hitches with a miner's handpick. These holes are cut 8 in. wide and the same in depth. The posts supporting the collars being 3 ft. long, the holes are cut 12 in. in the drawslate and 24 in. in the coal.

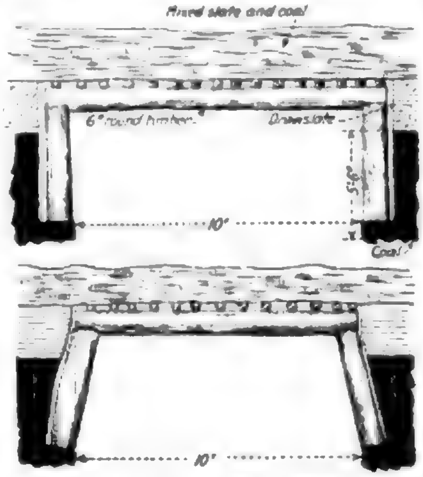
We have found this cutting expensive and it would seem that there must be some more economical method of performing this work or handling the situation. Perhaps there is some device operated by compressed air or electricity that can be employed in cutting out these holes and would be more economical than to use handpicks for that purpose.

In the hope that some of the practical readers of *Coal Age*, in this or in other fields, will be able to suggest something of benefit, we are writing for what information and ideas may be offered. Would it be advisable to use steel I beams or H beams instead of locust? MINE ENGINEER.

Bellair, Ohio.

Some time ago, writers in *Coal Age* discussed conditions in the Pittsburgh seam, with reference to improving the means and methods employed in working that coal. Some of these conditions, it was claimed, were peculiar to the seam, in the Eastern Ohio coal field. At that time, many helpful suggestions were made and we hope the same result will follow the inquiry here presented.

Judging from the sketch sent us by the correspondent, which is shown in the upper portion of the accompanying figure, it would appear that much of the expense of cutting the hitches in the ribs can be saved by shortening the collars and inclining the short posts slightly toward the center of the entry, as shown in the lower portion of the figure.



RIGHT AND WRONG METHOD OF TIMBERING

If this is done, not only will less cutting be required in the coal and scarcely any in the drawslate, but each timber set will possess greater strength and the notches for jointing the timbers be made more effective.

Mining in a Clay Parting

Seam worked by longwall-advancing method—Mining done in clay parting containing sulphur balls — Trouble begins when the gob heats.

KINDLY permit me to describe the situation in our mine, which is causing us much perplexity. For some time past, we have been giving the matter much thought, in hopes of devising some means of overcoming the difficulty. It may be that *Coal Age* or some of its experienced readers will be able to help us solve our problem.

The seam of coal we are working is divided by a 5-in. clay parting containing sulphur balls. The bottom coal is about 4 ft. thick and the top coal 1 ft. in thickness. The seam is moderately inclined and is being worked on the longwall-advancing system.

The mining is done by cutting out the fireclay parting, using for that purpose a radial machine. There is, unavoidably, an amount of slack and fine coal mixed with the clay cuttings, which are thrown back in the gob.

Owing to the presence of the sulphur balls in the fireclay, there has always been a tendency to the heating of this waste, but the situation has been gradually growing worse. We are anxious to learn if there is no method of counteracting this heating.

We realize, of course, that the surest way of eliminating the trouble is to load out all these cuttings, instead of throwing them back in the waste. It would seem, however, that there should be some method of saturation that would be possible or practicable and eliminate the heating of the gob.

MINING ENGINEER.
——————, N. S.

As the correspondent has stated, the true way of eliminating this trouble is to avoid storing the cuttings in the mine. The presence of the sulphur balls (pyrite), in a mine gob, has always been known to cause heating. The heating results from the chemical action that takes place in the disintegration of the pyrite, which is more rapid in damp wet places.

The suggested saturation of the gob, if by water, could only be harmful and increase the trouble, as moisture always causes fine coal and slack to heat in the gob, even in the absence of sulphur. Perhaps, salt would solve the problem. Notwithstanding the well known action of salt in absorbing moisture, it might be well to try the experiment of testing its effect to arrest the heating of a gob.

Readers of *Coal Age* will remember that the use of salt mixed with the stemming, in blasting, was recently discussed (Mar. 9, p. 413). According to all accounts, salt was found to be a very effective means of counteracting the danger of dust in mines.

It is possible that a similar use of salt, if this coal is blasted, might be found to have a favorable effect in reducing or preventing the heating of the gob. At any rate, the experiment, we believe, is worth trying.

It should be observed that the mixing of the salt with the stemming, in blasting, is very effective in giving a good distribution of the salt in the waste. No other means of distribution can prove like effective. The subject is open for discussion.

Examination Questions Answered

Examination Foremen and Assistant Foremen, Fifteenth Anthracite District

(Hazleton, April 11-14, 1922)

QUESTION—*What gases are commonly met with in our coal mines? Name them and give the specific gravity of each gas.*

ANSWER—The common mine gases are four in number; namely, methane or marsh gas (CH_4), specific gravity 0.559; carbon monoxide (CO), specific gravity 0.967; carbon dioxide (CO_2), specific gravity 1.529; hydrogen sulphide (H_2S), specific gravity 1.1912.

QUESTION—*Do you consider it necessary to conduct an air current across the faces of abandoned chambers, on a steep pitch, in a gaseous mine? Give reasons.*

ANSWER—The faces of abandoned chambers, on a steep pitch, in a gaseous mine, should always be thoroughly ventilated. This is necessary in order to keep the face clear of gas, which would otherwise accumulate in such places, gas being lighter than air. A strong air current will often be required to keep these places clear. This is the more important because of the liability of a fall of roof driving the gas down in quantity onto the gangway.

QUESTION—*What provisions would you make in manways of chambers on steep pitches, to prevent workmen falling to the bottom if they should slip in ascending or descending?*

ANSWER—Cross-logs should be set at intervals of 8 or 10 ft. all the way up the manway. These must be supported at one end in hitches cut in the rib, the other end of the timber resting against a good prop set in a foothole in the floor of the seam. These cross-timbers should be set a few inches off the floor, in order to prevent the accumulation of loose material sliding down the pitch. Any accumulation of such loose material would destroy the purpose for which the timbers were put in place.

QUESTION—*What instructions should be given to men in charge of timbering along the main haulage road?*

ANSWER—The men should be cautioned in regard to exercising special care to avoid being caught by passing trips and instructed to arrange their work in a manner not to delay the haulage of coal. They should be instructed to examine closely the condition of all timbers on the road and remove such as show signs of weakness. Care will be required in removing timbers and replacing them with new sets, in order to avoid obstructing the road by a fall of loose material. All timbers must be set so as to give the full clearance between the timbers and passing cars to insure safety.

QUESTION—*What are shafts; and when are they preferred to slopes or tunnels?*

ANSWER—A shaft is a more or less vertical opening sunk through the strata overlying a coal seam, for the purpose of reaching the seam and permitting the coal mined to be hoisted to the surface, or providing an airway for the ventilation of the mine.

Shafts are preferred to slopes when the coal lies at a considerable depth below the surface and does not outcrop at a convenient point on the property, particularly if the coal seam has little or no inclination. When opening an inclined seam that outcrops on the property a slope is generally preferred. A seam of moderate inclination that does not outcrop on the property is often best reached by a tunnel.

QUESTION—*How would you begin the sinking of a shaft?*

ANSWER—The first step is to determine the best location of the shaft with respect to haulage and drainage in the mine and having due regard also to the shipping facilities and buildings required on the surface. Having selected the site and staked out the position of the shaft, a templet of heavy timbers is constructed and laid in position on the ground, which is then excavated within these timbers. The latter are made long enough to extend several feet on either side and at either end of the excavation. The timbers must be well bedded in trenches cut in the floor. As the excavation proceeds, they furnish the support for the temporary headframe used for hoisting, and later form the foundation for the permanent tower and tipple.

QUESTION—*If you were a mine foreman and had occasion to sink a slope what orders would you give the man in charge, regarding the timber to be placed therein?*

ANSWER—All timber set must be inclined slightly up the pitch from a normal to the floor of the slope. The legs supporting the collars must be set in footholes cut in the floor if this is hard. Otherwise, they must rest against long cross-timbers, set in hitches cut in the rib on either side of the slope. All timber frames must be securely wedged and lagging must be used to support any loose top or sidewalls.

QUESTION—*If you were sinking a double-track slope, on a dip of 40 deg., how would you secure the track?*

ANSWER—On this inclination, the track would have a tendency to slip down the slope. In order to prevent this, long cross-timbers must be set at intervals of 10 or 12 ft. and supported in hitches cut in the rib on either side of the slope. At times, short struts can be used as braces, between the crossties on the track and the ribs on either side, these struts making an angle of about 45 deg. with the track.

QUESTION—*Are there any good reasons why square timber is preferred in sinking slopes from surface? If so, give your reasons.*

ANSWER—It is possible to form better joints when using square timbers and the completed slope presents a more uniform shape and makes it easier to install pipe lines and electrical conductors for power and signalling. Square timbers are well adapted when it is necessary to set the timberframes "skin to skin."

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

MAY, 1920, is the date usually associated with the beginning of the recent period of depression. It was in this month that the general level of prices began to decline. During the twelve months that followed, prices on the average dropped 50 per cent. It has required the better part of another twelve months for business to catch its breath after that memorable slide. That this has been accomplished and that business is rapidly adjusting itself to the lowered plane is further emphasized by figures received by the Department of Commerce during the first three weeks of May, 1922.

"Commercial and industrial movements in April, so far as reported," the department announces, "show, for the most part, a steady gain, although some reverses, such as in cotton consumption, are noted. The decline in coal production, due to the strike, has so far caused no interference with industry and very little uneasiness. New records were made in the April building operations and in the March gasoline production and stocks. Iron and steel production held its new level in April and the marked increase in the unfilled orders of the U. S. Steel Corporation indicate more active buying. Prices were steadier last month, with small increases in many commodities. Reports indicate that retail trade is improving.

"Consumption of raw cotton in mills decreased from 518,450 bales in March to 446,843 bales in April. The decline was largest in the northern mills, where the textile strike has curtailed operations; however consumption also declined in the Southern states. April consumption is still well above that of a year ago. Cotton exports totaled 612,654 bales, an increase of 150,000 bales over March.

"Production of pig iron and steel ingots remained practically stationary, with only slight increases over March, but at a very much higher level than at the beginning of this year. Unfilled orders of the U. S. Steel Corporation increased 603,000 tons over the end of March. This is the second month that steel orders have increased after a period of decline lasting nearly two years. Prices of iron and steel were much firmer in April, with increases in practically all lines.

"Gasoline production in March (figures for which are just available) amounted to 472,278,000 gallons, thus establishing another new high record. Consumption also increased over recent months but not in proportion to production. As a result, stocks again increased to a new record of 854,232,000 gallons.

"Building contracts awarded in the 27 Northeastern states amounted to $353,161,900 in April, thus exceeding all previous records. The former high record was reached in July, 1919, when the total was $317,698,000. The total amount of floor space in the nine classes of building for which this is recorded amounted to 58,146,000 sq.ft. in April, compared to 51,957,000 in March and 34,471,000 sq.ft. in April last year. Practically all building materials show increased production.

"Domestic movements of wheat and corn in April were on a lower plane than in either the preceding month or in April, 1921.

"The net operating income of Class 1 railroads showed a marked gain in March, with a total of $83,511,000, compared to $47,771,000 in February.

"Employment in industrial establishments continued to increase in April. The number of business failures declined slightly in April, but the total liabilities rose to over $73,000,000."

Freight Car Loadings 2,537 Less

Loadings of revenue freight during the week ended May 6 totaled 755,749 cars, a reduction of 2,537 as compared with the previous week, according to the Car Service Division of the American Railway Association. This, however, was an increase of 34,027 cars over the corresponding week of 1921, and compares with 843,184 cars loaded for the same week of 1920. Coal loadings for the week totaled 75,410, which was 222 more than the preceding week, but was 69,464 under the same week of 1921 and 96,746 under the corresponding week of 1920.

Idle freight cars for the week ended May 8 totaled 521,746, as compared with 529,658 on April 30, or a decrease of 7,912. Surplus coal cars decreased 8,801 within the same period, the total surplus being 226,276 cars. The total number of coke cars was 5,350, a decrease of 37.

Retail Food Prices Up Slightly

There was an increase of one-tenth of one per cent in the retail cost of food to the average family in April as compared with March, according to the retail food index issued by the United States Department of Labor, through the Bureau of Labor Statistics.

Wholesale Prices Unchanged

Wholesale prices of most commodities in April varied little from those of the preceding month, according to information gathered by the United States Department of Labor, through the Bureau of Labor Statistics. The bureau's weighted index number, which includes 327 articles or price series, registered no change in April from the general price level of the month before.

Automobile Production Booming

Automobile factories in the Detroit district are now operating on a schedule which makes practically certain the creation of a new high production mark for passenger cars for May. The industry is now operating at a speed probably greater than any it has known before.

Reports received by the Department of Commerce showed an increase in production during April. New records were made for the output of both passenger cars and trucks, compared with the preceding ten months for which figures are available. With the reports lacking for only a few small companies, the total April production of passenger cars amounted to 196,512, or an increase of nearly 30 per cent over the March production of the identical firms. The April truck production totaled 21,944, compared with 19,449 from the same firms in March.

Present Strike an Anomaly in Labor Disputes in The Connellsville Coke Region

BY JOHN L. GANS

IF IT were not little short of an industrial tragedy, the present strike in the Connellsville coke region would be somewhat of an anomaly in labor disputes in the district. In practically all essential features it differs from all other strikes that have preceded it in the forty-three years' history of beehive coke making in western Pennsylvania.

In the so-called "big strikes" of 1885, 1887, 1891 and 1894 there was never any doubt, misapprehension or misunderstanding on the part either of employees or employers as to why there had been a cessation of work.

In the present strike there was no notice or warning of an intention to quit work, no demand for higher wages, no protest against a proposed reduction, no list of "grievances" presented with a strike threat as an alternative to a refusal to adjust complaints, real or fancied. Men who have gone on strike cannot give reasons for their action any more cogent than that given by a Slav coker who, in reply to a question as to why he was on strike, said: "We strike account prohibition. We have no good time any more. Give us beer and 'polinky,' we go to work again."

In the early strikes the leadership was entirely native, comprising men who had actually worked from day to day in the mines and coke yards and who had a close at hand familiarity with working and living conditions. Among them were men still living in the region who have since risen to stations far removed from their early activities.

From its very beginning the present strike has been engineered by non-resident leaders, some of whom never saw a coke oven until circumstances and orders from national headquarters of the United Mine Workers of America sent them to the region.

PROFESSIONAL ORGANIZERS LEAD PRESENT STRIKE

The leaders of the present strike are professional organizers, not fellow workers of the coke and mine workers of the Connellsville region. Having no more specific incentive to offer than to show sympathy with the men on strike against a reduction in wages in the unionized fields, the organizers have been more or less hard pressed to devise reasons why the coke workers should lay down their tools.

A strong play has been made to sever the uniformly cordial relations which have existed between the operators and their employees ever since the conclusion of the last strike, twenty-eight years ago. During the intervening time there has not been a labor disturbance except an occasional local difference, which has always been easily adjusted. The necessity has never existed for the workers to make a demand for higher wages, the H. C. Frick Coke Co., to which has been accorded leadership in such matters, having made voluntary advances whenever conditions warranted such action. From 1894, when the first Frick scale was posted, until the outbreak of the war in 1914, there had been thirteen scales which in the aggregate provided an advance of 85 per cent in wages. But two of these scales made slight reductions, which, however, were in each instance fully restored by the next succeeding scale.

Between 1914 and September, 1920, there were nine scales, each in succession giving an advance over the preceding, the nine advances aggregating 125 per cent over the pre-war scale. Since the September (1920) scale two reductions—May 16, 1921, and Aug. 1, 1921—totaling 25 per cent have been made, leaving the scale now in force 100 per cent higher than the 1914 scale and 185 per cent higher than the first scale of February, 1894. The present Frick scale, which has always provided the highest rates of wages for similar classes of labor of any beehive coking region in the world, has been accepted and paid by all the independent producers in the region for the past twenty-eight years.

The scale being entirely satisfactory to the workers and presenting no vulnerable point of attack, the visiting organizers have sought to create dissatisfaction with the method of computing the miners' earnings as compared with the method used in the unionized districts. In the Connellsville region the custom has always been to pay on the basis of measurement, not weight. One hundred bushels of coal mined and loaded into mine wagons is the unit to which the mining rate applies. This system is characterized by the strike leaders as "mining coal by the acre instead of the ton." They have labored zealously to stir up strife on this score by alleging that the miner does not get paid for all the coal he mines because, by the organizers' reasoning, multiplying the known content of wagons (certified by the state mine inspectors) by the number loaded is less accurate than weighing the contents on tipple scales.

In the early days of coke making, before state regulation served as a check upon their cubical content, there were times when, due to the irregularity in size of wagons even in the same mine, the "hump" which miners were obliged to put on their wagons was an issue in some of the strikes. But that condition was righted by the generally accepted rule that wagons be "level full on the tipple." Any reference to this question at this time by the organizers displays their eagerness to foment strife and shows the dire need they have to draw upon ancient history in finding issues for a strike of the coke workers of today.

LEWIS WITHDRAWS OFFER OF STRIKE BENEFITS

During the early days of the present strike assurances were given by the organizers that if the workers joined the union they would receive strike benefits. When this came to the attention of international headquarters President Lewis of the United Mine Workers issued a statement declaring that no benefits would be paid. When the organizers in the coke region were obliged to correct the impression that had gone forth, considerable dissatisfaction developed among the strikers, which made it extremely difficult to obtain recruits for the union.

Finding in many sections of the region a lack of enthusiasm about striking the organizers began to set up the plea that had it not been for the wage increases and better working and living conditions the union had been able to obtain in other mining fields, the workers in the Connellsville region would still be "living in hovels" and "ground down like slaves by the arrogant bosses."

The comfortable homes, fitted with running water and electric lights, free garden plots, fuel delivered at nominal cost, playgrounds, swimming pools, community nurses, baseball, football and basketball teams, first-aid and athletic meets, bands, orchestras, night schools, amusement halls and other welfare and recreation features of the coke towns were, the organizers allege, due to the efforts of the union in other districts and not to any magnanimity or philanthropy on the part of the management of the employing corporations of the coke region. Gratitude for these things, the organizers urged, should be expressed by joining the union and staying out on strike until the struggle is won in the Central Competitive Field. Failing or refusing to do this, the organizers warned, would result in the workers of the Connellsville region being obliged to revert to the working conditions and wages prevailing thirty years ago.

The older employees who have been through some of the big strikes of the region have not been moved by these or similar appeals. They have benefited by the continued efforts of the operators to make life easier and better for the men who toil in the mines and coke yards. While some of the more radical have never accepted the view that these things were being done through a real desire to improve living conditions, the bulk of the men of mature age or long service have appreciated the service in their behalf.

The effect upon the young men of the region, who have never participated in a strike, is quite different from the effect upon their fathers and grandfathers. Until the advent of the troop of organizers now in the region the young men were not accustomed to hear abuse heaped upon the operators. Influenced by intemperate remarks and extravagant statements many of the younger workers have conceived the notion that they have grievances which they feel can be adjusted only through the medium of a strike. That being their attitude the strike agitation has been fostered almost wholly by men who were babes or youngsters at the time the region was last disturbed by a protracted struggle over the question of wages. The local leadership therefore has largely gravitated to the men of less mature judgment and experience.

Anthracite Operators Reply to Miners' Demands

ON MAY 18 the anthracite operators replied to the miners' nineteen demands, the response being addressed to John L. Lewis, president of the United Mine Workers of America; W. J. Brennan, president of District 1; Thomas Kennedy, president of District 7, and C. J. Golden, president of District 9. The reply was as follows:

"Relative to your nineteen demands, to which we have given careful consideration and on the acceptance of which you are still insisting, we herewith make reply:

"If granted, these demands, the majority of which are practically identical with those denied by the United States Anthracite Coal Commission in 1920, would impose an additional burden of at least $170,000,000 annually on an industry already carrying labor costs above the wartime peak.

"It must be obvious to you, from what we have already presented in reply, that your demands cannot be granted without irreparable injury to the industry and its employees.

"To agree upon a wage scale out of line with wages generally being paid for similar service would be as unproductive of satisfactory results as has been the continuance of the high wage rates in the bituminous union fields, which utterly failed to produce adequate annual earnings for those employed therein.

"No agreement between us will accomplish the results we both seek except one which will provide reasonably steady working time at fair wages and the production of coal at a reasonable cost.

"In order to accomplish this result, it is our firm conviction that in the face of the decline in wages and prices which has been taking place for more than a year in other lines of industry, the anthracite industry can no longer continue to pay the present wages, which were established by the President's commission in 1920, at a time when the cost of living and the business activity of the country were at the peak.

"For the year 1921 the average annual earnings of all men coming within the terms of the 1920 agreement who worked in each pay period of that year exceeded $1,800, a figure equalled in no other basic industry. According to the comprehensive survey recently made by the National Industrial Conference Board, anthracite wages show an average increase in actual weekly earnings of 152 per cent above the basic 1914 period, against an increase in the cost of living, as of March 15, 1922, of only 54.7 per cent. The average earnings of mine workers, as computed by us, has been practically confirmed not only by the National Industrial Conference Board but also by the United States Bureau of Labor Statistics.

"The President's commission in 1920 set wage rates in the anthracite field which, in conjunction with the steady employment offered by the industry, produced earnings largely in excess of the increased cost of living at that time. Since the award of the commission, due to the decline in commodity prices, the mine workers have further benefited by the increasing value of the dollar, while both wages and opportunity for employment have declined in other industries. The figures of the Industrial Conference Board show a reduction in the cost of living of 24.4 per cent since July, 1920, and the figures of the United States Bureau of Labor Statistics a reduction of 22.9 per cent during that period.

"It is evident that the present economic situation demands a substantial decrease in wages if a normal production of anthracite coal is to continue and reasonably steady employment is to be provided. Therefore in lieu of the wage program submitted by you, the operators propose an agreement embodying the following terms:

(a) Contract rates shall be decreased 18 per cent below the rates established by the United States Anthracite Coal Commission in August, 1920.

(b) Day rates of men shall be reduced $1.20 per day or per shift below the rates established by the United States Anthracite Coal Commission in August, 1920.

(c) Day rates of boys shall be reduced 72c. per day below the rates established by the United States Anthracite Coal Commission in August, 1920.

"This general wage structure represents an average decrease of approximately 21 per cent, and will therefore fully maintain the purchasing value of the wages as established by the Anthracite Coal Commission in 1920. It provides a minimum rate of 37½c. an hour for unskilled men employed outside the mines, with relatively higher rates for other occupations requiring skill and experience.

"With reference to the term of the agreement, the operators deplore the disturbance to business and the economic loss resulting from frequent controversies and suspensions. In order that this may be avoided, we propose a five-year contract, subject, however, to annual adjustments *as to wage rates only*, as follows:

"On Feb. 1 of each year a joint committee of anthracite mine workers and operators shall meet to adjust wages, to be effective April 1 following, taking into account the following factors as a basis of adjustment:

"(a) Changes in the purchasing value of the wage earner's dollar within each year as determined in the anthracite region and surrounding territory by recognized standard authorities.

"(b) Opportunity for employment offered by the industry.

"(c) Wages and earnings paid in other basic industries under similar living conditions for corresponding service.

"(d) The general economic situation.

"In case no agreement shall have been reached by March 1 in any year, the determination of proper wage rates shall be referred to a commission to be composed of five persons to be selected by the Presiding Judge of the United States Circuit Court of Appeals for the Third Judicial Circuit, the personnel of the commission to be as follows:

"(1) A mining engineer and geologist familiar with mining conditions and coal production but not in any way connected with coal mining properties, either anthracite or bituminous.

"(2) An economist of established reputation who has not been employed heretofore by either party.

"(3) A judge of the United States Court for the eastern district of Pennsylvania.

"(4) A man who has been affiliated with and is representative of the labor movement in the anthracite field.

"(5) A man who by active participation in the mining and selling of anthracite coal is familiar with the physical and commercial features of the business.

"The operators offer the foregoing with the firm conviction that the terms are fair to the employees and necessary to the industry. The periodical adjustment proposed provides for collective bargaining in the first instance, and resorts to arbitration only in case collective bargaining fails.

"The continuation of the Anthracite Board of Conciliation will provide a satisfactory method of settling any dispute that may arise within the period of the agreement.

"A form of contract embodying in detail the proposals contained herein is submitted herewith."

The proposal was signed by S. D. Warriner, W. J. Richards, W. L. Connell and W. W. Inglis, representing the anthracite operators.

Hoover Calls General Conference of Operators May 31 To Avert Runaway Coal Market

By Paul Wooton
Washington Correspondent of *Coal Age*

TO MAKE effective a plan intended to prevent a runaway coal market a general coal-price conference has been called by the Secretary of Commerce to be held in Washington May 31. This announcement by Secretary Hoover followed a preliminary conference on May 18 at which fifty operators, representative of all the non-union fields, voted to use the Garfield schedule of prices of Oct. 29, 1917, as a basis for fixing fair prices for coal. At the same time announcement was made that buying for the larger consumers will be done through committees so as to unify these purchases and prevent the entrance of speculators. In announcing the general price conference Secretary Hoover said:

"The administration expects coal operators in the interim before this conference not to sell coal at prices in excess of the Garfield prices, with such adjustments as are necessary to meet such changed conditions as to costs and other factors as will be fair to the public and to the operators. Furthermore, charges by wholesalers or retailers of larger commissions than were allowed under the Garfield scale, or the resale of coal for speculative purposes, is not fair to the public and the government would like to hear from consumers who have been subjected to higher prices than this basis warrants.

"The vast majority of coal operators and wholesalers everywhere are expressing approval of the action of the administration to curb speculative rises in the price of coal and are co-operating finely with the government to maintain this situation. The action of the producing operators and of the wholesalers in this particular deserves the gratitude of the public, more especially as a large part of the coal produced for many months prior to the strike was produced without profit and even at a loss. The great majority of operating mines wish to demonstrate their sense of responsibility to public interests in this matter.

To Devise Means of Co-operation with Government

"The object of the meeting on May 31 is to devise a means whereby this spirit of co-operation with the government and the public can be organized and made effective."

In opening the public meeting with the operators on May 18, Mr. Hoover explained that the only way to prevent profiteering and pyramiding of prices is to take action before the situation gets out of hand. In an identical situation in 1920, he said, coal sold from $9 to $15 at the mines. When an effort was made to straighten out the situation it was very difficult to handle and while prices were forced down from unjustified levels, the reduction did not squeeze out all of the unjustifiable margin. He frankly explained to the operators that there is no authority to enforce any proposal and that any action taken would have to be voluntary. He did express the opinion, however, that a little self-denial on the part of the operators at this time would result in a great service to the public and redound to the best interests of the operators. He went into some detail to show how distribution could be better regulated and how the unnecessary bidding up of prices could be prevented.

In suggesting the Garfield scale adopted late in 1917 and early in 1918 Mr. Hoover explained that this seemed to be the best basis on which a calculation of a fair price could be figured. He noted that the Garfield prices were based on a 1917 wage scale and that some of the non-union districts are now paying a wage scale in excess of that in effect in 1917. He also pointed out that the Garfield prices range from 15 to 30 per cent above the pre-strike level of prices, but that they constitute as fair a base as could be had readily.

When Mr. Hoover completed his introductory remarks, he called on J. G. Bradley, president of the National Coal Association. Mr. Bradley congratulated Secretary Hoover on taking up the matter before any flurry in prices has occurred. He pointed out, however, that prices must increase somewhat to bring out the maximum production from the fields now in operation and to enable them to throw off the yoke of union domination. He blamed the buyers' panic of 1920 on the irresponsible jobber and the frightened consumer. The public, he said, seemed to lose sight of those really responsible and laid the blame at the door of the operators. Mr. Bradley expressed full sympathy with the plan which Mr. Hoover outlined.

C. E. Bockus was called on next. He stated that the spot price on that day was less than the cost of production in many fields. He said there is no scarcity of bituminous fuel.

C. F. Richardson, president of the West Kentucky Coal Co., attacked the methods of the brokers in bidding up the price. He said the railroads are contributing to the present disturbance in equitable distribution by buying coal to prevent the distribution of the coal which they have stored. He expressed the opinion that the railroads are conserving their stocks to the greatest extent possible so as to be able to use all their coal cars for revenue business when the strike is over and business opens up. He said the operators in western Kentucky had made some money during the war but that all of it had been returned to the public during the past year. He expressed the opinion that there is no chance to prevent pyramiding of prices unless the middleman can be eliminated entirely in times of emergency. He expressed the opinion that the coal should go direct to the consumer. He made the point that no one assails the consumers for robbing the operators when they are forced to sell their coal below cost.

Colonel Wentz Thinks Well of Suggestion

Colonel D. B. Wentz pointed out that in the last thirty days the prices in Virginia have been less than the Garfield prices, but that he regards the suggestion of Secretary Hoover as an excellent one which can be made to operate successfully.

E. C. Mahan spoke of the difficulties of applying fair prices to a large number of small operations, such as is the case in Tennessee, but that nevertheless he is in full sympathy with the principles enunciated by Secretary Hoover.

E. L. Douglass, of the First Creek Mining Co., emphasized the need of bringing the operator and the ultimate consumer closer together. He said the operators themselves could do much to prevent the sale of coal by brokers on consignment if they would insist on selling direct wherever possible. Mr. Douglass' remarks brought a statement from Secretary Hoover to the effect that it is not right for the operators to sacrifice profits which they could get if an intermediary is to appropriate that profit. He gave that as one of the main reasons why he thought district committees could be helpful, as he believes they could require from purchasers the name of the ultimate consumer. This also would enable the committees to establish the extent of that consumers' need. In that connection Mr. Hoover said it might be necessary to build up a larger organization for the purpose of checking stocks. Mr. Hoover also emphasized again that there is no way of compelling anyone to act in the interest of the whole public, except to give such publicity as the government is capable of securing to the refusal of those who will not co-operate.

When some fear was expressed as to the legality of the co-operation proposed Mr. Hoover pointed out that the Attorney General had declared that it is entirely legal to co-operate to hold down prices in the public interest, such an activity in no way coming within the field of restraining trade. He said that the Attorney General would have a representative on the committee in Washington which would act as a clearing house for the regional committees, and if he thought advisable could have a representative on each of the district committees. He declared emphatically that there is no ground for any timidity in discussing such situations with government officials, as it in no way could be interpreted as wrongdoing.

W. G. Ord asserted that a runaway market at this time would be one of the most disastrous things that could happen. He appealed to the newspapers to do their share in preventing a buyers' panic.

E. E. White expressed entire approval of the necessity of regulating distribution so as to insure necessary supplies for all. He pointed out that the navy already had stopped shipments, but he called attention to a large railroad taking large daily shipments from his district when he understood its stocks already were very large. He said he realizes that smokeless coal is not being distributed properly. He said that 97 out of 100 operators in his district want to do all they can to help the public through this emergency. The other three, he said, felt that profits should be gaged over a period of ten years, so that fat years could offset the lean years. Erskine Ramsay said that prices are low in Alabama and that the state is producing only two-thirds of its normal output, but that the operators there will co-operate with the government.

Says Operators Encourage Speculators

Charles Jacobs defended the jobbers. He said operators encourage the speculators because many of them hold their spot coal until 4 p.m., when they accept the highest bid which they have received during the day. He said this policy of opening bids at 4 p. m. cannot be interpreted as serving the public. It was in the course of these remarks that he made the statement that there is some coal on the tracks for which operators are asking $6 a ton. This remark became a storm center of the conference. A number of operators declared that the mention of $6 is unfortunate, as the press is inclined to represent the exceptional price as the average price. Some of the operators expressed doubt if any coal at all had been offered as high as $6. Several appeals were made to the representatives of the press who were present not to regard the statement of $6 coal as applying to the average. Finally Mr. Hoover was asked if he would not make a statement as to the average prices. This he emphatically did, saying the great bulk of prices range from $2.25 to $3. In a few instances prices as high as $4.50 have been traced. He said he knows of no case where coal sold for $6.

Julian Huff suggested that $6 coal should be traced back and its history learned, as well as any other coal selling at exorbitant prices. In this way, he believes, responsibility could be fixed.

It was brought out at the meeting that more tonnage was handled on the Big Sandy Division of the Baltimore & Ohio on May 14 than ever has been handled in one day in the history of the road. It was pointed out, however, that the territory served by that line was forced to limit its output because of the inability of the railroad to handle the maximum amount of coal that can be produced. It was stated that the line has not been built up since the war.

Despite Mr. Hoover's efforts to guide the discussion away from the strike, he was not at all times successful. Several bitter references to terrorism against non-union workers crept into the discussion. The necessity of employing deputies to protect men and property was held to be a legitimate addition to the cost of producing coal. In many cases overhead is being multiplied by the fact that mines are not being worked at capacity.

H. H. Gross, president of the New River Co., of Boston, explained that his mines went on a non-union basis only in December. He said the wage rate was that of the autumn of 1917. He said he was greatly surprised when about 90 per cent of his men walked out as soon as the strike was called.

The question of reconsignment came up and it was shown that the railroads have it within their power to stop the holding of coal for that purpose. Colonel Wentz said that the American Railway Association in 1920 had refused to allow reconsignment more than once, and that action stopped the pyramiding of prices.

After nearly two hours of discussion Mr. Hoover asked for a vote on the proposals to set up the district and national committees, the plan to make direct deliveries to consumers, and to the plan for the consolidation of buying. Mr. Bradley moved the adoption of the proposals. Mr. Ramsey seconded the motion. There was only one vote against Mr. Bradley's motion. It was cast by G. H. Caperton, president of the New River Coal Co. of Charleston. In explaining his vote, Mr. Caperton said such a plan had been tried out and had proven an absolute failure, and as a result he hesitated to enter into anything which smacks of price fixing. He said it was his desire not to be interfered with in the conduct of his business. Mr. Hoover stated that it is remarkable that there should be but one dissenting vote. He said he is opposed at all times to any extension of the government arm into business except when the public has a dominant interest that must be protected. He set forth that all experience shows that the public interest must not be disregarded, or the public will take control. If conditions should arise which would cause the public to take a grip on the coal industry, he said, it would take twenty-five years to loosen it.

After some discussion the operators agreed that the Garfield prices should be the basis for computing fair prices at the mines. A steering committee consisting of J. G. Bradley, C. E. Bockus and S. Pemberton Hutchinson was appointed. This committee then selected a committee to prepare recommendations for the conference. This committee was made up as follows: Virginia—C. E. Bockus; Kentucky—E. L. Douglass, C. F. Richardson, F. W. Wilshire; Tennessee—E. C. Mahan, Alexander Bonnyman; Pennsylvania—Tracey Guthrie, S. P. Hutchinson, Julian Huff; Alabama—Erskine Ramsay; West Virginia—J. G. Bradley, E. E. White, W. D. Ord, T. B. Davis, C. C. Dickinson; Maryland—A. W. Calloway; Washington—Walter Barnum; Utah—Moroni Heimer.

Committee of Coal Men Makes Recommendations

This committee brought out the following report:

"The preliminary conference of some fifty producing operators with Secretary Hoover made the following recommendations:

"That a general conference of operators now producing coal be called to Washington at an early date to consider plans for the better co-ordination of coal distribution and the prevention of profiteering.

"The following plan, or such amendment to it as may be proposed, to be laid before the conference:

"(1) That representatives of that conference be appointed, who, together with representatives of the government departments and the operators, should be a standing committee to advise upon the co-ordination of coal distribution between districts.

"(2) That each district be asked to form a committee that should co-ordinate distribution and to co-operate with the standing committee.

"(3) The various committees should take measures to assure the direct progress of coal direct to the consumer in proportion to his needs.

"(4) The Garfield prices should be the basis for computing sales prices with such adjustments as are necessary to meet such changed conditions as to costs and other factors, as will be fair to the public and the operators."

Those present at the preliminary conference were:

D. B. Wentz, president, Stonega Coke & Coal Co., Philadelphia, Pa.

Erskine Ramsay, vice-president, Pratt Consolidated Coal Co., Birmingham, Ala.

E. C. Mahan, president, Southern Coal & Coke Co., Knoxville, Tenn.

Alex. Bonnyman, president, Blue Diamond Coal Sales Co., Knoxville, Tenn.

L. C. Crewe, president, LaFollette Coal & Iron Co., LaFollette, Tenn.

E. L. Douglass, vice-president, First Creek Mining Co., Cincinnati, Ohio.

R. C. Tway, president, R. C. Tway Coal Co., Louisville, Ky.

C. E. Connor, Elkhorn & Shelby Creek Coal Co., Esco, Ky.

Henry La Viers, Southeast Coal Co., Paintsville, Ky.

A. D. W. Smith, Southeast Coal Co., Philadelphia, Pa.

C. F. Richardson, president, West Kentucky Coal Co., Sturgis, Ky.

S. Pemberton Hutchinson, president, Westmoreland Coal Co., Philadelphia, Pa.

Julian B. Huff, Keystone Coal & Coke Co., Philadelphia, Pa.

T. W. Guthrie, president, Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.

B. Dawson Coleman, Nant-Y-Glo Coal Mining Co., Philadelphia, Pa.

J. B. Brunot, vice-president, Irwin Gas Coal Co., Greensburg, Pa.

W. D. Ord, Roanoke Coal & Coke Co., Landgraff, W. Va.

T. B. Davis, president, Island Creek Coal Co., New York City.

J. D. Francis, vice-president, Island Creek Coal Co., Huntington, W. Va.

W. H Cunningham, Gano-Moore Coal Mining Co., New York City.

H. H. Gross, president, New River Co., Boston, Mass.

J. C. McKinley, president, Richland Mining Co., Wheeling, W. Va.

Walter R. Thurmond, Argyle Coal Co., Logan, W. Va.

E. E. White, president, E. E. White Coal Mining Co., Glen White, W. Va.

G. H. Caperton, president, New River Coal Co., Charleston, W. Va.

W. P. Tams, Guyan Collieries, Corp., Tams, W. Va.

P. M. Snyder, East Gulf Co., Mt. Hope, W. Va.

Walter Barnum, treasurer, Pacific Coast Co., New York City.

A. W. Calloway, president, Davis Coal & Coke Co., Philadelphia, Pa.

Cadwalader Jones, vice-president, Big Elkhorn Coal Co., Ashland, Ky.

C. H. Mead, Mead-Tolliver Coal Co., Beckley, W. Va.

Charles Jacobs, vice-president, Whitney & Kemmerer, Philadelphia, Pa.

W. E. E. Koepler, secretary, Pocahontas Coal Operators Association, Bluefield, W. Va.

G. B. Seyms, manager of sales, Westmoreland Coal Co., Philadelphia, Pa.

L. E. Wood, president, Central Pocahontas Coal Co., Welch, W. Va.

Ed. Griever, Huntington, W. Va. (attorney).

J. G. Bradley, president, Elk River Coal & Lumber Co., Dundon, W. Va.

C. J. Neekamp, secretary, Northeast Kentucky Coal Association, Ashland, Ky.

L. F. Heller, Madeira-Hill Coal Mining Co., Phillipsburg, Pa.

D. E. Poston, president, Poston Consolidated Coal Co., Columbus, Ohio.

F. W. Wilshire, vice-president, Consolidated Coal Co., New York City.

R. G. Wildermuth, vice-president, Lorain Coal & Dock Co., Columbus, Ohio.

U. S. Chamber of Commerce Discusses Coal

VARIOUS phases of the coal situation were discussed by speakers at the annual convention of the U. S. Chamber of Commerce in Washington, May 16-18. Senator Sutherland, of West Virginia, opposed government regulation of the coal industry, as proposed in various bills introduced in Congress.

Eugene McAuliffe, president of the Union Colliery Company, St. Louis, Mo., said that if the present-day labor leaders do not rise to their opportunity one of two things will happen, either labor will slip back twenty years or, what is more probable, a "Cromwellian character will appear to snatch the sword of leadership out of the hands of the men who at best are reactionaries though living in a progressive age."

"Up to a few days ago," he added, "the one point of agreement between mine labor and employers was that the industry was overdeveloped. For some reason best known to themselves, certain representatives of the coal operators have recently decided that no overdevelopment exists. The evidence of such is too well grounded, however, to be successfully disputed. If the industry is beginning to be looked upon as not entirely the property of the coal operators and the mine workers, such is due to the fact that the consuming public are becoming tired of having their individual coal cellars, bins and storage yards periodically turned into prizerings. As a matter of fact the exhibition of fight shown in these recurring conflicts is not equal to the entrance fee paid by the general public.

"Far beyond the refusal of certain coal operators to meet John L. Lewis prior to April 1 stands the importance of the persistent disinclination of many coal operators to report the facts relating to the coal industry, including those pertaining to the labor of which they complain. It is not the province of the government to take over and conduct or to unduly regulate private industries, thereby turning the nation into an army of office seekers without individuality or initiative; likewise the fragmentary and partisan statistics now furnished by the mine workers' organization and the associations of the coal operators are insufficient to satisfy the public as to the real facts surrounding what is looked upon as a rather dark industry.

"We are as a nation coming back. The mismanagement of our coal labor affairs, beginning with our failure to deflate our war and post-war coal-wage scales on April 1, 1921, checked the coming-back process and cost the mine workers and labor at large many millions of dollars. Like all previous deadlocks this one will be broken. What we want is a permanent peace and while a repetition of the happening of Nov. 1, 1919, seems unthinkable, yet it may recur if nothing higher than mob law is to govern our capital goods partnership relations. Reactionary attitude on the part of labor leaders and the averments of the coal operators backed by fragmentary statistics do not offer a sufficient foundation for industrial peace. Our need is for

(a) The enforced incorporation of all labor organizations with provision that such be subject to all of the laws, rules and regulations that govern corporate or partnership holdings of capital, including the payment of federal income and excess profits taxes and the repeal of all laws that place capital labor on a plane apart from capital goods.

(b) The reformation of the United Mine Workers organization including the elimination of the check-off with such revision of policy as will insure a better recognition of the relation the industry bears to our national economic life, and a decent regard for public opinion; the organization to transform its present policy of resistance to greater individual productivity into one of productivity, including the giving of proper encouragement to the installation of labor-saving machinery.

(c) Full recognition on the part of the employer of the fact that the mine worker is entitled to that fair living wage consistent with an American standard of living, regardless of whether he mines coal north or south of the Ohio and Potomac rivers; the employee recognizing with equal force that to earn he must produce.

(d) The enactment of legislation that will insure a full finding of facts concerning the industry.

(e) From the facts so secured the Secretary of Commerce should publish promptly, monthly and annually, the essentials that concern the public including mine labor.

(f) From the evidence so secured the Secretary of Commerce should keep the Interstate Commerce Commission informed as to the ability of the then existing mine development to serve the full coal needs of the nation together with that required for export and bunkerage.

(g) The transportation act should be so amended as to require every railroad desirous of rendering transportation service to a coal mine to secure from the Interstate Commerce Commission a certificate of convenience and necessity before entering or serving same.

(h) Inauguration through the Department of Commerce of a campaign of education and encouragement of the public toward the elimination of seasonal demand for coal, including a reduction in coal freight rates during the storage season.

"The suggestion that incorporated labor pay taxes may seem revolutionary. In practice no taxes need be paid, for the reason that the revenues collected could be easily made to balance the legitimate expenses. It is the measure of accounting required by the government that would furnish the laboring man who is the stockholder the assurance that his contributions were being used for proper purposes and the expenditure of large sums for illegal purposes would then automatically stop.

"With a deflation of mining costs and a resumption of general industrial activity the demand for coal will in three years overtake the present overdevelopment and the surplus men now hanging on the fringe of this great industry will gradually be transferred to other lines of endeavor."

W. R. Coyle, vice-president of Weston Dodson & Co., Inc., discussed "Some New Ideas in Merchandising Coal." He suggested that in the distribution of coal there be organized a complete production and distribution organization made up of a series of units, each one a corporation following the lines of the American Telephone & Telegraph Co. He would have this corporation enter every city as Rexall has entered every city and large town, electing to membership the most progressive and best-located dealer. "Make the dealer a partner in the entire enterprise," Mr. Coyle said. "Buy an interest in his plant, and sell him an interest in the production of the material he will merchandise. School him to follow a general merchandising plan. Make him a part proprietor and an interested owner in those mines which supply the stock on his counters."

Mr. Coyle pointed out that in our present scheme of organization there is a bigger waste of capital than anyone realizes. A consolidation of this kind means that from 17 to 22 per cent of the capital now invested in production and distribution would be released for productive industry.

"In many states and towns the two or three dealers in coal and building material are being solicited by salesmen from ten coal houses, a like number of cement companies, lumber salesman, and a countless number, an army of perhaps 200 men per month, and the business of the town will not pay the expenses of six of these men," said Mr. Coyle.

Railway and Coal Men in Convention in Chicago, Discuss Fuel Problems

FUEL problems of the railroads and the relations between railroads and the coal industry were thoroughly discussed this week at the fourteenth annual convention of the International Railway Fuel Association in Chicago. The convention, which was held in the Auditorium Hotel, was notable for the number of coal men in attendance. The association, always recognized as an active one in matters pertaining to coal, performs a real service to both the coal industry and the railroads by offering first rate opportunity for close exchange of ideas mutually valuable.

Some of these mutual problems were handled "without gloves" in the convention. C. G. Hall, general manager of Walter Bledsoe & Co., coal operators, of Terre Haute, Ind., for instance, minced no words when he spoke on the question of "Assigned Cars for Railroad Fuel." In his address he pointedly blamed the railroads of the country for many of the ills of the coal industry, declaring that if they would hold sufficient coal-handling equipment to take care of the country's coal production during peak production, "the troubles of the industry would soon vanish, as the market would be stabilized and prices would hug the cost of production so closely that the number of active mines would be reduced and confined to a capacity to meet the actual peak requirements." He declared that the railroads, through an interpretation which the Interstate Commerce Commission has chosen to put upon the Transportation Act of 1920, are now able to discriminate in old-time fashion against unfavored mines in days of car shortage.

PROPOSES RULES GOVERNING CAR DISTRIBUTION

Believing that he should be constructive instead of merely critical, Mr. Hall proposed three rules to govern distribution, interchange and movement of open-top cars during periods of rail congestion and peak demand for coal, which he said would afford the desired relief to the public and at the same time enable railroads to protect their fuel supply without undue confiscations of commercial shipments. His three rules are these:

(1) A railroad may designate and assign cars (owned or leased by it) for company fuel loading, but such cars, when placed at a mine for loading, must be counted in the pro-rata share of cars to which such mine is entitled, based on its rating.

(2) Cars owned or leased by a foreign railway may be designated and assigned for its company fuel loading and shall be given to the mine to which consigned if such cars do not exceed the pro-rata share of cars to which such mine is entitled, based on its rating. All cars so assigned and placed at the mine for loading must be counted in the pro-rata share of cars to which the mine is entitled.

(3) Open-top cars must be loaded only in line for home, and if no such loading is available they must be immediately returned empty to home line at nearest junction.

In his opening address to the convention on Monday, L. W. Baldwin, vice-president of the Illinois Central Railroad Co., preached the "count-the-scoops" doctrine of fuel conservation on a railroad, declaring that scrupulous conservation not only pays the railroad in reductions of fuel bills but in good will from a public that is entitled to expect its carriers to cut transportation costs. T. H. Watkins, president of the Pennsylvania Coal & Coke Corporation, fresh from much activity at Washington and throughout the East in the strike, spoke on government and the coal industry, and F. S. Peabody gave the convention some astonishing figures on the cost to the coal consumer of idle days at the country's coal mines.

Mr. Watkins declared railroad purchasing agents "fail lamentably" in their responsibilities when they shift large coal contracts from mine to mine to save a few cents a ton. This disorganizes the coal industry, causing labor troubles and market disturbances, and upsets industry generally, thus injuring the railroads. Coal buying should be a "matter for executive management."

Mr. Watkins blamed railroads for part of the overdevelopment of mines in that the roads often encourage unnecessary operations in order to get freight. He surprised some by saying that the coal industry doesn't need stabilizing as badly as other industries. Considered nationally "there is no other industry wherein production is as uniform between summer and winter." For nine years, he said, soft-coal summer production has been above 45 per cent of total annual production.

Stabilizing of coal production and demand should be gained by eliminating strikes from railroads as well as at mines. Markets cannot be steadied by storage, he said. There is seventy million tons storage capacity now in the country, but buyers will not use it. Mr. Watkins is against government intervention, but favors investigation. Probing would prove today's main trouble is that the coal industry was saddled with too high wages by the Bituminous Coal Commission and unions were too shortsighted to modify them. This encouraged overdevelopment of non-union mines. He presented figures to show that the miners can stand a heavy wage cut. He declared district, not national, agreements should end the strike.

The convention began Monday morning and continued until Thursday afternoon. A report of the convention in more detail will appear in *Coal Age* next week.

Blizzard Defense Opens Case; Motion to Direct Verdict of Not Guilty Overruled

PRESENTATION of the case of the defense began May 19 when Judge Woods, in Circuit Court at Charles Town, W. Va., overruled a motion to direct a verdict of not guilty in the trial of William Blizzard, a mine-union official charged with treason as the leader of the armed march last summer against Logan County non-union coal strongholds.

Judge Woods held that there has been evidence sufficient for consideration by the jury that war existed and had been levied by the armed men. He also reviewed the argument that treason against a state was impossible because of the division of authority between State and Federal Governments and held that this position could not be maintained.

Declaring that it was necessary to determine whether the purpose of levying war was private or against the state, the judge held that if the purpose where to coerce the government or the state to adopt or abandon any public policy it would be war against the state and would mean treason. What the purpose was, Judge Woods ruled, ought to go to the jury for determination.

That Blizzard went to Logan County last summer as a result of requests by army officers while members of the union of which he is an official were fighting against state and county officers was testified as the first step of the defense.

Two witnesses for Blizzard, both testifying as to his presence in Charleston at times when the prosecution's testimony showed him on the march that preceded the Logan battles, were called. One, William Petry, vice-president of District 17 of the union, also said he sent Blizzard, a sub-district president, among the fighting men to induce them to return home, acting on the request of Brigadier General H. H. Bandholtz.

H. W. Houston, chief counsel for the defense, in opening his case, said it was conceded that Blizzard was in Logan County while fighting was going on there, but that he was sent there as a result of federal officers' request and that during the time state testimony showed him to have been leading some of the marchers he was at Charleston or at his home in St. Albans.

Brigadier General H. H. Bandholtz, who was expected to be the chief alibi witness for the defense, failed on the stand, May 22, to recollect some of the things the attorneys are said to have hoped he would substantiate. The General testified that Blizzard went with him to Racine on Aug. 27, but he did not recall seeing him after they talked with some of the armed men there. He could not recall conversations with the vice-president of District 17, United Mine Workers, on Sept. 1, as a result of which the defense contends Blizzard was sent to Blair and other Logan County towns, not to assist the miners in their attacks on state and county forces but to get them to go home.

Seventh Week of the Coal Strike

EDITORIAL REVIEW

THERE was little change in the coal-strike situation during the seventh week of the strike. Production continues at between four and four and a half million tons per week, mainly from Middle and Southern Appalachian areas. Prices continue their upward trend, although there is some prospect that this tendency will be checked through the efforts of Secretary Hoover of the Department of Commerce. Mr. Hoover will confer in Washington, May 31, with a gathering of all coal operators whose mines are still producing, to discuss ways and means of effecting a direct from-mine-to-consumer distribution, designed primarily to reduce the opportunity for speculative purchase and holding of coal by middlemen. This is the only activity in connection with the strike that is as yet credited to Washington.

Practically all the operating mines in West Virginia and in Kentucky have orders for their maximum production. Demand for coal from eastern Kentucky and from the Kanawha high-volatile field considerably exceeds the ability of those fields to supply. On the other hand, Alabama and southwestern Virginia could handle more orders than they have on their books. The same is true of most mines in Tennessee. Operations in Utah, Colorado, New Mexico, Texas and Washington are being limited by lack of market.

A few cases of distress have been called to the attention of officials at Washington. These are confined to small utilities and to two or three small railroads. Thus far, no single case of a manufacturing plant being short of coal has been reported to Washington. During the last two weeks some trouble has been occasioned by car shortage on the Louisville & Nashville R.R., but steps were taken promptly to remedy that situation. By transferring cars from the railroads serving mines in the union fields it will be possible, it is believed, to give all operating mines 100 per cent car supply.

That certain large wholesalers recently have been sending out circulars so worded as to alarm consumers and to contribute to a buyers' panic has been established by government officials who are in possession of copies of this material.

Illinois Operators Make New Effort To Get Action Out of Farrington

FOLLOWING out their general policy of making it plain to everybody that they want to settle the mine strike by separate agreement, the operators of Illinois made another move last week. On May 18 they wrote Frank Farrington, president of the Illinois mine workers' union, stating that they were tired waiting for a conference with the miners and asking him where he stands. A day or two before, W. K. Kavanaugh, president of the Fifth and Ninth District Operators' Association, wrote James J. Davis, Secretary of Labor, asking him to declare himself in favor of separate agreements by states between miners and operators. At the end of the week no answer to either letter had been announced, though it appeared, from a statement made by Mr. Farrington's secretary, that the Illinois mine leader had been writing John L. Lewis, president of the United Mine Workers of America, recently, asking in vain for permission to make a separate deal in Illinois.

The Western operators watched with interest the price conference last week of Secretary Hoover of the Department of Commerce with the non-union operators of the South and East. Many words of commendation for Mr. Hoover's program were heard about Chicago.

The letter to Mr. Farrington, dated May 18, and signed by Rice Miller, president of the Illinois Coal Operators' Association; W. K. Kavanaugh, president of the Fifth and Ninth District Operators' Association, and H. C. Adams, president of the Central Illinois Operators' Association, is as follows:

> Not only Illinois operators but that part of the public who are consumers of Illinois coal would like to know just where you stand with respect to the present mine-labor situation which is keeping Illinois mines idle and just what you propose to do about it. Their sense of public responsibility will not permit the Illinois operators to omit such inquiry at this time.
>
> In answer to previous inquiries of the Illinois coal operators, made prior to the expiration of our last Illinois wage agreement, you advised us in a telegram under date of March 15, that your District Executive Board were of the opinion that President Lewis still had a "lingering hope" that in some way, by his direct effort or with governmental assistance, a four-state wage conference might be secured and a general, countrywide wage agreement entered into.
>
> At your invitation also the Joint Executive Board of Illinois operators and miners had a meeting in Chicago on March 29, 1922, in order that you might technically meet the requirements of the 32d section of the wage contract that was to expire two days later. Illinois operators then advised you of their entire willingness to proceed at once with negotiations for a new wage contract, but were again told that the Illinois Miners' Executive Board could not, under existing circumstances, enter into such negotiations or indicate a date when such conference might begin, although again every possible assurance was given of your determination to maintain such proper relationship as would permit adjustment of another contract should an emergency, within your judgment, arise that would warrant prompt action.
>
> Meanwhile, all those efforts which you suggested Mr. Lewis was to make have been undertaken and apparently with neither success nor prospect of securing such conference as he desired. Illinois mines have now been idle for seven weeks. Not one move has been made by you or your associates to even undertake negotiation for a new wage scale on which work might be resumed, nor to the best of our knowledge is anything of the sort in prospect. We can see no reason whatever that would justify itself with the public for your attitude or lack of action in the premises, and it is on this account that we would appreciate hearing from you promptly.

Anthracite Operators Propose General Wage Reduction and Five-Year Contract

THE long looked for reply of the anthracite operators to the demands of the mine workers was made public at the session of the joint subcommittee of operators and miners on May 18 in New York City. The operators propose that contract rates be decreased 18 per cent; that day rates for men be reduced $1.20 per day or per shift and that rates for boys be reduced 72c per day. They also propose a five-year contract, subject, however, to annual adjustments as to wage rates only.

It also is proposed that on Feb. 1 of each year a joint committee of mine workers and operators meet to adjust wages to be effective from April 1 following and that in case no agreement shall have been reached by March 1 the matter be referred to a commission of five persons, to be appointed by the Presiding Judge of the United States Circuit Court of Appeals for the Third Judicial Circuit.

The reply of the operators was taken under consideration by the representatives of the miners on the joint committee, and later was considered by the wage scale committee of the union, which had been summoned to New York City in anticipation of the reply being received.

The operators' reply to the miners' demands, in full, will be found on page 890 of this issue. The producers published their reply in the form of a 4-column advertisement in the newspapers of New York City, Monday, May 22.

The joint subcommittee arranged to meet again on May 23, when the miners were formally to make known their reply to the operators' answer to their demands, which they have announced to the press that they will reject.

Private and Co-operative Mines Ordered Closed by Ohio District Miners' Union

STRICT orders were issued May 12 by the Ohio organization of the United Mine Workers, closing every licensed mine in Ohio. Previously many mines, especially those owned and operated by brick and clay-products plants, were permitted to operate upon the understanding that no coal was to be mined for commercial purposes. Many of the brick plants in Ohio have their own coal mines and operate only to furnish fuel for their own use. The new order becomes effective in eight days in order to allow brick and other clay products now in kilns to be finished. Previously orders had been issued by the Ohio organization closing all mines in the Uhrichsville and Tuscarawas fields and also in the eastern Ohio field, where a number of mines were supplying public utilities and schools and hospitals. The new order, if obeyed, will cause the closing of every mine in Ohio that is now being operated on a co-operative plan or that is not a stripping plant.

Rabbi Wise Accepts Invitation to Probe Conditions in New River District

THOMAS L. LEWIS, secretary of the New River Coal Operators Association and a former International president of the United Mine Workers of America, has sent a letter to the Rev. Dr. Stephen S. Wise, of the Free Synagogue of New York City, inviting him and four others to make an investigation of present conditions in the New River district in West Virginia in order to ascertain at first hand whether the 80,000 miners and their families are facing starvation, as has been charged.

The letter, which was in reply to statements made in New York City by representatives of the miners in West Virginia, is as follows:

"In an advertisement appearing in the press of a public meeting at the Town Hall on Thursday, May 18, it is stated that you will preside. In the advertisement in queston as well as in appeals for funds that have been sent broadcast by the West Virginia Miners' Relief Committee, which is in charge of Thursday night's meeting, it is represented that:

"'Eighty thousand men, women and children are facing a slow and frightful starvation' in the coal fields of West Virginia.

"'That there is a deliberate purpose on the part of the coal producers to starve workers into submission to a wage scale below the cost of living.'

"The whole tone of these communications is to the effect that all right-thinking men should come to the aid of the West Virginia mine workers.

"For me to assert that the picture so drawn is untrue and wholly misleading—especially as a basis of an appeal for relief funds—would merely be for me to set up my statement as against that of someone else. If there is any substantial foundation for the statements made as to the condition and the treatment of West Virginia coal miners it is, in my opinion, most desirable that you and other public-spirited citizens should find out the truth for themselves.

"I was at one time the International president of the United Mine Workers of America. I spent twenty years of my life as a coal miner, and am still interested in seeing the miners get justice. At the present time I am living in Charleston, W. Va., and am thoroughly familiar with conditions in the coal fields of that state. I say without any hesitation that there is no necessary starvation, or even privation, among the coal miners of West Virginia. Even under the depressed conditions of the coal industry and of industry in general there is enough work at good wages to enable every miner in West Virginia to make a living.

"Which of these descriptions—the Relief Committee's or mine—is correct?

"To enable you and any disinterested associates you may select to find out the truth I am authorized to extend to you and, say, four associates an invitation to visit the West Virginia coal fields and find out exactly what are the living and working conditions of the miners.

"I cannot, of course, speak for any district except the New River, but I would call your attention to the fact that it is this district where conditions are alleged to be the worst. I am confident, however, that any investigators associated with you would receive a thoroughly satisfactory welcome in other districts. The New River Coal Operators' Association will pay all the expenses of such a visit of investigators to the New River coal fields and place every facility within its power at your disposal for finding out in your own way what the conditions really are.

"This invitation is extended in the most serious spirit. The coal operators of the district I represent have been assailed as human monsters. That is how I would describe them if what you and your associates have said about them is true. It seems to me that it is your duty to the public as well as an obligation demanded by a sense of fairness to find out what are the conditions in the West Virginia coal industry, and then to tell the truth about it in your own way."

To this, according to press reports, Dr. Wise replied:

"We will accept Mr. Lewis' invitation, but will undertake the investigation with independent funds, for we would not touch a penny of the operators' money."

Utah Aliens Ordered to Give Up Their Guns

AS a result of Governor Mabey's visit to the Utah coal camps, all strikers in Carbon County who are not citizens of the United States have been ordered to hand in any weapons they may possess to Sheriff Kelter by noon of May 22. If they refuse, it is highly probable militia will be ordered out. This is one of Utah's methods of settling its coal-mine strike disorder, which is believed to have been caused principally by foreigners. The Governor is invoking a state law which prohibits aliens from carrying arms. The coal camps are quiet again but the situation is tense. Many union organizers have been sent to Utah from other states. They appear to have made some progress.

Dinner to Rail Executives Taken to Mean Rate Cut Has Become Political Issue

THE President's dinner, May 20, at which the railroad executives were guests, is conclusive evidence to many traffic men that railroad rate reduction now is a political issue. There is a widespread belief in Washington that the President called in the railroad executives after he had learned that the Interstate Commerce Commission could not see its way clear to order any substantial reductions in freight rates. There is a tendency to criticize the commission for its failure, after over five months' consideration, to get together on a definite finding rather than create a situation where the President practically has been forced to take a hand in rate making.

A committee of seven of the executives held a two-hour session Monday, May 22, with the Interstate Commerce Commission. Although a formal announcement made by Daniel Willard, one of the conferees, merely said the meeting was "for the purpose of discussing the rate situation," the session generally was regarded as the first step toward possible compliance with the President's request and toward carrying out the agreement made at the White House meeting. Mr. Willard's statement said that another meeting would be held on Thursday.

Missouri Retailers Caution Public Against Getting Panicky Over Coal Situation

THE public of Missouri will be cautioned against getting panicky over the coal situation. This advice from coal dealers was authorized at the second annual convention of the Missouri State Retail Coal Merchants' Association, at St. Louis, May 16. The association, with a membership of 147 dealers scattered all over Missouri and across the Arkansas and Illinois lines, adopted resolutions touching upon the strike and coal prices, opposed government intervention in the strike, urged railroads to prepare for an unusual demand for coal-carrying equipment immediately after the strike, declared for a state law requiring that each retail dealer in coal be licensed and required to maintain an office, scales and storage space for coal the year around, a law protecting the public against misrepresentation of coal quality by any wholesaler or retailer, and that a penalty be assessed by law against "any dealer selling coal at a loss at any time to a certain number of customers, knowing that when times of stress come he can assess the amount of such loss against the unfortunate buyer."

H. F. Shrankler, of Sedalia, was elected president. W. K. Kavanaugh, president of the Fifth and Ninth District Operators' Association of Illinois, was the principal speaker at the evening session.

Retail Coal Merchants Hear Profiteering Condemned; Strengthen Their Association

By E. W. Davidson

THREE HUNDRED retail coal men of the United States, at the fifth annual convention of the National Retail Coal Merchants' Association, in Chicago, last week, heard profiteering by operators and jobbers denounced in the well and familiarly known "no uncertain tones," heard Senator William H. King of Utah inveigh against government interference in business, resolved that the battle against crookedness in retail coal selling and against government and public coal yards must go on, and girded up their loins for more intensive association work during the coming year.

There was no loose talk at the convention about prosperity, present or future. There was little time spent in meaningless oratory or "high diggings." Instead the convention stuck pretty closely to brass tacks, making it clear to the members that the retail coal business is seriously endangered by the unprincipled hangers-on and by public misunderstandings of one sort or another. To meet the first it affirmed anew its declaration of principles adopted last year at Richmond, Va., thus pledging the members to uphold it, and to counteract warped public opinion it decided upon a course of publicity aimed to educate those writers and editors who do most to instruct and inform the people.

Homer D. Jones, of Chicago, was elected president of the association to succeed Roderick Stephens, of New York City.

Both L. W. Ferguson, president of the Chicago Coal Merchants' Association, and Marshall E. Keig, sales manager for the Consumers Company of Chicago, declared on the first day of the convention that non-union coal operators have already boosted their prices so high that those prices are bound to be reflected in retail coal bills, and that, as usual, the sins of the operator will draw upon the head of the retailer the condemnation of the public.

"Three weeks ago," said Mr. Ferguson, "the producers asked $1.75 for Pocahontas coal. Today they ask at least $3.50. If we pay that price, we are compelled to pass it on to the consumer."

In his address on trade associations, Executive Secretary Joseph E. O'Toole, of Philadelphia, who was employed a year ago by the association partly because he understands the machinations of official Washington, said trade associations in this country are doing a tremendous work in combating unfair competition and that by no other means can a trade properly defend itself. He reviewed some of the practices that afflict the retail coal business, such as the entrance of newspapers into the business to sell coal at less than cost plus a fair profit.

He said the association expects to work closely with Mr. Hoover in whatever program of helpfulness may be worked out.

The finance plan adopted provides that local, state and sectional organizations be assessed $5 per member per year, payable quarterly; that individual memberships at $25 a year be accepted where there is no affiliating local or sectional organization, and that the Canadian Retail Coal Association be admitted to membership for $500. This, it is estimated, will raise $40,000 a year. It is hoped to get $20,000 more by solicitation among the larger distributors of coal.

Speaking on the sore question of what to do about the wholesaler or operator who short-circuits the retailer in retail trade, Mr. Stephens, retiring president, declared: "When you once know that a producer wants to deal both from the bottom and the top of the deck, quit playing with him. I am not advocating a blacklist. That is illegal. I am not suggesting concerted action, for the same reason. But each dealer should make an intelligent estimate of the situation and take appropriate action. A jobber who deals unfairly with a retailer in Kansas City is no fit man for a Chicago retailer to do business with. The concern that disregards the established retailer in Chicago should not be supported by the retailer of Boston or New York, and so on."

Dealing with the matter of government and public fuel yards, the association's special committee reported that the government's yard in Washington is losing 75c. on every ton it delivers, or a total loss of $150,000 a year. Its estimate that it could deliver coal for $1 a ton was shot to pieces by the association's investigation, which set the actual cost at $1.78. The investigation disclosed that the yard administration, in its $1 a ton estimate, had made no provision for selling, credits, collections, executive salaries, advertising, postage, audits, bad debts, state taxes, federal taxes, excess profits taxes or for profits. The convention went on record in support of a bill now in committee at Washington abolishing the government yard.

At the banquet of the association on Friday evening F. S. Peabody, chairman of the board of the Peabody Coal Co., appeared, declaring he could not bear to stay away from any gathering of coal men for he would rather be with them than with any other class of people on earth, and that he had invited himself to make a speech. He was greeted warmly by the banqueters and roundly applauded when he had finished a few graceful remarks about coal men and their honor in business. Senator King, the speaker of the evening, took occasion to pay high tribute to Mr. Peabody's genius and business ability and said he is trying to put through a plan to have Mr. Peabody play a leading rôle in the future development of Utah's natural resources. The Senator declared government control and regulation of business is fundamentally wrong.

Cincinnati Meeting Studies Lake Situation

AT a meeting of railway interests, lake shippers and coal producers held May 16 at the Sinton Hotel, in Cincinnati, consideration was given the exchange situation as well as to proposals to hasten some of the season's tonnage to Lake Erie points. E. M. Whitaker and J. B. Parrish, of the Chesapeake & Ohio R. R., said that, judged by the rate that coal has been moving to the upper lakes, there was a possibility that considerable coal would go forward all-rail next winter. H. M. Griggs, of the Ore & Coal Exchange, supplied figures to show the necessity of taking the situation in hand. After a meeting of the joint conference the coal men got together, W. J. Magee, general manager of the Carbon Fuel Co., acting as chairman. C. R. Moriarity, representing the Kanawha interests, was elected chairman of the committee to investigate the situation with the following other members: C. R. Braggins, of Columbus, Ohio; C. J. Neekamp, of Ashland, Ky., and W. E. Tissue, of Macdonald, W. Va.

Engineers to Discuss Unemployment

PROGRESS in the nation-wide study of unemployment and business cycles now under way through thirty member societies will be a principal topic of discussion at the next meeting of the Executive Board of the American Engineering Council of the Federated American Engineering Societies to be held in Pittsburgh May 26 and 27. The movement to establish a National Department of Public Works, the proposal for an International Engineering Congress, patent legislation and many phases of Federation development will be considered. President Mortimer E. Cooley will preside and a large attendance of board members is expected.

ONE OF THE MOST curious things about American politics is that without a single historical exception a partisan is invariably a member of the other party.—*Washington Post.*

Production and the Market

Weekly Review

PRICES advanced last week an average of 51c. The volume of free coal is restricted, as the large non-union shippers are committeed on their May output. Those who have coal for sale are the ones who are following a policy of getting the top of the market, selling from day to day and at most from week to week.

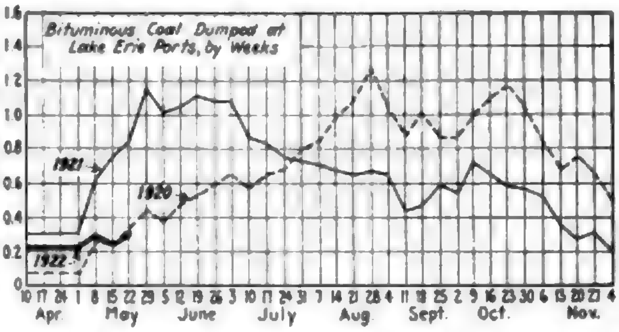
Efforts at Washington to hold the price down have but little affected the market quotations but have really introduced a general hesitation that may be the forerunner of an easing of prices. Several weeks must elapse before it will be possible to appraise the effort of the government to hold the market down. The meeting of non-union operators in Washington on May 31 will bring out more fully the plans of the Secretary of Commerce and the opposition of any who have no faith in such procedure. It is recognized that distribution plays an important rôle in controlling price, and in this the jobber, who now is speculator as well, is a factor. He is the key to distribution for the great majority of small producers.

POOLING BY MIDWEST BUYERS CHECKS SPECULATION

In the Middle West pooling of buying by railroads and other large consumers is holding the market in check. Speculators found that much of the tonnage which they had shipped in on consignment was not readily taken and some low figures were taken to dispose of these cars. This steadying influence has been exerted in the face of a distinctly bullish market and early this week reduced Chicago prices on western Kentucky coals. Smokeless dropped 75c. per ton.

Competitive buying at Hampton Roads has brought Pool 1 coal up to $7.15@$7.50, f.o.b. piers, and the high-volatile price practically parallels this. New York, Philadelphia and Baltimore continue to take heavy tonnages by water and Southern coals also are moving all-rail over a widening range of territory.

New England and the Northwestern markets remain comparatively quiet. In the former, stocks are heavy and although the supply has been shortened, consumers are not eager to buy at the ruling quotations. The rising prices have caused rehandlers in that section to be more cautions about commitments. The Northwest has been stirred only slightly by the unusual orders placed with the docks at the Head-of-the-Lakes for shipment to Lake Michigan points and to distant rail destinations. Lake dumpings proceed at the rate of 250,000 to 300,000 tons weekly but much of this coal is being shipped to other lower Lake points.



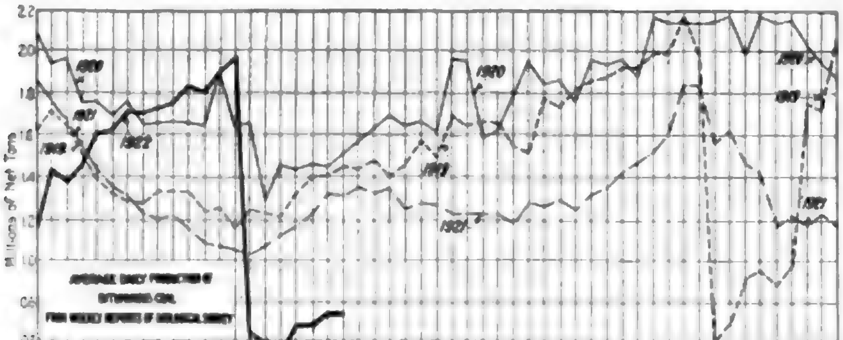
Coal Age Index of spot prices of bituminous coal increased 42 points to 303 on May 22. Spot prices are now at their highest point since late in 1920.

Production of soft coal is clinging close to four and a half million tons per week. Over the country as a whole the number of no-bills is steadily declining and in many sections does not exceed the number which is usual in normal times.

BITUMINOUS

"Having risen close to the 4,500,000-ton mark, the production of soft coal shows no further increase," says the Geological Survey. "From the returns so far received it is unlikely that the output of last week will equal that of the preceding one. Production of anthracite remains practically zero.

"The revised figures for the sixth week of the strike



Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1922	1921
Apr. 29	4,175,000	6,984,000
May 6 (b)	4,164,000	7,391,000
May 13 (a)	4,421,000	8,009,000
Daily average	737,000	1,335,000
Calendar year	153,115,000	142,551,000
Daily av. calendar yr.	1,361,000	1,267,000
ANTHRACITE		
Apr. 29	5,000	1,945,000
May 6	6,000	1,633,000
May 13 (a)	7,000	1,938,000
COKE		
May 6 (b)	92,000	70,000
May 13 (a)	96,000	69,000
Calendar year	2,493,000	2,989,000

(a) Subject to revision. (b) Revised from last report.

(May 8-13) indicate 4,421,000 tons of bituminous coal and 7,000 tons of anthracite. Up to the close of the sixth week the total output since the strike began was 23,826,000 tons of bituminous coal and 39,000 tons of anthracite, a grand total of 23,865,000 tons. It is significant to compare this figure with the output in the corresponding period of the 1919 strike. At that time the anthracite mines were working to capacity and the 11,816,000 tons which they produced, added to the 29,329,000 tons contributed by the bituminous mines which remained in operation, gave a total for the six weeks of 41,145,000 tons. Measured against the supply of newly mined coal in the earlier strike, the present strike is thus some 17,000,000 tons behind.

"During last week (May 15-20), the seventh week of the strike, production has so far not equalled that of the sixth week. A temporary decrease on Tuesday was followed by an increase on Wednesday, but on no day this week have loadings thus far equalled the high point of the week before:

	1st Week	2d Week	3d Week	4th Week	5th Week	6th Week	7th Week
Monday	11,445	10,772	7,898	12,131	11,598	13,118	13,399
Tuesday	11,019	10,658	10,041	12,377	12,160	13,266	12,726
Wednesday	11,437	10,961	11,088	12,622	12,861	13,445	13,421
Thursday	11,090	11,482	11,193	12,981	12,487	13,266	13,283
Friday	11,296	10,714	11,596	12,362	12,778	13,727	..
Saturday	8,888	8,501	10,194	11,295	11,265	11,454	..

"The record of production therefore suggests no marked change in the number of men on strike. No further increase is reported in shipments out of southeastern Kentucky and Tennessee, the only district where any considerable number of striking union miners have gone back to work. In Pennsylvania there is little change in the non-union districts affected by the strike, except for a very slight increase in shipments from the Connellsville coke region.

"Some districts are now producing at a maximum, but in others, particularly the Southern Appalachians and the fields of the Rocky Mountain states not affected by the strike, demand is not yet active enough to call out full-time production.

"Practically complete returns for all of the roads give the daily average number of coal loads unconsigned for the week ended May 13 at 10,753 cars of bituminous coal against a maximum of 30,730 in the week ended April 8. In five weeks' time the number of unbilled loads has thus been cut to one-third. It is now below the level of March 4 last, but still above normal."

All-rail movement to New England seems to have found a temporary level of about 700 cars per week. During the week ended May 13 there were 716 cars forwarded, only 13 cars in excess of the previous week. This tonnage is mainly contract fuel. The spot receipts have dwindled steadily since the inception of the strike and Tidewater coal is now being distributed over a wide area formerly held by Pennsylvania coals.

Lake dumpings during the week ended May 22 were 307,367 net tons—298,620 tons cargo and 8,747 vessel fuel—as compared with 261,579 tons during the preceding week. The movement for the season is 1,704,735 tons; in 1921 it was 3,640,008 and in 1920 the total was 1,174,628 tons to date. The coal now being dumped at lower ports is divided about equally between Head-of-the-Lakes destinations and for cross-lake shipment to Buffalo and other points.

The Northwest docks are still receiving inquiries from

How the Coal Fields Are Working

Percentage of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan 1 to Apr 1, 1922 Inclusive	Apr. 3 to May 6, 1922 Inclusive	Week Ended May 6
U. S. total	45.6	55.7	..	..
Non-union				
Alabama	63.5	64.6	71.0	72.1
Somerset County	55.5	74.9	65.2	32.0
Panhandle, W. Va	55.3	51.3	35.9	44.9
Westmoreland	54.9	58.8	66.6	58.5
Virginia	54.8	59.9	71.2	80.2
Harlan	53.3	54.8	44.6	57.0
Hazard	51.7	58.4	56.7	66.1
Pocahontas	49.8	60.0	72.3	80.5
Tug River	48.1	63.7	76.4	86.2
Logan	47.6	61.1	69.4	73.4
Cumberland-Piedmont	46.6	50.6	11.9	16.8
Winding Gulf	45.7	64.3	65.1	68.2
Kenova-Thacker	38.2	54.3	74.0	85.5
N. E. Kentucky	32.9	47.7	57.3	60.4
New River‡	24.3	37.9	8.6	10.8
Union				
Oklahoma	63.9	59.6	16.5	12.0
Iowa	57.4	78.4	0.0	0.0
Ohio, eastern	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	0.1	0.5
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	10.6	12.0
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	11.5	9.5
Fairmont	35.3	44.0	4.1	4.8
Western Kentucky	32.5	37.7	40.1	72.2
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	1.3	2.2
Ohio, southern	22.9	24.3	0.0	0.0

*Rail and river mines combined.
† Rail mines
‡ Union in 1921, non-union in 1922.

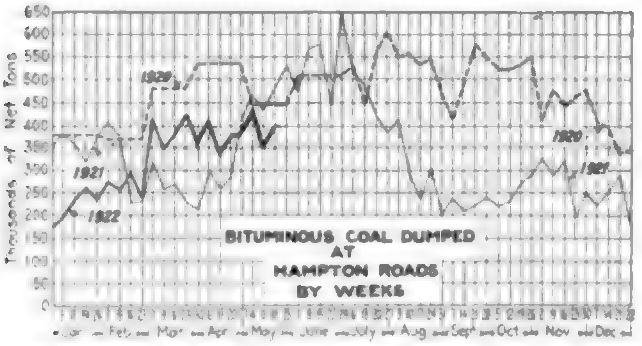
Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Apr 24, 1922	May 8, 1922	May 15, 1922	May 22, 1922†
Smokeless lump	Columbus	$2.85	$2.85	$2.85	**$3.50@$3.75**
Smokeless mine run	Columbus	2.00	2.40	2.90	**3.00@3.00**
Smokeless screenings	Columbus	1.55	2.20	2.90	**3.00@3.50**
Smokeless lump	Chicago	2.30	2.90	2.90	*2.50@3.00*
Smokeless mine run	Chicago	1.80	2.25	2.70	**2.50@3.00**
Smokeless lump	Cincinnati	2.65	2.90	3.25	**3.25@3.75**
Smokeless mine run	Cincinnati	2.00	2.60	2.90	**3.00@3.00**
Smokeless screenings	Cincinnati	1.90	2.40	2.75	**2.75@3.50**
*Smokeless mine run	Boston	4.80	5.65	6.75	**7.25@7.50**
Clearfield mine run	Boston	2.70	3.15	3.25	**3.50@4.00**
Cambria mine run	Boston	3.25	3.50	3.75	**4.00@4.50**
Somerset mine run	Boston	2.70	3.40	3.50	**3.75@4.50**
Pool 1 (Navy Standard)	New York	3.65	3.75		
Pool 1 (Navy Standard)	Philadelphia	3.45	3.75	3.95	**4.50@5.00**
Pool 1 (Navy Standard)	Baltimore	3.75	3.90	4.00	
Pool 9 (Super. Low Vol.)	New York	3.25	3.50	4.00	
Pool 9 (Super. Low Vol.)	Philadelphia	3.05	3.40	3.75	**4.25@5.00**
Pool 9 (Super. Low Vol.)	Baltimore	3.25	3.40	4.00	**4.50@5.00**
Pool 10 (H. Gr. Low Vol.)	New York	3.00	3.25	3.75	**4.75@5.00**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.90	3.20	3.60	**4.50@5.00**
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.95	3.25	3.75	**4.50@5.00**
Pool 11 (Low Vol.)	New York	2.75	3.00	3.65	**4.50@4.75**
Pool 11 (Low Vol.)	Philadelphia	2.70	2.85		
Pool 11 (Low Vol)	Baltimore	2.85	3.20	3.50	**4.50@5.00**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	2.50	2.70		
Pool 54-64 (Gas and St.)	Philadelphia		2.65		**3.00@3.75**
Pool 54-64 (Gas and St.)	Baltimore		3.00		**3.75@4.75**
Kanawha lump	Columbus	2.45	3.15	3.15	**3.40@3.75**
Kanawha mine run	Columbus	2.15	2.65	3.00	**3.00@3.50**
Kanawha screenings	Columbus	1.70	2.20	2.95	**3.00@3.15**
W. Va. Splint lump	Cincinnati	2.65	2.50	[illegible]	**3.25@3.50**
W. Va. Gas lump	Cincinnati	2.40	2.90	3.00	**3.50@3.75**
W. Va. mine run	Cincinnati	1.95	2.70	3.00	**3.25@3.50**
W. Va. screenings	Cincinnati	1.90	[illegible]	2.90	**3.00@3.50**
Hocking lump	Columbus	2.65	3.15	3.15	**3.75@4.00**
Hocking mine run	Columbus	2.15	2.90	2.90	**3.50@3.75**
Hocking screenings	Columbus	1.75	2.25	2.85	**3.25@3.75**
Pitts. No. 8 lump	Cleveland	3.40	3.25	3.25	**3.75@4.00**
Pitts. No. 8 mine run	Cleveland	$2.55	$3.00	$3.25	**$3.75@$4.00**
Pitts. No. 8 screenings	Cleveland	2.55	3.00	3.25	**3.75@4.00**
Midwest					
Franklin, Ill. lump	Chicago	3.45	3.45	3.95	
Franklin, Ill. mine run	Chicago	2.75	3.00	4.15	
Franklin, Ill. screenings	Chicago	2.75	3.00	4.15	
Central, Ill. lump	Chicago	2.65	2.75		
Central, Ill. mine run	Chicago	2.65	2.75		
Central, Ill. screenings	Chicago	1.85	2.00		
Ind. 4th Vein lump	Chicago	3.15	3.15		
Ind. 4th Vein mine run	Chicago	2.50	2.50		
Ind. 4th Vein screenings	Chicago	2.25	2.25		
Ind. 5th Vein lump	Chicago	2.60	2.60		
Ind. 5th Vein mine run	Chicago	2.60	2.60		
Ind. 5th Vein screenings	Chicago	2.40	2.40		
West. Ky. lump	Louisville	2.20	2.90	3.15	**3.00@3.50**
West. Ky. mine run	Louisville	2.00	2.65	3.15	**3.00@3.50**
West. Ky. screenings	Louisville	2.25	2.65	3.15	**3.00@3.50**
West Ky. lump	Chicago				**3.00**
West Ky. mine run	Chicago				**3.00**
South and Southwest					
Big Seam lump	Birmingham	2.00	2.00	2.00	1.95@2.10
Big Seam mine run	Birmingham	1.70	1.70	1.70	1.50@1.90
Big Seam (washed)	Birmingham	1.85	2.15	1.95	*1.75@2.00*
S. E. Ky. lump	Chicago				**3.50@3.75**
S. E. Ky. mine run	Chicago				**3.50**
S. E. Ky. lump	Louisville	2.40	2.90	3.15	**3.75@4.00**
S. E. Ky. mine run	Louisville	2.40	2.80	3.00	**3.25@3.50**
S. E. Ky. screenings	Louisville	1.70	2.60	3.00	**3.25@3.50**
S. E. Ky. lump	Cincinnati	2.40	2.60	3.00	**3.25@3.75**
S. E. Ky. mine run	Cincinnati	2.00	2.60	3.00	**3.25@3.75**
S. E. Ky. screenings	Cincinnati	1.65	2.50	3.00	**3.00@3.50**
Kansas lump	Kansas City	4.25	4.25	4.25	4.00@4.50
Kansas mine run	Kansas City	4.00	4.15	4.15	4.00@4.30
Kansas screenings	Kansas City	2.50	2.65	2.65	2.50@2.75

*Gross tons, f.o.b. vessel, Hampton Roads
†Advances over previous week shown in heavy type, declines in *italics*
NOTE Smokeless prices now include New River and Pocahontas.

Lake Michigan points and are shipping to more distant points than have heretofore drawn on them. This unusual distribution has brought a larger volume of inquiries.

The Minnesota State Railroad and Warehouse Commission has had a representative at Duluth investigating the shipping of coal to out-of-territory points in general and to Lower Lake ports by boat in particular. The report made to the commission stated that docks at Duluth were not making unfair price concessions in order to ship this outside coal, and that the commission had no authority to interfere with the shipment of coal down the Lakes.



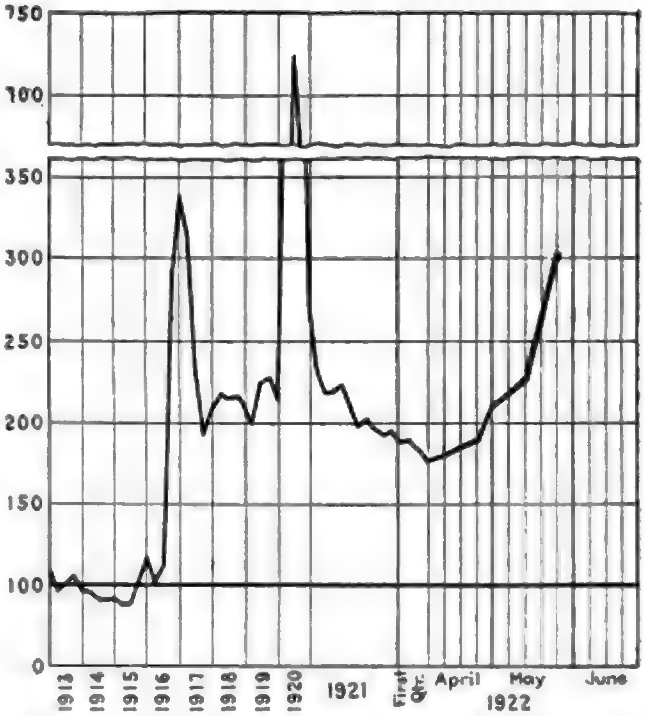
COKE

Beehive coke production was 96,000 net tons during the week ended May 13, the second consecutive week during which the output has increased since the strike began. The increase occurred chiefly in the Connellsville region.

The coke market remains inactive as to tonnage offering, however. Where an occasional blast furnace must have coke the price quoted is very high. Connellsville coal has dropped $1, due to the effect on buyers of the Washington price conference.

ANTHRACITE

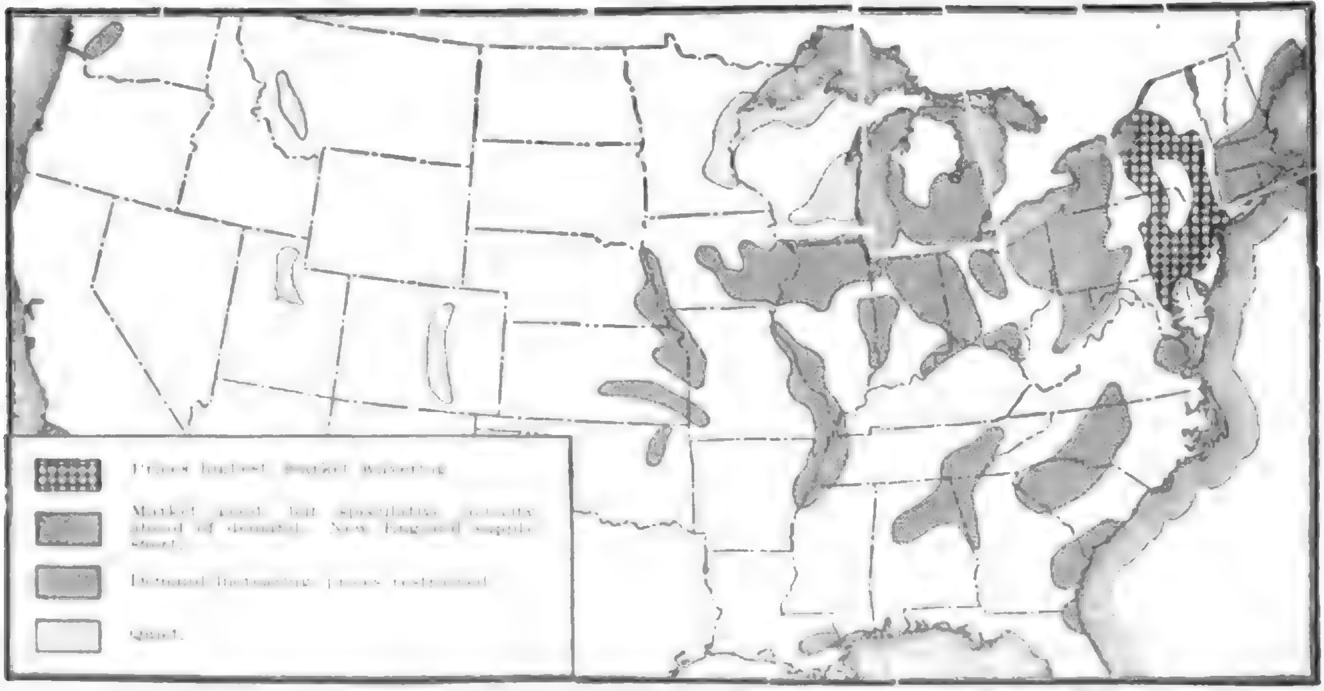
The situation is unchanged in the anthracite region. The total output during the week ended May 13 did not exceed 7,000 tons, being limited to steam sizes dredged from the rivers. Storage tonnage of domestic sizes has about been cleaned up with the exception of pea coal, which continues sluggish. Steam sizes are scarce except buckwheat No. 1, which is moving better because of the advancing bituminous prices.



Coal Age Index 302, Week of May 22, 1922. Average spot price for same period $3.67. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh District, Indiana and Illinois prices not included in figures for last week.)

Retail business is almost at the vanishing point. Some of the small orders now being placed are traceable to the strike, but the majority of the consumers feel that future price reductions are certain and are gambling on their ability to fill their needs after mining is resumed. Retail stocks will last well into the summer at the present rate of distribution.

Relative Activity of Markets for Bituminous Coal at End of Seventh Week of Strike


Market good, but speculative, mainly ahead of demand. New England supply short.
Quiet.

Foreign Market And Export News

British Production Declines; Export Market Prices Are Weaker

PRODUCTION of coal in Great Britain declined to 4,765,000 gross tons during the week ended May 6, according to a cable to *Coal Age*. The previous week's output, the high point of the year, was 5,160,000 tons. Prices showed a softening tendency during last week.

The trade in Northumberland and Durham is not quite so active. Inquiries are coming in but movements have been somewhat erratic and the general tendency is apparently in the direction of a general toning down in values. The only two orders worth reporting are from the Aarhuus gasworks for 90,000 tons of best Durham gas coal, and from the Amsterdam gasworks for 100,000 tons of Durham gas coals.

There is no change in the Scottish trade. While a few enquiries are coming from Italy and France, the home industrial demand is very poor.

Wales reports a slight decline in prices. This is no doubt due to the uncertainty of the home industries, on account of the engineering trades dispute, and also to the fact that supply is overtaking demand. The export branch of the business is not quite so uncertain.

Welsh miners' wages for May are still at the minimum of 28 per cent above the 1915 standard. March audits revealed that the industry could afford 16.76 above the standard, so that to make the wages up to the minimum the owners must sacrifice a further £171,371. Up to the end of March they have given up £1,309,000 in five months.

Business continues to be favorable in the north of England. The Swedish Marine has taken 7,500 tons of steam coals at 31s. 3d. and 31s. 5d. Inquiries include 2,000 tons of special gas coals for the Aalborg gas works and 15,000 tons of steam coals for the Latvian Railways for shipment during June and July. The Danish State Railways are in the market for 100,000 tons best screened steam coal for shipment from May to December. Other inquiries in the North of England aggregate 100,000 tons of unscreened coking coals.

British March Exports Are Heavy

Exports of coal from the United Kingdom during March showed an increase of 1,200,000 tons, or nearly 30 per cent, over the February exports, according to *Commerce Reports*. Coal supplied to ships engaged in foreign trade also increased about 10 per cent.

The principal increases appear in the coal shipped to Italy, the Netherlands, and Germany. Belgium, the Scandinavian countries, and others also received increased amounts, while shipments to Russia, Chile, and Brazil declined.

UNITED KINGDOM EXPORTS OF COAL

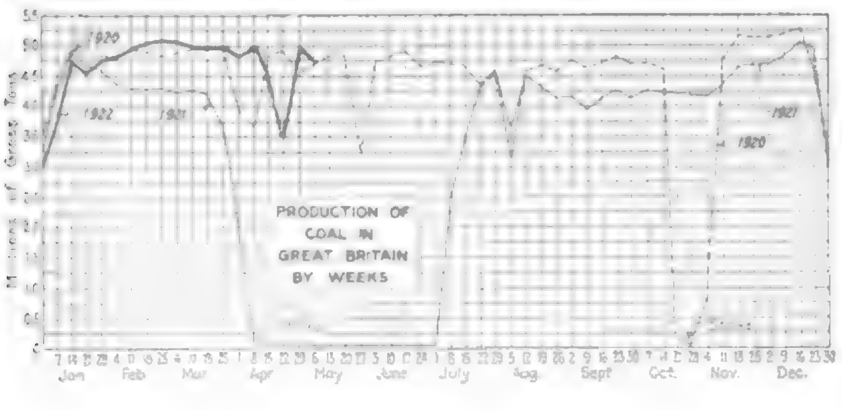
Exports to	March, 1921	February, 1922	March, 1922
	Gross Tons		
Russia	......	17,546	8,502
Sweden	78,853	122,272	149,306
Norway	44,587	144,252	179,455
Denmark	148,599	165,598	211,578
Germany	67,732	359,889	467,718
Netherlands	113,713	336,725	597,248
Belgium	10,938	239,027	310,187
France	437,659	1,206,442	1,237,815
Spain	127,642	152,429	151,874
Italy	332,480	319,349	681,110
Greece	37,083	16,061	50,293
Chile	179	9,526	2,891
Brazil	6,097	72,318	64,381
Uruguay	31,972	35,378	31,653
Argentina	98,520	128,252	132,065
Egypt	66,857	134,036	159,380
Other countries	365,167	555,234	765,779
Total	1,968,078	4,014,334	5,201,235
Bunkers	1,056,005	1,409,007	1,543,519

Coal Paragraphs from Foreign Lands

GERMANY—Production in the Ruhr region during the week ended May 6 was 1,561,000 metric tons, according to a cable to *Coal Age*. The preceding week's output was 1,911,000 tons.

ITALY—The price of Cardiff steam first is quoted on the Genoa market at 39s. 9d., according to a cable to *Coal Age*. Last week's price was 41s. 3d.

SPAIN—Production of coal during 1921 was 4,718,838 metric tons, as compared with 4,928,989 in 1920. The bulk of the coal was produced in the Province of Oviedo. Lignite output was 408,684 in 1921 as against 552,425 tons the previous year. Anthracite output totaled 292,591 tons in 1921 as compared with 491,715 tons in 1920. The output in the Province of Palencia showed a large increase, while both Cordova and Leon output fell. There were 969,393 tons of coal imported during the year, as compared with 332,362 tons in 1920; coke imports were 110,645 tons against 37,133 tons.



Trade Booms at Hampton Roads

Increased activity at all piers featured the week at Hampton Roads, while all prices took a leap upward, high-volatile reaching the highest point for eighteen months. The demand for coal was good throughout the week, with prospects considered good for a continuation of brisk trade.

Export business fell off, but movements to New York and New England were on the upgrade, with bunkers holding their own. Supplies at port were slightly depleted, but sufficient for current demands. Only in the high-volatile coal at Newport News was there any serious depletion of stock.

Hampton Roads Pier Situation

	—Week Ended— May 11	May 18
N. & W. Piers, Lamberts Point		
Cars on hand	1,367	1,506
Tons on hand	73,444	81,382
Tons dumped	166,089	177,348
Tonnage waiting	10,000	20,000
Virginian Ry. Piers, Sewalls Point		
Cars on hand	1,084	929
Tons on hand	54,200	46,450
Tons dumped	90,558	118,764
Tonnage waiting	31,650	20,442
C. & O. Piers, Newport News		
Cars on hand	602	793
Tons on hand	30,100	39,650
Tons dumped	50,882	61,706
Tonnage waiting	8,300	9,200

Export Clearances, Week Ended, May 18, 1922.

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Am. Schr. James E. Newson, for Fort de France	1,035
For Brazil:	
Am. S.S. Robin Hood, for Reo de Janeiro	8,437
For Cuba:	
Nor. S.S. H. K. Waage, for Havana	3,015
For Italy:	
Br. S.S. Vestalia, for Portoferrajo	8,085

Pier and Bunker Prices, Gross Tons

PIERS

	May 13	May 20†
Pool 9, New York	$8.00@$8.50	$8.00@$8.50
Pool 10, New York	8.00@8.25	8.00
Pool 9, Philadelphia	6.55@7.00	**7.25@7.50**
Pool 10, Philadelphia	6.40@6.75	**6.95@7.45**
Pool 71, Philadelphia	6.90@7.30	**7.45@7.70**
Pool 1, Hamp Rds	6.50@7.00	**7.00@7.25**
Pools 5-6-7 Hamp. Rds	6.50@7.00	**7.00@7.25**
Pool 2, Hamp. Rds.	6.00@6.50	**6.75@7.00**

BUNKERS

	May 13	May 20†
Pool 9, New York	$7.50@$7.75	**$8.20@$8.50**
Pool 10, New York	7.25@7.50	**8.25**
Pool 9, Philadelphia	6.85@7.30	**7.40@7.65**
Pool 10, Philadelphia	6.80@7.00	**7.25@7.55**
Pool 1, Hamp Rds	7.00@7.25	**7.25**
Pool 2, Hamp Rds	6.40@7.00	**7.00**
Welsh, Gibraltar	43s. f.o.b.	43s. f.o.b.
Welsh, Rio de Janeiro	55s. f.o.b.	**57s. 6d. f.o.b.**
Welsh, Lisbon	43s. f.o.b.	43s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	43s. t.i.b.	43s. t.i.b.
Welsh, Messina	41s. f.o.b.	41s. f.o.b.
Welsh, Algiers	41s. f.o.b.	41s. f.o.b.
Welsh, Pernambuco	62s. 6d. f.o.b.	**65s. f.o.b.**
Welsh, Bahia	62s. 6d. f.o.b.	**65s. f.o.b.**
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Malta	44s. 6d. f.o.b.	44s. 6d. f.o.b.
Welsh, Las Palmas	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Port Said	46s. 6d. f.o.b.	**51s. 6d. f.o.b.**
Alexandria	44s.	55s.
Capetown	35s. 3d.	35s. 3d.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	May 13	May 20†
Admiralty, Large	28s. 6d. @ 29s.	28s. 6d. @ 29s. 9d.
Steam, Smalls	19s. @ 20s.	19s. @ 20s.
Newcastle:		
Best Steams	23s. 6d. @ 24s.	25s.
Best Gas	23s. @ 24s.	23s. @ 24s.
Best Bunkers	22s. 6d.	22s. 6d.

† Advances over previous week shown in heavy type; declines in italics.

Chicago and Midwest

Coal Industry in West Tries to Steady Market

New Effort to Keep Prices Reasonable And Distribution Even Is Based On Operators' Pledges — Western Kentucky Prices First to Weaken.

A NEW and determined effort to end the skyrocket prices in the Midwest region, if not for the whole country, is developing around the recently organized railroad buying pool which is now getting into its stride. The better element in the Western coal industry is doing its level best to make the industry handle its own present problems in so creditable a way that the Government will have no occasion to step into the coal struggle now going on. The plan, as it is now beginning to work out, not only will provide enough coal for the railroads all summer long at a reasonable price, but will care for public utilities and other essential coal consumers while planting a heavy heel on the sort of speculation which blows the lid off the price pot.

The railroads' new fuel committee at Chicago will supervise the buying of coal not only for all lines west of Ohio but will take care of other big consumers, unless some hitch in the plan appears. This centralizing of buying is expected to be extended into the East with sufficient inclusiveness to have a decided effect upon the whole market. By securing fair price agreements with coal producers and by keeping a large share of the country's buying down to that level, it is confidently hoped that for once the country will not suffer at the hands of speculators. In the Chicago market, at least, a certain restraint upon speculation is exerted by a daily check upon the number of cars of coal in the yards on open consignment and the publication of that total. This daily information, when watched by buyers, may prevent a good deal of panickiness.

Thus far the plan has worked with good effect in the Midwest. Nobody can look into the future, but, filled though the plan is with possibilities for failure, and balky as some railroads are about taking part, yet interested observers are convinced it is going to have a wholesome effect on the coal industry generally at a time when such influences are to be desired.

The Kentucky fields continue to be filled with buyers and operators there are talking about $5 coal by the middle of June in spite of the solemn prophecy from Chicago that reckless bidding is about over and next week will see a slight deflation of prices and a general steadying of the market. Domestic and country trade has gone for the summer, it appears. Industrial demand in certain quarters is improving steadily.

LOUISVILLE

Reports from various sections of the fields show that many mines that have been down have resumed operations. Some of the wagon mines are now getting started, it is said. Loading records are being shattered, and tonnage is far above any previous peak level of production. Mines are not having to sell coal today, it being more a question of accepting the best bids. With the jobbers of Louisville it is a question of finding enough coal to supply orders.

Jobbers and operators are getting plenty of inquiries. There are numerous buyers in the fields. Price levels are advancing, and expected to go still higher as reserve stocks of industries and utilities are beginning to feel the long strike strain.

ST. LOUIS

Domestic buying is at a standstill and retail steam demand is easy. A hasty survey of the storage yards in St. Louis shows that there is between 60,000 and 80,000 tons of screened coal in storage. Screenings may total over 10,000 tons. Owners are beginning to unload this storage as carload steam at about $5 on cars at St. Louis for domestic and $4@$4.50 for steam. Indications are that the domestic user will not buy this coal so it releases it for steam and incidentally is the weapon used against western Kentucky high-priced coal, which temporarily is out of this market at its present price of $3.50 and up. Some of this coal is coming in at the prices of a month ago, when it was bought. But large tonnage purchased a month ago at low prices has not been shipped. This has caused some trouble.

CHICAGO

By all odds the biggest thing in the Chicago market during the past week has been the new effort to hold prices in line by agreement in the trade and by other methods. The results of this effort have been obvious in several quarters. In the first place a good deal of western Kentucky and Eastern coal, brought into this market evidently for speculation, got into trouble during the last three days of the week and were unloaded without profit. On Friday night a total of 309 cars were in a similar fix and the loose flow in this direction, which had set in for the second time this month, appeared to be checked, for the market is evidently not going to absorb coal at a price much if any above $3.

This new local influence plus the fact that the trade the country over, seems to be awaiting developments of the recent Hoover fair price conference with non-union operators is expected to have a decided settling effect upon the trade in this section during the week which began the 22d. The tendency of western Kentucky to attain $4-heights by the 22d seemed, at the end of last week, to have vanished. A good deal of coal from that field sold here at $3.60@$3.70 all week long and a little touched $3.80, but a sharp slump the first of this week presaged an early end of the purely "spec" market here.

Very little coal other than that from various Kentucky fields sold here during the past week. A trickle of smokeless, mostly for regular customers, has been coming in continually, but the first of this week saw a 75c. decline in the spot smokeless market.

SOUTHERN ILLINOIS

No disturbance has so far marked the suspension period in the southern Illinois fields. Several unmarried mine workers leave the mining sections daily for industrial centers. In Franklin County there is some loading of small screenings that have been on the ground for many months. Some railroad coal is still held at mines but the commercial coal is gone. The last prices quoted were $4@$4.25 for domestic sizes and up to $3.50 for screenings.

There is still a little commercial coal in cars in the Standard field and a few cars at Mt. Olive. This is for the most part being held for speculation. There are several thousand tons of steam and screened coal on the ground at mines in this district that are being held at $4.50.

A few thousand tons of Springfield district steam sold in St. Louis recently at a price understood to be better than $4 on cars at mine, loaded from storage.

INDIANAPOLIS

The market for coal throughout the Indianapolis region is reported to be on the mend. A slow improvement in industrial conditions is having its effect. Buying is not reckless, however, in spite of the tendency to grow flighty over the entrance of the railroads into the market for large tonnages from western Kentucky, a field which has been sending coal here steadily.

Coal has become so plentiful on the Pennsylvania that at Ft. Wayne, it has ceased loading coal from the huge pile in the yards there. For some time the company has been drawing on its reserves to tide over any possible shortage. Recently, officials say, a sufficient supply of coal has been available without using reserves.

WESTERN KENTUCKY

Demand for coal is steadily increasing as industrial and rail stocks are reduced. Buyers are flocking into the fields, including industrial consumers, brokers and operators from Indiana and Illinois who are endeavoring to secure coal to supply their regular customers.

It was reported from Madisonville, that over fifty coal buyers were there in search of coal at one time.

Prices are advancing steadily, the level of $3.50@$3.75 being quoted this week by the operators, who are only booking short-run business, and who are indifferent to the take-it-or-leave-it point. They can always load it out and wait for business and be fairly certain of getting a better price. The Chicago market, which has been purely speculative, slumped sharply, however, at the beginning of this week.

Anthracite

Steam Market More Active As Bituminous Prices Stiffen

Householders Relying on Price Drop, Play Waiting Game—Retailers Still Have Good Domestic Stocks—Storage Tonnage Except Pea, Cleaned Up—Lake Trade Dormant.

CONSUMER buying has almost disappeared. Some of the small orders still being placed are traceable to the strike but the majority of the householders feel that price reductions are sure to come and are gambling on their ability to fill their needs later on. Retailers still have stocks of all domestic sizes on hand, which may last well into the summer. Storage tonnage has about been cleaned up, with the exception of pea coal and this is not moving well.

Stiffer bituminous prices have brought about a more active steam market, although buckwheat is the only size available.

PHILADELPHIA

Retail trade has almost reached the vanishing point, and with some of the smaller yards the receipt of an order is almost an event. However, it is still believed that the larger proportion of buying that does develop is traceable to the strike, as we have had dealers report that people in very moderate circumstances have frequently of late ordered a ton or two to have something in store should the next coal burning season arrive without the miners at work.

The yards nearer the center of the city seem to have the most coal. Farther out toward the suburbs less coal is apparent. There is still an offering of nut from storage at $8.40 @$8.60, and there is also again a little storage egg coal, for which $9 has been asked recently. Pea is still very plentiful at $6.

With payment for coal shipments made from the mines in March due now, the shippers are exerting greater efforts to get the money in, and there are more reports of slow accounts than for years. There is no question that dealers' payments are held back by the slowness of their trade to meet their obligations.

Buckwheat moves somewhat better in the steam trade. Rice has been about cleaned up and some of the latest shipments went out at $2.75, an advance of 25c.

NEW YORK

There is little activity in the wholesale market and the same applies with equal force to the retail situation. Stocks have dwindled rapidly and the market is practically clear of domestic sizes, except for pea coal.

With the present conditions remaining unchanged it is possible that some retail dealers will have sufficient coal to carry them until June 1. Some retail concerns are circularizing their customers advising them to place orders for next winter's coal, to be delivered when work is resumed in the mines, current prices at time of delivery to prevail.

Retail dealers as a rule are able to fill orders for any of the larger sizes but their supply of stove had been heavily drawn upon and will soon disappear. Pea coal which is now in storage continues to slumber. Nobody seems to want it and the demand is quiet.

The steam coals are getting scarcer. Demand for buckwheat suddenly picked up due it is felt, to the advanced quotations for bituminous coals. Rice and barley are harder to obtain. Quotations for buckwheat ranged $3.35 @$3.75; rice, $2.50@$3 and barley $2 @$2.25.

BOSTON

The market for domestic sizes is now at about a standstill. One or two large producers have chestnut still in storage and one company is understood to have a small tonnage of egg, but aside from these two temporary sources of supply there is practically nothing available above the size of pea. Independents are still circularizing this section, but the number of cars now coming forward is very small.

Retail shows little improvement except in a few communities where there is developing a mild demand for season's supply. Should this spread it would not take long to move the reserve now in dealers' hands.

Certain of the originating companies are meeting with fair success in moving stock pea. They anticipate an upward demand for this size before June has progressed very far.

BALTIMORE

Except for the fact that there is practically no demand the present situation of reserves would be serious. Only a few of the dealers now have as much as 500 tons in hand, some have no coal at all, and the average for about thirty of the largest dealers is not over 150 tons. Baltimore burns normally as spread over the year about 60,000 tons per month, and the probabilities are that the present reserve at all yards is not over 10,000 tons.

BUFFALO

The movement is at its smallest. With scarcely any demand, there is next to no coal on hand. Consumers as a rule have coal left over from the winter and are not disturbed over the strike. If it ends soon enough to meet the winter's needs that is all that people think about.

There is a little chestnut to be had and the steam sizes are long enough. Shippers wonder that users of the regular fuel sizes do not put in the small coal in moderate quantity, for with a little furnace coal they can be made to answer all ordinary purposes and at prices $4 or so off.

Independent operators are still selling a little coal, getting a small premium for it, but they will have none soon, as they were usually not able to put as much into store as the line companies did. Jobbers find only a small demand for this coal.

Coke

CONNELLSVILLE

Furnace coke is quoted $6.25@$6.50, against $6.50 flat a week ago. Offerings are very light, while there is only occasional demand from a blast furnace. Sales are small, and chiefly to miscellaneous consumers. Foundry coke remains quotable at $6.75, with offerings approximately equal to demand. In the region as a whole coke production is at about 40 per cent of the March rate, but coal production shows a relatively greater decline.

The policy of the Connellsville operators is unchanged, to let the strikes run as long as they will. As to being a part of the general strike, which the strikers think they are, they occupy a very poor strategic position, since even if the union operators were disposed to negotiate there would be no means of inducing Connellsville operators to participate, while no demands upon the Connellsville operators have been made by the strikers.

The *Courier* reports production during the week ended May 13, at 40,400 tons by the furnace ovens, and 13,750 tons by the merchant ovens, a total of 54,150 tons, an increase of 1,950 tons.

UNIONTOWN

The Connellsville strike is now waning. Production has not only resumed at many of the mines first affected, but a great many wagon mines, operated only in times of market activity, have started up and many miners ordinarily employed at the larger operations have secured employment at those mines. The union organizers have disappeared from the public view. They may yet be in the region but have refrained from holding public meetings for a week.

The Monongahela River district, which for six weeks was one of the organizers' strongholds, has finally commenced to crack and several larger mines are now operating, with indications that several other plants could be operating if the owners so desired.

The coal market is an up and down affair. It is now $3.25@$3.50, having softened $1 because of the effect of the Washington conference on buyers. All command the same price with but very little byproduct in demand. The coke market is inactive as to tonnage but strong as to price.

BUFFALO

The coking companies in Pennsylvania are so short that the local byproduct ovens are obliged to supply the coke here. The coal that comes in by Lake from West Virginia is very suitable for making coke. Quotations remain at $7 for best 72-hr. Connellsville foundry, $6 for 48-hr. furnace and $4.50 for stock.

North Atlantic

Buyers Are More Cautious; Bidding Less in Evidence

Some Large Buyers Off Market After Washington Conference with Non-Union Producers — Prices Barely Firm—Southern Coal Flowing In—Smaller Consumers About to Appear.

THE Washington conference with non-union producers has caused a more cautious buying policy. There is less bidding for the tonnage that is offering and some large buyers have withdrawn from the market. Quotations are barely firm but there are fewer takers. As the accumulation of cars at the New York piers has grown there is a tendency to shop around before placing an order.

Southern coals continue to flow in heavily. At Philadelphia there are many inquiries for freight rates from distant and unfamiliar points, indicating a growing urgency to buy. So far the larger buyers constitute most of the market activity, but signs are not lacking that the smaller consumers are about to enter the market.

CENTRAL PENNSYLVANIA

Production is on the increase. The output for the week ended May 13, was 2,831 cars, as compared with 2,437 the week previous. Mines on the South Fork branch more than doubled their output.

The situation over the district, is quiet, only small and widely scattered disturbances being reported. Both sides are confident of winning out.

Miners in some sections of the field, largely in northern Cambria County and in Somerset, are growing restless as a result of the enforced idleness. A meeting was held last week during which the miners demanded to know what has been done with the money they have been paying into the union and why they are receiving no strike benefits. The result is that the U.M.W. leaders are holding very few meetings.

NEW YORK

Whether as a result of the Washington conference or because of the lack of demand, the market was easier toward the end of last week. Quotations seemed to be firm, although it was said that many sales had been made at lower figures.

There was about 40 per cent more coal at the local piers on May 19 than on the corresponding day of the previous week, much of this being on consignment. The habit of some buyers bidding against each other in order to obtain coal has been heard of but the instances are scarce.

Southern coals are coming forward in good tonnages, most of it being under contract. Some offers of English Admiralty grade coals have been received here on a basis of from $6.85@$7 c.i.f. New York. It is not thought at this time that any of it will be brought to this port.

Those consumers who must have coal are not particular as to the quality, but they are painstaking as to the price and will not pay any more than they must without canvassing the offices thoroughly. Reserve piles are being slowly eaten into and it is only a question of a short time before large consumers will be looking for coal.

It was reported that a small lot of Pool 14 at Port Reading had been offered at a price of $8 f.o.b.

BALTIMORE

Prices reached a peak on May 18, and then dropped a bit. During the high-water mark even moderate grades were readily commanding $4.75@$5, and bunker coals were selling around $8 gross. At this writing coal of any kind is worth $4@$4.50 f.o.b. mines. There is practically no high-grade steam coal on the market.

The larger industries are still fairly well supplied, although some are now beginning to buy more extensively to prevent depreciation. The railroads and large public service corporations state that they have enough to carry them over for a considerable period.

The halt to the upward price movement was apparently due to the psychological effect of the conference in Washington called in an effort to prevent a runaway price market for soft coal. As stocks are low and demand is on the increase the best posted coal men here would not be surprised if the coming week would again see price conditions on the jump. It must be remembered that the conference in Washington was attended by only some fifteen operators, who could not control the greater part of the coal field. It is understood here that a meeting has been called for the National Coal Association membership and that it will take at least two weeks to formulate a plan to carry back to Mr. Hoover for approval.

PHILADELPHIA

It would seem that the continued improvement in the iron trade has so stiffened the demand that large consumers among the utilities are coming out and trying to get a larger portion of the production. It did not take long for $5 coal to be reached, most undesirable as it is from all standpoints.

There is no question that production has increased, but unfortunately it is far below the proportion of increased consumption and for this reason reserves are fast being reduced. So far the smaller consumer continues to hold aloof of the market, but it is certainly only a matter of a very few weeks before he is smoked out into the open and will have to bid for the available fuel along with the other consumers. More southern coal is reaching the city, not only by boat, but by rail, and with a freight rate around $5. As showing the trend, the rate departments of the railroads are handling a large number of inquiries for rates from distant points which rarely, if ever, originated coal for this market.

A majority of the houses simply refuse to quote prices. They continue to advise consumers not to buy unless absolutely necessary, and in that case offer to procure coal at the best possible price, plus a reasonable brokerage.

FAIRMONT

Steady production gains are being made in the face of a strike. The increase is noticeable on the Charleston Division of the B. & O., the Monongah Division of the same road and on the Morgantown & Kingwood. There were 123 mines in operation during the week ended May 13. Mine run ranges around $4.

UPPER POTOMAC

Substantial gains are being made in the Upper Potomac, loadings now amounting to about 15,000 tons a day. Approximately half the mines in this district are now running. Prices are strong. Little change is to be observed in conditions in the Georges Creek region, where most of the mines are still in idleness.

South

BIRMINGHAM

Alabama mines are gradually being benefited as a result of the strike, but the volume of business so far has been somewhat disappointing, and has not been sufficient to stimulate either production or the market to any great extent. Most of the coal bought has been for shipment through the Memphis gateway for use west of the river, for railroad fuel. Quotations in considerable number have been requested by industrial users in foreign territory, but no great amount of business has developed so far. There has been no noticeable increase in the demand from local territory.

Things are likewise dull as regards domestic fuel. Mines are having some trouble in placing the output under present restricted operation. Dealers are stocking rather slowly. Quotations are as follows:

	Mine Run	Domestic
Carbon Hill	$2.00@$2.25	$2.20@$2.45
Cahaba	1.85@ 2.25	2.95@ 3.45
Black Creek	2.00@ 2.40	2.75@ 2.95
Corona	1.80@ 2.00	2.45@ 2.70
Pratt	1.75@ 2.00	....

Production has been on a basis of about 275,000 tons per week for some time but indications are that the output will show some increase.

VIRGINIA

Production is being maintained at more than 80 per cent of capacity in the region as a whole. With the demand on the increase and prices climbing upward many of the smaller mines are resuming operation. Producers are marketing a large industrial tonnage in Eastern and Southern markets. There is little or no market for lump, however, except that which is being shipped on a contract basis.

Northwest

Upper Lake Ports Fret Over Outgo of Stocks

They Wonder Whether Their Safety Supplies Will Hold Out—Demand Light in Their Normal Territory—Cargoes Slow Coming In.

A QUICKENING in demand for coal has been felt during the past few days at the Upper Lake docks, indicating the effect of the strange tendency to ship coal down the Lakes instead of only Inland. This has set up a fretting among some Northwest interests for fear the dock stocks will not meet the Northwest's needs, but others say there is still plenty and this unloading may be a fine thing, for it will leave less high-priced coal on hand at the end of the strike when a price drop is anticipated. Business and industry in general throughout the region has not improved much. Upbound cargoes by Lake are few. Prices have not increased.

MINNEAPOLIS

Coal selling seems to be getting harder and harder, despite the support which the strike ought to give to the market. Dock run coal has been quoted as low as $5.25 f.o.b. dock and up to $5.50 but it has not resulted in any material gain in business. No amount of price cutting develops any business. It only makes trouble.

The general commercial situation seems to be slowly improving. There is no hope for anything more than a gradual return, and this means that the demand for fuel will be equally gradual. The feeling of buyers of coal generally is that there is bound to be a substantial reduction in prices, and they propose to wait. They may be disappointed althought on steam coal, prices have already gone down sharply. Retail orders for anthracite are being solicited here on old prices, guaranteed until September 1.

A shipment of pig iron from Sheffield, Ala., by water to Metropolis, Ill., destined for a stove foundry at Shakopee, Minn., saved $4 a ton over the rail rate. The through rate from Sheffield to Shakopee is $9.62. If the shipment could have been sent all the way to St. Paul or Minneapolis by barge, leaving only a 20-mile rail haul, the saving would have been considerably more. This is being used as an argument for the development of river transportation, and coal from the Illinois and Kentucky fields always enters into any serious consideration of it.

DULUTH

A most noticeable increase in inquiries has been remarked at Duluth-Superior docks within the last three days from both inside and outside this territory. Security from shortage here, which seemed assured by heavy stocks on hand when the strike started, is endangered, and it seems probable that a real rush of buying will take place within a week or two.

Reports from railroad companies show that for the last two or three days, 1,500 tons daily have gone out from Head-of-the-Lake docks to points outside of the territory. Probably the amount of coal shipped consumers within the territory is about the same.

The real propelling motive behind the quickening of trade is published reports of shipments of coal from this harbor to Lake Michigan ports. Five boats have already been chartered to carry coal to near-mine points, as was reported two weeks ago, and numerous inquiries have been received for more cargo shipments. It is commonly understood that the coal will go to Lake Michigan rather than Lake Erie ports.

Madison, Wis., usually outside Duluth territory, has been a heavy buyer in local markets. One public utility there is reported to have made sure of an adequate supply of coal.

Market in bituminous is stiffening perceptibly. The price is still $6.50 for lump and $6 for run of pile, but any shading has disappeared. It seems certain that prices will take a 50c. advance before a week has passed, which will make them at the level of a month ago.

MILWAUKEE

There is no demand at the present time, except from large users whose requirements have to be met regardless of market conditions. Domestic users are not buying and delivery systems are at a standstill. Dealers say there is a pent-up feeling of nervousness in the industrial world, and that things are liable to break loose in the coal market in the course of the next few weeks; however, there are no signs of anxiety just now.

Coal cargoes are coming in very slowly. The carferries are shunting considerable anthracite and soft coal over the rails to the interior country. Little coal is coming by rail because of the lack of demand. No changes have been made in the price list of either soft or hard coal since the drop of 50c. per ton noted in the last report.

Thus far this season only two cargoes of anthracite have reached port, and one of these consisted of only 700 tons. Soft coal cargoes number 26. Receipts of hard coal to date aggregate 8,000 tons, against 169,688 tons during the same period last year. Soft coal receipts total 189,909 tons, against 438,512 tons in 1921.

New England

Lively Competition at Roads Boosts New England Prices

Demand Slacker Since Washington Fair-Price Conference—With Stocks Heavy and Prices High, Consumers Await Developments—Tidewater Coal Further Invades All-Rail Territory.

COMPETITIVE buying continues at the Roads and this has increased prices at this end. The Washington fair-price negotiations have slackened the demand in New England. Stocks are heavy enough to enable consumers to await any developments that may possibly reduce the present high prices.

The current receipts are being reduced by the heavy Western and New York calls on Hampton Roads coals and rehandlers at this end are becoming extremely cautious about commitments. Pennsylvania fuels are little in evidence and only at very high prices. All-rail receipts have been dwindling since the strike began and Tidewater coal has been increasing the area of its distribution in this territory.

Buyers in the West and in New York continue their competitive buying at Hampton Roads. Sales at $7.35 per gross ton at the piers have been credibly reported. The trade here is much interested in negotiations at Washington looking to a "fair price" and the news thus far given out has for the moment slackened spot demand in this territory.

Other than for spot shipment the smokeless agencies are reluctant to name prices. There is beginning to be more or less delay in loading at the terminals and this is likely to increase as the market broadens along the line and in the West. Factors here look for still higher prices next week and as it looks at this writing that prospect will be realized. In any case, there is an apparent shortening of supply for this section. Those who have contracts find their shippers somewhat more rigid as to monthly quotas and some of those who rehandle for Inland distribution are much more guarded about commitments.

Non-union coal from the different Pennsylvania sections is now very little in evidence. Receipts all-rail are dwindling fast and here and there there is an inquiry for Tidewater coal to be shipped well into the narrow zone which because of high through-rates is restricted to the all-rail route.

For Inland distribution, there is a much quieter demand than was the case a fortnight ago. Buyers are marking time for the present and while quotations have been made as high as $8.25 on cars Boston there have really been very few sales at any high figure. Practically all of what tonnage is being absorbed in this way is drawn from rehandling plants rather than direct from cargoes.

Eastern Inland

Sellers Bull Coal Market, Taking All Traffic Will Bear

Hoover Parley Checks Connellsville Coal Prices—Speculative Coal Exceeds Current Demand—Diversified Demand Presages Active Market, Industrial Stocks Gradually Shrinking.

SPECULATIVE activity still outdistances current demand. Prices are being marked up almost daily. While the call is strengthening the fact that coal on consignment occasionally lingers on track and is sold under pressure to avoid demurrage is proof that sellers are taking all the traffic will bear and bulling the market. The Washington fair-price conference has reduced the prices for Connellsville coal.

There is a more diversified demand, which presages an active market, as industrial stocks are gradually being lowered. In Cleveland, however, the majority of industries buy power from the Cleveland Electric Illuminating Co., which is fully protected.

PITTSBURGH

There has been dynamiting at three wagon mines in the immediate Pittsburgh district, doing but little damage. The regular railroad river mines, being union, are all closed and there is no incident in this respect in connection with the strike.

Westmoreland gas and Connellsville steam were in the market, both at a general range of $4@$4 25. Offerings were perhaps increased a trifle, the advance in prices being attributed to heavier buying. Connellsville coal prices broke $1 early this week as a result of the government plan of inspection of coal orders by regional committees through voluntary action of some operators.

Large quantities of West Virginia coal are now coming into the Pittsburgh district. The steel industry has been buying coal very freely in non-union districts, in some cases making rather long-term contracts, but still has large stocks. The theory appears to be that when the strike does end coal will not be plentiful by any means. The balance of probability seems to be, however, that while the Connellsville strikes still look strong they will end some time before the union strike really comes to a head.

CLEVELAND

The undercurrent of sentiment among non-union operators is adverse to the price restraint plan outlined by Secretary Hoover. They are opposed to any act unless minimum prices are also provided which would insure against losses. In the meantime the coal market is tightening and stocks are getting precariously low. In connection with railroad demand it is significant that the roads have not found it necessary to confiscate any fuel as yet. In each case they are finding the owner of cars and arranging for the price before taking possession.

Steel mill operations are not being hampered, although the addition of new capacity is not being made as freely as might have been the case were coal supplies adequate. Industrial plants are beginning to feel the pinch in many cases. Considerable Kentucky and West Virginia coal is coming into Cleveland at prices around $3.75.

Up to date 1,500,000 tons of coal have been loaded at lower ports, half going up and half down the Lakes. Non-union coal is moving to the Lower Lakes quite satisfactorily.

Receipts of bituminous coal at Cleveland during the week ended May 13 amounted to 1,049 cars of which 817 cars were for industries and 232 cars for retail yards. This quantity is estimated to be about 70 per cent of normal requirements.

DETROIT

About the only indications of improvement are found in a stronger demand from the steel companies and an increase on the part of some railroads. Little inquiry for steam coal is coming from the industrial and manufacturing plants. Many of these establishments are credited with possession of substantial reserves, which are not being reduced very rapidly.

A number of steam users are avoiding purchases at this time in the expectation that by waiting they will be able to purchase at a lower cost. In refutation of this contention jobbers point out that stocks are now being reduced more rapidly than they are renewed and that there will be little or no reserve later in the year when the buyers begin flocking into the market.

Domestic demand has virtually ceased and the retail dealers are taking no additional supply. Instead, they are worrying over a possible loss on present stocks, if lower freight rates materialize.

Pocahontas in all sizes is quoted at about $3 at the mines. West Virginia and Kentucky lump is $3.50, mine run, $3.25, nut, pea and slack, $3.25.

EASTERN OHIO

During recent strike weeks the demand has principally been from large users such as railroads and steel plants for the purpose of making additions to their stock piles. In the past ten days the smaller consumers have been entering the market, not only for reserve fuel, but in some cases to supply current requirements.

Notwithstanding this increased activity the quantity available continues ample for all needs, evidenced by the fact that open consignments arriving in the larger industrial centers have not been readily absorbed, in some instances demurrage charges accruing.

Stripping mines continue to produce weekly a quantity estimated at between 30,000 and 40,000 tons although some interference with employees by union miners has been experienced.

Prices continue firm with a tendency to stiffen. Stripping coal is quoted as follows: Slack, nut-slack and mine run, $3.75@$4.25; these same grades from non-union mines in West Virginia and eastern Kentucky are $3.75@$3.85. There are very few, if any, cases of urgent need for coal throughout this section because the current supplies, coupled with reserve stocks, prove sufficient.

In the Lake trade additional tonnage has been lined up to move from Ohio ports, principally Toledo and Sandusky to Buffalo, but shipments to the Upper Lake docks are very light. Last week, the docks dumped 260,000 tons of cargo coal as compared with 755,000 tons during the same week last year.

COLUMBUS

Demand is increasing and with it comes higher prices. It is feared by some that the upward trend has only started and that extreme high levels will prevail for some time to come. Some of the larger producers and shippers have taken a firm stand against advanced prices in excess of $4 but it is doubtful if anything can be done to stop it if the consumers become insistent.

Reserve stocks are being reduced gradually and this is causing users to replenish them. Iron and steel concerns along the Ohio River section are buying practically all of the surplus coming out of West Virginia and Kentucky.

With rapidly advancing prices the wholesaler is doing a good business. Lake shippers are looking around for supplies. Contract prices have not been settled as yet.

BUFFALO

The price of coal goes up slowly, but steadily. Some jobbers still advise their customers not to buy, unless they are short, but many of them say they will pay more if they wait.

Locally the trade is about as unsatisfactory as possible. Jobbers say it is about useless to sell any coal, even after it is bought, for a great part of the operators will sell it again for a slight advance offered and then it may be impossible to find any more at the same price. This sort of bad faith will be remembered when the business becomes normal again. All sorts of prices are paid. A fair quotation is $4.25@$4.75 for Pittsburgh and No. 8 lump and $4@$4.25 for mine run and slack. Youghiogheny gas coal has disappeared.

Soft coal is coming in from Ohio ports, mainly Toledo, at an unprecedented rate, the amount for last week being 113,160 net tons. It is moved at a rate said to be less than $3 from the West Virginia mines to the Buffalo furnaces, and as it was bought before coal began to go up, is a good proposition.

NORTHERN PANHANDLE

Production is not far from normal and nearly all mines are in operation. The union has been extremely active in Marshall and Brooke counties and in one instance it has become necessary to obtain an injunction to prevent interference with the miners desiring to work. Steel manufacturers and railroads are in the market and much of the output is being utilized for railroad fuel.

Cincinnati Gateway

Hoover Warning Has Slight Tendency to Check Advance

Scramble Forces Price 25c. Above West's Offering Figure—Tidewater Demand Boosts Logan Prices—West Virginia Leads Kentucky Coal in Market — Smokeless Business Tremendous.

PRICE advances featured the coal market last week. Without enough coal to go around, a scramble for tonnage ensued which raised prices 25c. a ton over what the West was offering. The effect of Hoover's warning so far has been a slight diminution of buying orders early this week, which has had a checking tendency on the advancing prices.

Tidewater demand boosted the Logan prices last week. West Virginia led Kentucky coals on the market. Smokeless business has risen to a terrific volume and any available tonnage was quickly taken by the speculative element in the trade.

HIGH-VOLATILE FIELDS

KANAWHA

There are fully twice as many mines now in operation as at the time the strike became effective. Demand has reached a point where it is outstripping the supply, at least as to mine run and slack.

LOGAN AND THACKER

Because of a heavy call Logan mines have been forced to exert themselves to keep up with the heavy demand coming from steel interests, railroads and some of the utilities, coupled with a growing demand at the Lakes. Some large contracts are being placed but shipments are being made as a rule on a monthly basis, owing to changing prices. Little lump is being shipped as the demand is not heavy.

Thacker production is on a higher level than at any time in recent years, ranging from 145,000 to 150,000 tons a week. The steel people and the railroads are securing large tonnages. The demand in the West for Williamson coal is steadily increasing. The union is making no headway in shutting off production in this region, which is still under martial law.

NORTHEASTERN KENTUCKY

Although losses in Northeastern Kentucky are being sustained by reason of the strike, they are slight, not amounting to more than 7 per cent of full time. Production is between 60 and 70 per cent of capacity. Steel concerns have been and are heavy buyers but other industries are also represented in the market and as a result of the increased demand prices on mine run have risen strongly. Little other than mine run is being produced or shipped.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

Conditions are being rapidly restored to normal in the New River region, owing to the large number of men who are breaking away from the union and returning to work. Miners are not securing much aid from the union and hence are abandoning their strike despite the effort of leaders to hold them in line.

There is a heavy demand for smokeless both in Eastern and Western markets and at Tidewater with prices on a higher level.

The strike is no longer making any inroads on the Gulf output and with most of the mines operating production is averaging 27,000 tons a day. A large part of this is finding its way to Tidewater and to Inland East markets.

POCAHONTAS AND TUG RIVER

With large steel concerns seeking contracts and with the spot demand reaching larger proportions, it is possible for Pocahontas operators to produce a record-breaking output. Tidewater demand is reaching larger proportions and more coal is being exported to South America and the West Indies. Some fuel is also going into Philadelphia and New York markets, several large contracts covering delivery for a month or more having been closed.

All mines in the Tug River region are working and are speeding up production to take care of the increased demand, with the weekly outout averaging about 110,000 tons. The greater part of this output is flowing to Western markets, with the steel industry securing large tonnages. Other industries, however, are coming into the market, and that is stimulating the demand and hardening prices, especially on mine run. No strike losses are being sustained.

SOUTHEASTERN KENTUCKY

Car shortage is interfering very materially with production. Last week the mines worked only three days. Demand continues good with prices a little higher. Orders are becoming more scattered every day, indicating that stocks are getting low with other industries than steel companies.

The labor situation continues to improve. A lot of colored labor is coming in from Alabama, where an over supply of miners exists.

Persistent rumors of the sale to Ford interests of the Creech properties have been authoritatively denied.

CINCINNATI

The result of the excessive demand was a raise in price last week. There was a range of $3.50@$4 for any size of high-volatile, whether it were steam, byproduct or gas. The increasing tonnage from Kanawha and New River as well as Winding Gulf is said to have been snapped up for movement to the East.

Southeastern Kentucky kept trailing the market as it was set in West Virginia. The Elkhorn taking a lower freight rate to the steel mills points, could be expected to lead the van.

Smokeless business has risen to a terrific volume and any or all extra coal that can be mined is being snapped up. Eastern shipments again have the center of the stage. Most of this coal is being bought for shipment to Philadelphia, Boston and Baltimore. Larger companies are well sold up and the figures quoted are from speculators, jobbers and others who take advantage of every rise in the market. Hoover's warning had little effect here, most of the jobbers arguing that the law of supply and demand would have to work its own way out.

Retail business was practically unchanged from the figures quoted last week. One or two firms that were insecure in their supply of Pocahontas raised the price to $8 for lump but the others failed to follow suit. Deliveries are at the lowest ebb of any time this year.

West

SALT LAKE CITY

The strike has had no effect so far on industrial plants in Utah nor has it inconvenienced the domestic consumer. The plants are carrying large reserves and the small consumers are not buying.

New prices at the mines are as follows: Lump, $4.50; domestic lump, $4; stove, $3.75; nut, $3.50. Utah mine run, $3; slack, $1.25. This is a reduction of about 50c. a ton all round and was made possible by the lower wage scale. There is very little demand for slack. Lump is selling best. A further reduction may be made in the not distant future, as there is a possibility of lower freight rates.

KANSAS CITY

There is some improvement in the demand for both steam and domestic coal and the retail yards are beginning to clean up what they had in stock so that they will be able to start in the fall with a clean yard. Domestic grades held at the mines are moving out and are being used both for domestic and steam purposes so that in a very short time there will be very little local coal to offer.

There is no change in the labor controversy and neither side has made any move toward settling the strike. Prices have not advanced.

DENVER

A joint hearing between the Colorado State Public Utilities Commission and the Interstate Commerce Commission in session here three days regarding readjustment of freight rates in the Western states was concluded May 13. A similar hearing opened at Salt Lake City May 15. Meetings of this sort will be held by the Interstate Commerce Commission in most of the Western states.

No change in strike conditions throughout the state is noticeable. A lack of demand along with unrevised freight rates both contribute to a slow market. Deductions in coal prices either wholesale or retail are not likely, according to many operators.

News Items From Field and Trade

ALABAMA

The coal terminals constructed by the Government on Blakely Island, Mobile, to be used in connection with the Warrior barge line into the coal fields of Walker County, have been completed. These terminals were built at a cost of $400,000 and provide storage bins for export and bunker coal, equipment being provided for the rapid unloading of cars into the bins or directly into vessels. These improvements are expected to greatly increase the movement of Alabama coal through the port of Mobile.

The School of Mines of the College of Engineering of the University of Alabama offers five fellowships in mining and metallurgical research in co-operation with the U. S. Bureau of Mines. The fellowships are open to graduates of universities and engineering schools who have proper qualifications to undertake research investigation. The value of each fellowship is $540 per year of nine months, beginning Sept. 1. Fellowship holders will be required to register as graduate students and to become candidates for the degree of master of science unless an equivalent degree has previously been received. Applications are due not later than July 15 and should be addressed to H. D. Pallister, Professor of Mining Engineering, School of Mines, University of Alabama, University, Alabama.

COLORADO

The meeting of the **Colorado & New Mexico Coal Operators' Association,** in Denver, June 21, will be mainly to take up the freight rate problem in the two states, according to F. O. Sandstrom, secretary. Members attending the convention will be composed entirely of committees on transportation matters. Reduction in the prices of coal will depend on lower freight rates as present charges are considered out of line with other parts of the country.

CONNECTICUT

The Mill River Coal Co., New Haven, has filed a preliminary certificate of dissolution with the Secretary of the State of Connecticut. Claims against the company should be sent to William G. Lindopp, 152 Temple St., New Haven.

The Hartford Coal Co., Hartford, has recently added $190,000 to its capital stock, and filed a certificate with the State Secretary's office for an issue of 1,900 shares at $100 par value.

The Greenwich Coal Co., Inc., Greenwich, has filed papers of incorporation, to engage in the wholesale and retail coal and coke business, and will operate a yard in Greenwich. The capital stock of the concern is $50,000.

The Berkshire Mill Coal Co., Bridgeport, recently filed papers of incorporation to engage in the coal business. The company will have a capital stock of $100,000, and will commence business with $60,000. The incorporators are James A. Barri, Jonathan Grout and William B. Boardman, Bridgeport.

ILLINOIS

Elkville, a small town in Elk township of Jackson County is to have at least one more large mine if not two, in the near future. Drilling of test holes has been under operation for several months and it is announced that the company which has the tracts optioned is ready to begin sinking as soon as the present strike is ended. The name of the company has been withheld for some reasons not announced, but it is said the same concern operates several mines near Zeigler and other Franklin County coal mines. The site where the new mine is to be sunk, is five miles southeast of the large Kathleen Mine at Dowell, and eleven miles west of the Zeigler coal field.

W. S. Burris, general superintendent of the Jewel Coal & Mining Co.'s two mines at DuQuoin, was in Chicago recently on business at the offices of the Sterling-Midland Coal Co.

The prostrating of **Colonel Quin Morton**, the veteran Paint Creek operator and his removal to St. Lukes Hospital in Chicago was a shock to his many friends. Mr. Morton has been stricken with paralysis in his right leg. His company, the Wood-Morton Fuel Co., was recently consolidated with the Ft. Dearborn Coal Co., and later developments required the attention and time of Mr. Morton in Chicago, where he fell a victim to his over-activities.

Eugene V. McAuliffe, of St. Louis, president of the Union Colliery Co., of that city, was in Dowell recently.

C. A. Chapman, Inc., announces the twenty-second anniversary of Chapman Service as industrial and power engineers, also the opening of its new plant in the Madison Terminal Bldg., South Clinton St., Chicago.

The Old Salem Coal Mine Co., Petersburg, has been incorporated to mine coal. The incorporators are Perry Aitig, Walter S. Miller and John Jurgens, all of Petersburg.

Albert J. Nason, president of the **Illinois Coal & Coke Co.**, recently announced that his company had completed final plans for the sinking of the large mine in Elk Prairie township, near Mt. Vernon, Jefferson County. The company plans to construct a railroad from Mt. Vernon southwest near the site of the future mine and the name of the road will be the Jefferson & Southwestern R.R.

A. S. Austin, Sr., of Milwaukee, was in southern Illinois recently attending to business relative to the closing of the No. 2 mine of the Kanawha Fuel Co., at Du Quoin, of which company he is president. The mine has not been operated for over a year and practically all of the machinery, equipment, etc., around the plant has been sold.

INDIANA

The Howe Coulter Coal Co., of Chicago, has bought of the **Pike County Coal Co.**, of Indiana, all the coal property the company owns in Pike County, including the Atlas Mine and the Simplex Mine of Petersburg, together with 1,000 acres of coal land in that vicinity and 5,000 acres in Logan township, Pike County, where two 10,000-ton mines will be sunk as soon as the New York Central completes its trunk line that has been surveyed from Petersburg to Oatsville and to Francisco where the railroad company owns some mine property.

IOWA

The Kansas & Iowa Coal Co. has unearthed a strip mine along the right-of-way of the Wabash in Red Rock township. A small steam shovel has been at work for several days and one of much larger build and greater capacity has just been unloaded.

KENTUCKY

George J. Allen, formerly with the Dixie Fuel Co., at Nashville, Tenn., who for some time past has been operating the Allen Coal Co., a jobbing concern at Nashville, has come to Louisville, with the Dixie Fuel Co. branch.

With a capital of $30,000, the **McAuliffe Coal Co.**, Louisville, has been chartered by Lucile Harlan, Frank B. McAuliffe and Tim B. McAuliffe. The debt limit is $100,000.

The Kentucky & West Virginia Power Co., a $6,000,000 corporation supplying ninety per cent of the mining companies in Hazard, has purchased the W. C. Daniel light plant in Whitesburg and will at once extend the lines supplying several coal companies and possibly a tower or two. It is also planned to continue transmission lines on through the main Elkhorn coal fields.

The Elkhorn Block Coal Co., operating in the Upper Big Sandy territory has increased its capital from $25,000 to $125,000. This is to be expended on modern improvements which will enable it to double the production within the year.

MASSACHUSETTS

William T. Bennett, formerly associated with Alley & Page, Boston, has recently resigned his position and will enter the coal business at Boston.

Daniel P. Haskins, coal dealer, Chicopee, has let the contract for the construction of a $30,000 concrete and frame coal pocket and bunker at his coal yards.

Robert M. Grant of Boston, president of the New England Fuel & Transportation Co., returned to his headquarters at Boston recently after looking over the properties of the company in northern West Virginia.

NEW YORK

The Supreme Court, Brooklyn, has ordered four stockholders of the old **Columbus & Hocking Valley Coal & Iron Co.** to reply to the separate defenses entered by the reorganization committee and voting trustees of the concern whom they have sued for an accounting. The complaining stockholders allege that they with other stockholders, ten years ago, raised $700,000 to rehabilitate the company. It is charged that the defendants created subsidiary companies and elected as officers and directors men who were not stockholders in the Columbus & Hocking Valley company. These officers and directors are alleged to have squandered the money raised to rehabilitate the concern. The defendants deny the charges and state that the stockholders surrendered their certificates to the Hocking Valley Products Co. The reorganization committee accounted to the directors of the products company, they state, and the account was approved and the committee discharged.

OHIO

The Renner-Kline Coal Co., Bolivar, has been incorporated with a capital of $50,000 to mine coal in the Tuscarawas field. Incorporators are John M. Renner, Byron R. Barder, John C. Frank, Herbert Sheidler and Frank E. Ream.

The Big Mountain Coal Co., Columbus, has been chartered with a capital of $10,000 to sell coal. Incorporators are D. H. Armstrong, E. W. Lighthizer, E. H. Hanna, M. R. Wiltner and C. W. Culp.

The Trent-Mueller Fuel Co., Cincinnati, has been incorporated with an authorized capital of $30,000 to deal in coal, both at wholesale and retail. Incorporators are P. Trent, L. J. Mueller, William F. Hopkins, K. S. Morrison and Clifford Brown.

The Deaker Corporation offices have been removed to the Federal Oil & Gas Bldg., Akron.

The Baltimore & Ohio is planning to abandon its coal docks at Sandusky.

The Wallins Creek Coal Co., of Louisville, has opened a branch office in Cincinnati in the Dixie Terminal Bldg., with Alex Vowels, formerly with the Wyoming Coal Sales Co. in charge as sales manager and T. L. Bennett as assistant.

PENNSYLVANIA

There was little change in the strike situation in the Connellsville coke region during the past week, except that the Calumet plant of the **H. C. Frick Coke Co.**, in Westmoreland County, resumed operations in full. No additional plants were affected during the week nor were any gains made by the strikers at any mines in the region.

At the new Warwick Mine of the **Diamond Coal & Coke Co.**, near Masontown, a barn was completely demolished by dynamite thought to have been stolen from the magazine of the Frederickstown Coal & Coke Co.

Isaac J. Jenkins has been elected a vice-president of the Bertha Coal Co., Pittsburgh, succeeding **Captain Frank A. Gould**, who recently resigned to become general manager of the Lent Traffic Co., of Pittsburgh.

Appeals from the 1922 triennial assessment of coal holdings in Somerset County have been filed at Somerset by these coal companies: **Quemahoning Creek Coal Co., Listie Coal Co., Wilmore Coal Co., Quemahoning Coal Co., D. B. Zimmerman, Penn-mont Coal Co.,** and the **Somerset Coal Co.** The petitioners set forth that the assessments were not made by the assessors but by the county engineers. They all ask the county commissioners, sitting as a board of revision, to review the assessments and make such changes as are right and proper.

L. H. Conklin, president, and C. R. Bedford, secretary, of the **Von Storch Collieries Co.**, operating the Von Storch mine, in North Scranton, have disposed of their holdings in the concern to **Meeker & Co.**, a New York firm, which has for some time been acting as coal sales agent for the company. At the same time officials of both companies denied rumors to the effect that the **Temple Coal Co.**, of which F. H. Hemelright is president, was preparing to take over the Von Storch operation.

The Addison Coal Co., Johnstown, capital $100,000, has been incorporated. Treasurer, Morris Berney, Johnstown. Purpose, mining and dealing in coal and coke. Incorporators: Tobias J. Callett, Harry Silverstone and Morris Berney, Johnstown.

The Home Fire Fuel Co., Garrett, has been formed with $40,000 capital. Treasurer, C. D. Fritz, Garrett. Purpose, mining, operating, shipping and selling coal. Incorporators: M. J. Romesberg, Garrett; Isaac Weinstein, Meyersdale and William H. Fritz, Garrett.

Recent changes in the amounts of capital stock recorded at the State Department at Harrisburg are as follows: **Ninevah Coal Co.**, indebtedness increased $300,000; J. R. Eisaman, treasurer, Westmoreland County; **Monarch Fuel Co.**, indebtedness increased to $1,250,000; J. L. Kemmerer, treasurer, Allegheny County; **Consumers Fuel Co.**, debt limit increased to $200,000; John H. Jones, president, Allegheny County; **Stratford Coal Mining Co.**, capital, $5,000 to $98,000; William J. Schaffer, treasurer, Philadelphia.

The Pennsylvania Coal & Coke Corporation reports net income of $809,359 for 1921 after depreciation and amortization. Other items in the report are operating income of $5,908,670; total income, $6,037,778; balance after deductions, $989,168. The total production during the year amounted to 1,580,250 net tons.

VIRGINIA

The Clinchfield Coal Corporation, of Dante, has contracted with Roberts & Schaefer Co., for additional conveying machinery to be installed at the No. 8 tipple at Dante.

A new map of Virginia, showing the location of the power stations and transmission lines used in public service and the names of the public utility companies, has just been published by the United States Geological Survey, Department of the Interior.

WASHINGTON

The College of Mines of the University of Washington offers five fellowships for research in mining, metallurgy, and ceramics in co-operative work with the Bureau of Mines. The fellowships are open to graduates of universities and technical schools who are properly qualified to undertake research investigations. The value of each fellowship is $780 per year, beginning July 1. Fellowship holders are required to register as graduate students and to become candidates for the degree of master of science in mining engineering, or metallurgy, or ceramics, unless an equivalent degree has previously been earned. Applications are due not later than June 19, and should be addressed to the Dean, College of Mines, Seattle, Washington.

Notwithstanding that the large part of the coal mines of the country are closed down on strike, the market for coal is not sufficient to absorb the full production of the Pacific Coast Coal Co., and it has become necessary to reduce temporarily the production at Newcastle and Issaquah mines.

WEST VIRGINIA

The Baltimore & Ohio has started to make some extensive improvements in northern West Virginia. A three-mile stretch between Grafton and Clarksburg will be double-tracked, thus giving a freer movement to coal.

Fairmont people have launched the **Behler Coal Co.** with a capitalization of $50,000. Fairmont is to be the general headquarters. Active in effecting a preliminary organization of this company were: H. Shain, M. A. Joliff, S. J. Snyder, Seymore McIntire and Clay D. Amos, of Fairmont.

The circuit court of Kanawha County, which directed a verdict of $64,000 against the **Lake & Export Coal Corporation**, of Huntington, in the suit for damages of the **Fayette-Kanawha Coal Co.**, for $150,000 for breach of contract, has been reversed by the West Virginia Supreme Court and the case sent back for another trial. The output of two mines near Montgomery was involved. The plaintiff alleged that more coal could have been produced at these mines. The appeal court held that the actual capacity of the mines at the time the contract was negotiated was what should determine the capacity of the mines.

There were 25 fatalities in West Virginia mines in April, 16 of which were the result of falling roof, coal and slate. Mine car accidents were responsible for the death of three, motors for the death of three more, mining machines for the death of two and one miner was killed outside the mines by a railroad engine.

Authority has been granted for the sale of the Ruffner Mine in Logan County to William Roeggie, in the case of **A. D. Cronin against the Hinchman Creek Coal Co.** C. W. Freeman, special receiver, has completed the sale of the property previously owned by the Hinchman company and has been directed to pay certain debts including a bill of $3,449.84 due the sheriff of Logan County and the Auditor of West Virginia for taxes.

The Buffalo-Eagle Colliery Co., operating at Bracholm on Buffalo Creek in the Logan field has only recently completed the construction of a modern club house for the accommodation of its employees and the traveling public. This is a three-story structure, with walls of tile, the exterior being of stucco. In the basement there is a laundry. Shower baths and tubs have also been provided in the basement.

The Glogora Coal Co., of Huntington, has awarded to the Fairmont Mining Machinery Co., a contract for what is said to be the largest rope and button conveyor system in the world, to be used at the mine at Stickney, Raleigh County. The conveyor is to be 2,800 ft. long and is to be in two sections. Coal will be handled from the top of a hill and dumped into the second conveyor from which point the fuel will be carried to the tipple. Cost of the new equipment will be $60,000.

Having completed the installation of a siding and driven openings, the firm of **Talbott & McHale** has begun production at its new mine near Philippi. Edward McHale, who was one of the organizers, recently sold his interest to Brown Talbot and Donald Talbott. Offices of the company are at Philippi.

A case was argued before Judge W. S. Meredith of the Marion County Circuit Court early in May involving the ownership of coal lands in Mannington District of Marion County, valued at from $200,000 to $250,000. The case is styled the **Whyel Coal Co. vs. the Flat Run Gas Coal Co.**, and others. The Whyel company brought a suit to enforce an alleged contract of sale by the Flat Run company to the Whyel company of a large area of coal in the Pittsburgh vein. The Flat Run company has refused to convey the acreage of coal, and therefore the plaintiff is seeking to have the court enter an order compelling the defendant to convey the acreage of coal to the Whyel company.

After a year or more of preparation the **Nelson Fuel Co.**, whose property is reached by the Greenbrier & Eastern, in the newly developed Greenbrier field, has started the mining and shipment of coal on a large scale. This company is headed by John B. Laing of Lewisburg. Other companies at Quinwood and at other points on the Greenbrier & Eastern are also producing smokeless. With such mines in operation, the Sewell Valley R.R., a switch-back road connecting the Greenbrier & Eastern with the Chesapeake & Ohio, is handling more than 100 loads of coal a day.

For the third time within recent years, a destructive fire has wrought heavy damage at Holden, operating headquarters of the **Island Creek Coal Co.**, one of the largest producing companies in West Virginia. The electrical room and machine shop of this company were destroyed by fire a few days ago, the loss being between $60,000 and $75,000. The cause of the fire has not been determined. A few years ago the company lost a large tipple through fire and about three years ago the store and office building were destroyed. Plans and specifications have been prepared for a new machine shop and electrical shop.

WISCONSIN

Percy Braman, president of the Braman Fuel Co., Milwaukee, who has been serving as Commissioner of Public Works of that city for the past seven or eight years, has retired from office and will devote his entire attention to the coal business in future.

The wooden anthracite shed of the **Callaway Fuel Co.**, which is one of the old land-marks of the upper Milwaukee River coal district, is being razed to give way to a modern steel structure.

The North-Western Fuel Co., is making extensive repairs and improvements to its dock yards at Washburn. About 300,000 tons of coal are handled by the company annually.

BRITISH COLUMBIA

The re-opening of the workings of the **Carbondale Coal Co.** is contemplated. This property is near the City of Cranbrook and some of its citizens are interested. It is estimated that $25,000 would be required to assure early production.

In giving evidence before the Knowles Conciliation Board, at Fernie, W. R. Wilson, president of the **Crow's Nest Pass Coal Co.**, the biggest operating concern in District 18, U. M. W. A., stated that on the actual investment of $6,200,000 the average dividend paid by his company between 1910 and 1921 was 2.46 per cent; the average dividend prior to 1910 had been 2 per cent. The average daily wage paid to contract miners in 1921 was $9.13, an increase of 125.5 per cent compared with 1910; the average paid to day work miners was $7.75, an increase of 152.5 per cent. A general reduction in operating expenses must be made, if Crow's Nest field expects to remain in the competitive **Manitoba** market.

Recent developments in connection with the coal mining industry of Vancouver Island are encouraging. New deposits of coal have been opened up in the Reserve Mine, **Western Fuel Corporation of Canada**, and in the Farm Mine, Comox, **Canadian Collieries (D) Ltd.** The collieries have been working steadily and the output is being well maintained. It is not anticipated that the mines of the Island will be affected by the strike as the wages are still being regulated by the Dominion fair wage officers.

WASHINGTON, D. C.

M. R. Campbell, of the U. S. Geological Survey, is studying the geology and physiography of that part of the Shenandoah Valley in which the newly discovered caverns are located.

W. C. Alden is in Montana to continue his studies of the tertiary and pleistocene bench gravels and glacial phenomena in the plains of eastern Montana and western North Dakota.

A party in charge of **R. H. Sargent** is en route to Alaska to make topographic and geologic surveys in the Cold Bay oil region. Mr. Sargent will be assisted in the topographic work by **R. K. Lynt.** The geologic work will be done by **A. A. Baker** and **W. R. Smith.**

R. T. Price has been endorsed by the Oklahoma Coal Operators' Association to succeed himself as a director of the National Coal Association. **Walter Barnum** has been elected by th Washington Coal Producers Association as its representative on the National Association's directorate. **S. L. Yerkes** has been similarly designated by the Alabama Fuel Association.

The House Committee on Mines and Mining has decided to adhere to its former action in reporting to the House for passage the bill to acquire land now leased by the **Government Fuel Yards** of the Bureau of Mines in the District of Columbia. Retail coal interests had urged the committee to reconsider its action on the ground that the retail coal trade of the District should enjoy the Government business and that the operation of the fuel yard was more expensive than by private industry.

Traffic News

The Norfolk & Western Railway Co. has applied for authority to issue $6,700,000 in securities to purchase four thousand 70-ton all steel hopper coal cars.

Construction work will commence at once on the Castleton Bridge and "cut-off" improvement of the **New York Central Railroad**, under plans providing for rapid work on a scale that will bring it into operation within two years. This work calls for an ultimate expenditure of approximately $20,000,000. The new bridge will be located about twelve miles south of Albany.

The Southern Railway System has just completed and opened a double-track bridge over the Ohio River at Cincinnati, which should aid it materially in handling its coal traffic through that city. Work of rebuilding started in July of last year, and the bridge was opened the second week of May.

In the complaint of the **Manufacturers' Association of Connecticut** an I. C. C. examiner recommends that rates on bituminous coal from certain Long Island Sound ports in Connecitcut and Rhode Island to inland Connecticut destinations during Federal control were unreasonable.

In the complaint of the **Little Fork Coal Co.**, an examiner recommends that claim for refund on shipments during Federal control are barred by the statute of limitations. Refund is denied for want of proof on shipments of bituminous coal shipped subsequent to Federal control from Willard, Ky., to Cincinnati, points in the Cincinnati switching district and points in central freight association territory.

The Utah Supreme Court has affirmed the award of the District Court which allowed the **Jeremy Fuel & Grain Co.**, Salt Lake City, $58,962.80 in the suit against the Denver & Rio Grande Western Railway, claimed to be due for overcharges on coal shipments from points in Carbon County to Salt Lake City and a charge of $1.60 per ton was demanded and paid. Other coal companies were interested in the suit.

The I. C. C. has suspended until Aug. 17 proposed reductions ranging from 20c. to 74c. per ton on bituminous coal from mines in Arkansas, Missouri, Oklahoma and Kansas to Omaha, Nebr.

The Central Iron & Coal Co., of Holt, Ala., has complained to the I. C. C. against unreasonable rates on coal from Liberty Mine, Ala., to Kellerman, Ala.

The L'Anguille River Ry. Co., has requested the I. C. C. to hold that rates on lump coal from Kentucky mines on the Illinois Central and the L. & N. to Marianna, Ark., are unreasonable. The commission is asked to reduce the rates from $3.54 to $2.57.

The complaint of the **Perry County Coal Corporation** has been assigned for argument before the commission in Washington June 21, and that of the **Willard Coal Co.**, June 23.

Argument will be heard by the I. C. C. June 8 in the case involving routing of coal from **Western Maryland Ry. Mines** to Eastern destinations; and on June 15 the complaint of the **Omaha Lumber & Coal Co.**

The Citizens Coal Mining Co., has requested a rehearing in its case in which the commission recently found that rates on bituminous coal from Citizens Mines A and B in the Sprngfield, Ill., district to various destinations during Federal control were not unreasonable.

The commission has dismissed the complaint of the **Northwestern Pennsylvania Coal Operators' Association** which related to rates on coal from mines on the Bessemer & Lake Erie and Western Allegheny railways to markets in New England located on the Boston & Maine and New Haven railways. The complainants had asked for the same rates as were in effect from mines on the B. & O. The commission said the proceeding had been satisfied to the complainants. Similar action has been taken in the complaint of the **Republic Coal Co.**, relating to rates on soft coal from West Frankfort, Ill., to La Crosse, Wis.

The commission has directed the Director General of Railroads to refund $560 to the **Michigan Builders Supply Co.**, because of an unreasonable rate charged on anthracite from points in Pennsylvania to Detroit.

The Virginian Railway has leased the **Virginia & Western Ry.**, operating over 14 miles in the coalfields around Maben, W. Va., and will operate it as an adjunct to the Virginia. It is expected to develop large additional coal fields for this line, which has its outlet at Sewalls Point.

The Baltimore & Ohio R.R. Co. has placed an order for 50 new cars for use in passenger train service, including 40 coaches, 2 dining cars, 3 combination baggage and mail cars and 5 postal cars. This equipment will be constructed by the Pullman Company, of Chicago, for delivery late in August or early in September.

The I. C. C. has decided that the rates on run of mine bituminous coal from mines in the Brazil, Ind., district to the plant of the **Hydraulic Press Brick Co.**, at Brazil during Federal control were unreasonable because they exceeded 45c. a ton.

The I. C. C. has assigned for further hearing the complaint of the **Wasatch Coal Co.**, which assailed certain intrastate rates during Federal control as unreasonable. The railroads had moved to dismiss the complaints because of failure to specifically allege violations of the acts administered by the I. C. C. The commission says these complaints sufficiently and fairly present for its consideration and determination alleged violations of Federal laws which the commission has jurisdiction to administer and orders the case set for further hearing.

The commission has decided that rates on bituminous coal from West Clinton, Ind., to Ottumwa, Ia., and reconsigned to various points in Iowa and Nebraska are not unreasonable.

Obituary

Captain R. H. McLean, master of the American Str. Sewall's Point of the Castner, Curran & Bullitt coal fleet, died in New York recently. He was the ranking master of this company, having served for 20 years.

Frank Watson Bale, former general freight agent for Buffalo, Rochester & Pittsburgh R. R., and for more than thirty years a resident of Rochester died recently at his residence there. For more than 20 years Mr. Bale was connected with the B. R. & P. in different executive positions.

Shelby Kinkead, 68 years old, president of the Kinkead Coal Co., a great grandson of Isaac Shelby, first governor of Kentucky, died at his Lexington, Ky., home recently, following an illness of several months. He was one of the pioneer coal men of Lexington.

Frank H. Tillinghast, of the firm of F. H. and F. W. Tillinghast, coal dealers of Central Village, Conn., died recently at his home in that town. He had been in the coal business practically all his life.

Trade Literature

Deschanel Cableway Bulletin—Deschanel Engineering Corp., 90 West St., New York City. Pp. 6; 8½ x 11 in.; illustrated. Describes the use of the cableway for unloading material directly from railroad cars, and barges to ground storage, other secondary storage, or direct to the boiler house bunkers and coal bins.

Locomotives.—Geo. D. Whitcomb Co., Rochelle, Ill. Bulletin 2209. Pp. 15; 7¾ x 10¾ in.; illustrated. Contains a short sketch of the history of the company and its facilities. The photographs shown include locomotives built by the company in the early days of its existence, those used during the war, permissible locomotive for use in gaseous mines and present 12-ton gasoline locomotive for indusrial use.—Advertiser.

Worm-Drive, Storage Battery Locomotives. Geo. D. Whitcomb Co., Rochelle, Ill. Bulletin 2210. Pp. 15; 7¾ x 10¾ in.; illustrated. Describes different sizes of worm drive locomotives, with their separate parts. —**Advertiser.**

Whitcomb Six-Ton, Positive Gear Drive Locomotive. Geo. D. Whitcomb Co., Rochelle, Ill. Bulletin 2212. Pp. 15; 7¾ x 10¾ in.; illustrated. Designed originally for road work, this locomotive is now used in many other industries.—Advertiser.

Coke Quenching Cars. The Wellman-Seaver-Morgan Co., Cleveland, Ohio. Bulletin No. 70. Pp. 8; 8½ x 11 in.; illustrated. Describes how, on account of the destructive effects which ordinarily shorten the life of coke quenching cars, these cars are designed to withstand the heavy work put on them.

Publications Received

Schedule 10-A. Procedure for establishing a list of permissible electric hand lamps, trip lamps, animal lamps and rescue lamps for use in gaseous mines, has just been issued by the United States Bureau of Mines. The schedule contains information regarding fees, character of tests and conditions under which tests and inspections of these types of lamps will be made by the Bureau of Mines at its Pittsburgh, Pa., experiment station.

Specifications for Petroleum Products adopted by the Interdepartmental Petroleum Specifications Committee. Bureau of Mines, Washington, D. C. Technical Paper 305. Pp. 40; 6 x 9 in.

Production of Gasoline by Cracking Heavier Oils, by E. W. Dean and W. A. Jacobs. Bureau of Mines, Washington, D. C. Technical Paper 258. Pp. 56; 6 x 9 in.; illustrated. Describes results of experiments of cracking processes, with tables.

Pulling Together, by John T. Broderick, with introduction by Charles P. Steinmetz, Ph.D., Robson & Adee, Schenectady, N. Y. Pp. 141; 5 x 8 in. An interesting conversation supposed to have taken place in a Pullman smoking compartment on industrial management.

Our Unconscious Mind—And How to Use It, by Frederick Pierce. E. P. Dutton & Co., 681 Fifth Avenue, New York City, $3. Pp. 323; 5 x 8 in.

Simplified Uniform Accounting System for Retail Coal Merchants.—Published by National Retail Coal Merchants Association, Phila., Pa.

The Sugar-Tube Method of Determining Rock Dust in Air, by A. C. Fieldner,, S. H. Katz and E. S. Longfellow. Department of the Interior, Bureau of Mines. Technical paper 278. Pp. 42; 6 x 9 in.; illustrated.

Coal Resources of District IV, by Gilbert H. Cady, Illinois Mining Investigations. Bulletin 26. Pp. 247; 6 x 9 in.; tables, maps and charts. Prepared under a cooperative agreement between the Illinois State Geological Survey Division, the Engineering Experiment Station of the University of Illinois and the U. S. Bureau of Mines.

Coal, A Few Things the Public Wants to Know—Published by the Illinois Coal Operators' Association, Chicago, Ill. Pp. 24; 9 x 4 in. Contains reprints of press releases during the last six weeks compiled by the Association.

Bulletin of the Carnegie Institute of Technology, Series 17, No. 1. Published monthly by the Carnegie Institute of Technology, Pittsburgh, describing the co-operative mining courses of the Department of Mining and Metallurgy, College of Engineering.

Tenth Annual Report of the State Inspector of Mines for New Mexico for the year ending Oct. 31, 1921. Pp. 65; 6 x 9 in.; tables.

The following-named publications have recently been issued and may be obtained by applying to the Bureau of Mines, Washington, D. C.:

Serial 2306, Momentary heating of inflammable coal dusts.

Serial 2308, Safety of mine-type telephones.

Serial 2309, Compressed-air blowers as an aid to metal-mine ventilation.

Serial 2310, Growing need for preservation of mine timber.

Coming Meetings

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

The American Wholesale Coal Association will hold its annual convention at Detroit, June 1 and 2. Secretary, G. H. Merryweather, Union Fuel Bldg., Chicago.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at Trenton, N. J., June 7 and 8.

American Institute of Chemical Engineers will hold its summer meeting at Niagara Falls, Can., June 19-22, with headquarters at the Clifton Hotel. Secretary, Dr. J. C. Olsen, Polytechnic Institute, Brooklyn, N. Y.

Southwestern Interstate Coal Operators Association will meet June 13 at 519 Keith & Perry Bldg., Kansas City, Mo. Secretary, W. L. A. Johnson, Kansas City, Mo.

Illinois Mining Institute will hold its summer meeting June 8, 9 and 10 on the Mississippi River, the boat leaving St. Louis, Mo., on June 8. Secretary, Martin Bolt, Springfield, Ill.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, Editor

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The "Touchy" Price Question

WHILE this week's *Coal Age* is on the press there is meeting in Washington the second gathering in the history of the bituminous-coal industry looking to voluntary price fixing. The story of the Lane-Peabody price agreement in 1917 is too well known to bear repeating. There is an aspect of its failure, however, that is not so well known—the now established reason for its failure. It was not that those prices were too high or that the action of coal operators at that time was not high minded but that the Department of Justice was simultaneously attempting to convict under the Sherman Act a group of coal operators for having exactly the same prices. The administration condemned in the one instance to lend color to its charge in the other. That no such suit is now pending may help this second effort to success.

It is being plainly stated, both within and without the coal industry, that a runaway coal market during the strike will be the straw to break the camel's back. Impending regulation in some form will cease to be pending; it will become the fact. The "hard-boiled" say: "Let it come; what can they do to us? The Constitution is yet in effect." The conservative minded have no desire to precipitate trouble. They represent the bulk of the tonnage that is now being produced and they are ready and willing to co-operate with the government in every ligitimate manner to restrain the rising price of coal.

The issue on which the operators now producing coal are called upon to act is so simple as hardly to require statement. The dislocation of supply, otherwise temporarily sufficient for the country's needs, and consequent speculation, has caused a sudden and not unexpected rise in price of coal. There is every indication that if left unhampered the price will soon reach such a point as to constitute a national scandal, repeating the experience of 1920. The public is mighty touchy on this question of coal and high coal prices will most certainly relight the powder train that has already on several occasions almost reached the magazine in Congress. This week's slump in prices is temporary.

To protest against even informal interference on the ground that were prices allowed to run wild for the remainder of 1922 a majority of coal companies would not average for the years 1921 and 1922 more than a fair and reasonable profit is to make ammunition for those who maintain that the coal-producing business is so intermittent that the government should take a hand in stabilizing it. It is manifestly unfair to deny to an industry the profit that seldom falls to its lot, but it is foolish not to recognize that coal is an industry that cannot afford to take that profit this year. It rankles to know that the price of coal must be held down that the automobile industry may reap an even greater gain. The railroads and public utilities, that much-regulated group, fare on the average better than coal, free and legally untrammeled though it be. That may be one of the penalties this industry pays for its freedom.

Preliminary announcements of the administration's plan lead us to anticipate the formulation of "fair-price" committees in the several now producing fields, determination of voluntary maximum prices, and offers to provide every needy consumer with direct contact with a producer. The difficulty comes in carrying the plan in convincing manner before each of the 1,500 producers now at work, and in getting before the public the fact that the minority in number and smaller minority of tonnage that will not elect to go along with the majority and the government are not cause for "direct action" by Congress.

Self-restraint in this instance will pay. Operators, whether union or non-union, are equally interested in winning the strike. A scandal in prices will precipitate a settlement of the strike unfavorable to the operators and will end the opportunity for the non-union operators to participate in a good market. It is a fair assumption that those who will refuse, either openly or covertly, to join in holding down prices at this time are the same who excel in cutting prices at other times. Another evidence of the competitive nature of the bituminous-coal industry and the lack of any combination on prices.

The Head of the Camel

LABOR, the problem that hitherto has been taboo—not by constitutional provision but by mutual consent—from the councils of the National Coal Association, is now to be admitted on probation. The association in convention assembled last week in Chicago elected officers and heard committee reports and might have adjourned without other action had not the discovery accidentally been made that Labor is the big problem, and that the National is big enough to recognize and even to consider it.

Just how far this may lead one may but guess at this time. The platform, as stated by A. M. Ogle in his opening address as incoming president, is sufficiently exclusive to bar from consideration all but one aspect of the labor problem. Mr. Ogle indicated that the National Coal Association would take no part, give no advice or counsel or interfere in any way with the labor policies of any group or field. Interpreted, this means that there will be no national labor policy for the bituminous-coal industry. It precludes a policy through this national organization for the already organized fields. The one program on which all elements in the National, comprising as it does both union and non-union operators, have agreed was stated by Mr. Ogle to be the forcing of the United Mine Workers to a degree of responsibility before the law equal to that devolving upon the operators. Mr. Penna, in an address to the convention, said that the irresponsibility of the union is its greatest asset and that the leaders spend their time and effort capitalizing that asset to the disadvantage of the operators. The full weight of the strength and resources of the National Coal Association thrown into an effort to force the incorporation of the United Mine Workers would inaugurate a new step in industrial relations in the coal industry.

It would be entirely logical for this policy of the National to develop to a point permitting this organization to appear before a wage tribunal such as may eventuate to bring settlement in the present strike. Two years ago the National hestitated over a simple declaration of belief with respect to freight rates. This year the presentation of the stand of the coal industry on reduction of rates was handled by the officers of that organization. The coal industry as a whole wanted lower rates and as a whole it presented its case. Local differences were not discussed but left to the localities affected. So may the coal operators seeking universally lower wages in the union fields come to present their case through their larger organization. As a matter of fact the National has been doing far more toward getting certain aspects of the wage situation before the public than any local group.

Why Wait?

IN 1903 coal was selling furiously. Prices of coal land were soaring. Materials were high, but everybody was buying with all that they could borrow. In all extensible districts new mines were opening almost daily.

At that time a canny old fellow was preparing to open a mine, but he insisted that he was in no hurry. There was, he thought, plenty of time. He didn't like to open a new plant when prices were so high and when labor asked so much for its service. He preferred not to work in the dust that other men raised. He believed it best to be busy when others were slack, to build his tipple and open his mine when it was easy to get labor and get it at his own price. So he waited expectantly for bad times.

Compared with the future just ahead these are "bad times." Prices are low, men are reasonably easy to obtain, machinery is readily bought and when bought promptly delivered. Copper is for most producers sold below cost. It is sure to go higher. The price of iron and steel is more likely to rise than recede. Rubber is relatively cheap. The markets are rapidly improving, so that before long prices will be high for product and for the machinery by which the output is obtained. Now is the time to put the house in order for the days of prosperity approaching. Must we wait for the time when everyone else is buying, raw materials are high, manufactured articles higher, labor indifferent and high priced? The way of profit is to buy when others wish to sell, to sell when others crave to buy, to take the road that others leave, to journey on alone like the man who delayed opening his mine till less prosperous times arrived.

In playing your own game all alone before your competitors crowd in to raise your costs you provide for profit. You will work to better advantage when you work a step or two ahead of the other man. However, if you must have company you will have some now, for quite a respectable number of companies are making improvements, but not nearly as many as there will be when general business is at peak, as everyone at any cost and regardless of interferences to operation will be seeking then to put his mines in order for large production and they will find it can't be done. So why wait? A better time than now to prepare for the future will never come.

Industrial Factors of Safety

MUCH has been said during the present coal strike about overdevelopment and monoplies. The anthracite industry is condemned as a monopoly because it can barely get out enough product to satisfy the public. It has a factor of safety of about 1.1, and hardly that if we figure on a really cold winter. That is why it is condemned as a monopoly.

The bituminous industry has a factor of safety of around 2. Figuring on 1918, however, the factor is somewhat smaller. In prosperous years we hear it described as a monopolized industry because its combined factor of safety with that of the railroads is such that it cannot always supply all that the public demands when the people become panicky and want all their coal in a single month.

All industries have factors of safety. It would be dangerous if they did not have them. Even if the industries were controlled so that the charges of producers could not be inflated, the middlemen would inflate prices or those using the products in their industries would ask excessive returns, finding that their competitors could not produce or that the buyers of the manufactured product had less to sell than the demand called for and so could afford to boost prices.

A factor of safety is provided by nature wherever animal and vegetable life thrives—for instance, too much water, excessive oxygen under a pressure greater than will support life, more nitrogen than vegetation needs for sustenance, more heat from the sun than the earth can use, more time for fructification than plants need. If it were not for such factors of safety, life would be unendurable, or, rather, life would cease to exist.

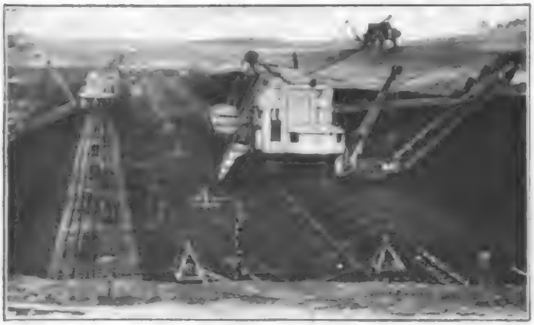
The "wonderful one-horse shay" is not the basis on which the world is constructed. There is a margin everywhere, especially in essentials. It is well that in the world there is a margin of necessary things, and coal, being one of the greatest of necessities, needs more, not less, margin. Let us hope that there always will be a factor of safety.

It would not do to have this nation fitted so perfectly with the garment of its industrial life that every time it turned or exerted itself, the garment would part. A little looseness will give much comfort. Anything else is a straitjacket.

The bituminous-coal industry has a somewhat excessive safety factor. So have the iron and copper industries. After a year of idleness the Marquette and Gogebic iron ranges are going back to work. After about a year's suspension the porphyry coppers are getting busy. The Michigan coppers likewise have had quite a long period of idleness. To use expressions familiar to those who follow the attacks on the coal industry, iron is sick but getting better. Copper also has been functioning badly but is recovering. Of their recent idleness we say, "It is too bad," affording them sympathy; of bituminous coal we say, "It is too wicked," apportioning it censure. What a remarkable thing is public opinion! "What fools these mortals be!"

Golpa Plant Dry Dredges Lignite and Operates Central Power Station

BY GEORGE FREDERICK ZIMMER
London, England



Brown Lignite Averaging Forty Feet in Thickness but Half Water Mined by Removing Sixty Feet of Overburden by Bucket Excavator—Central Power Plant Uses 7,000 Tons of Coal Daily

MANY stories have been told concerning the present activity of industrial Germany, some from personal experience and some from hearsay. Some of these stories may be true, but most of them have passed from lip to lip so often that it is difficult to say how much they may have lost or gained during transit.

The situation as a whole is so complex that if any industry desires to obtain a true picture of existing conditions it is necessary to send someone who specializes in that particular line. As it is, reports are generally written either by an all-round journalist or an economist. Under such circumstances it has occurred to me to investigate personally my own particular subject, industrial management generally, and conveyor engineering in particular, and to prepare a reliable account of it, for which purpose I traveled through the industrial areas by rail and road for close on two thousand miles to obtain first-hand information.

It hardly can be said that the present industrial recovery of Germany began at the cessation of hostilities, for the same or similar conditions obtained more or less during the war; in fact, before it began.

The difficulties principally met with then and now are shortages of fuel, transportation, raw material and man-power. Though these four difficulties affect every German industry, only the two former enter prominently into this inquiry, and as they are closely allied it will be well to consider them together.

During the war coal was monopolized, directly or indirectly, for the production of war material, transport of troops, the commissariat, etc., whereas it is now handed over to the victorious Allies as part of the indemnity. Industrial Germany is now, therefore, in the same plight as during the war. Little improvement has been made in general railway freight conditions, as a large proportion of the rolling stock which formerly carried troops and supplies is now occupied in taking coal westward to Belgium and France.

That coal is still extremely scarce is demonstrated by signs unmistakable to anyone who, like myself, travels through the industrial areas by rail and road.

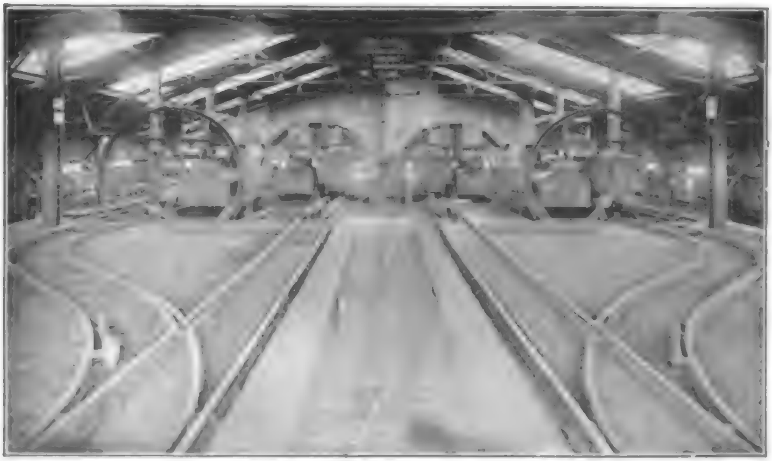


FIG. 1

Tipple Floor

This floor has no less than six revolving dumps, the loaded car in four of them entering on one side, being dumped and inverted till it comes up on the opposite side of the dump. The two side revolving dumps, which are smaller, are used as lubricating tipplers.

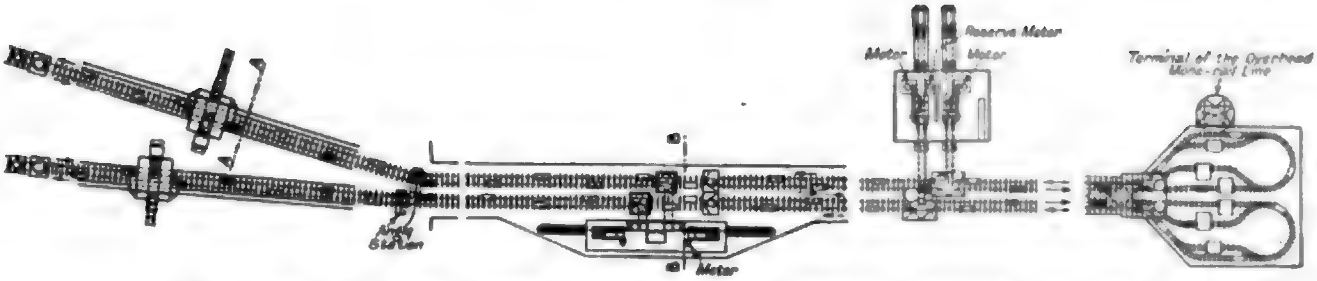

Reserve Motor
Motor
Motor
Terminal of the Overhead Mono-rail Line
Angle Station
Motor

FIG. 2. PLAN OF THE TWO CHAIN HAULAGE PLANTS BRINGING LIGNITE FROM THE WORKINGS TO THE POWER HOUSE

Cars leave the shovels every 15 sec. in a steady procession and travel toward the rotary dumps in the building on the right after passing through which they are returned to the shovels. Transportation is thus automatically controlled and the two shovels can load easily and with methodical regularity 7,200 tons in a day's run.

In every ten or twelve trucks of fuel one will see about one truck containing run-of-mine coal, the rest being loaded with peat, lignite, slack and briquets.

During the war, to save freight, some official organization decreed that every industrial establishment must be supplied with fuel from the nearest available source. While this wise precaution was, and still is, helpful to Germany's industries, it was but a side issue. It affected but a small proportion of the coal handled, and in no way assisted to solve the main problem—that of supplying coal to power stations, etc.

In normal times coal was readily obtained in sufficient quantity for the production of electrical energy, but the inefficiency of the railway system and the cost of transportation gave the central power stations much trouble. It was recognized that the railroads would be more equal to the service demanded of them if the stations were erected at the mines, thus relieving the railroads of the burden of hauling so much coal.

From the foregoing the reader will understand that the need for industrial reconstruction was necessarily of older standing than the cessation of hostilities. None the less, the scarcity of coal and the lack of transportation facilities during the war have proved incentives greater than any others past or present toward economic reconstruction and have been responsible for phenomenal developments in this direction.

There can be no doubt that the difficulties in which Germany found herself during the war inspired her thinkers, and not in vain. The normal order of things has in some cases been reversed, in others valuable improvements have been made which will be of lasting benefit both to her and to other nations and which, but for the war, might have taken generations to develop.

Germany's difficulties are being overcome in two ways, viz.: By the use of labor-saving devices and by the installation of central stations near fuel resources, which eliminate the wasteful practice of conveying large quantities of low-grade fuel from the collieries to the areas where heat, light and power are required.

The fundamental idea of generating power at the mine for general distribution had, of course, been put

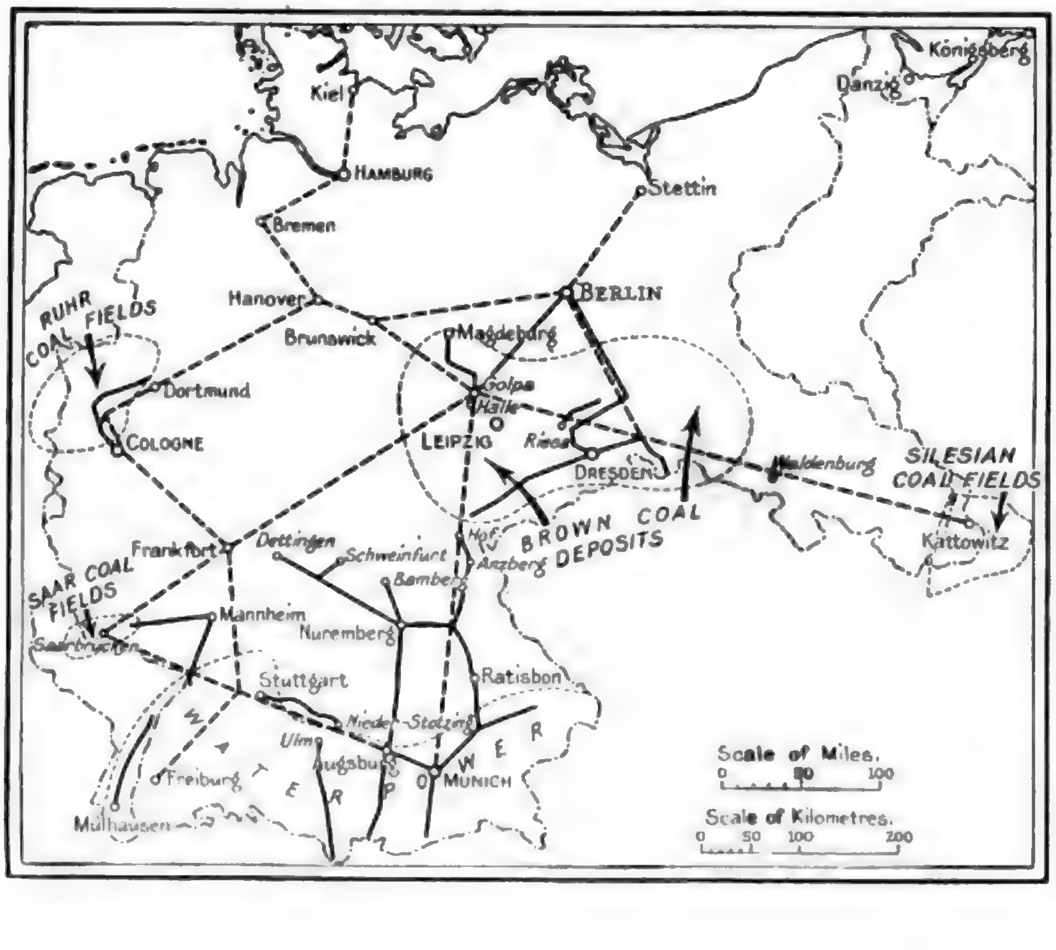

Kiel
Königsberg
Danzig
Hamburg
Stettin
Bremen
Berlin
Hanover
Brunswick
Magdeburg
Ruhr Coal Fields
Dortmund
Golpa
Halle
Leipzig
Riesa
Cologne
Dresden
Waldenburg
Silesian Coal Fields
Kattowitz
Brown Coal Deposits
Frankfort
Dettingen
Schweinfurt
Hof
Arzberg
Bamberg
Saar Coal Fields
Mannheim
Saarbrucken
Nuremberg
Stuttgart
Ratisbon
Nieder-Stotzing
Ulm
Augsburg
Munich
Freiburg
Mulhausen
Water Power
Scale of Miles.
0 50 100
Scale of Kilometres.
0 50 100 200

FIG. 3

Germany and Its Super-Power Stations

Some of these stations are merely on paper. Others already are constructed. The German people have not hesitated to put up large power stations where there is a scarcity of water. At the Golpa plant, it will be noted, not enough water was obtainable that they could afford to use it for the flushing of ashes. The thick bed of lignite, comparatively lightly covered and unusually thick though of low quality, justified the construction of a plant with no river bigger than the Mulde to furnish the water supply. The plant is most conveniently located to the big cities, Berlin, Dresden, Leipsic, Halle and Magdeburg.

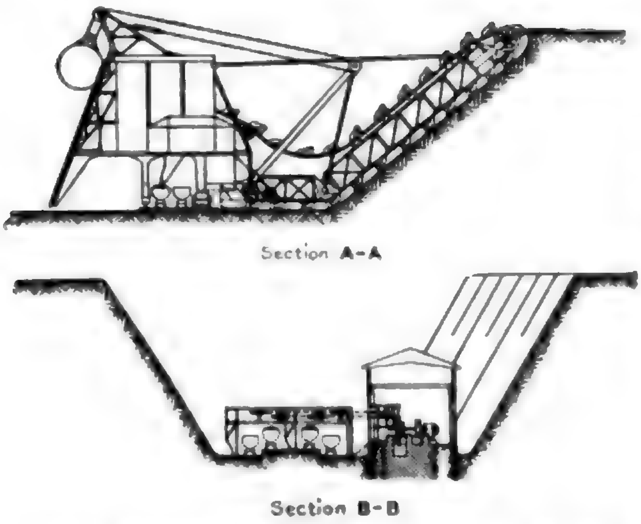


FIG. 4. SECTIONS OF SHOVEL AND MOTOR HOUSE

These are taken at A-A and B-B of the plan shown in Fig. 2. They show how the haulage chains are actuated and the coal excavated.

in operation in America by the Duquesne Light Co. in 1912, the current being distributed in Beaver and Allegheny Counties, Pennsylvania, over an area of 1,154 square miles. In accordance with the plan to build central plants at the mine the large Zschornewitz-Golpa plant was built near a large deposit of brown lignite near Halle, of which it uses about 7,200 tons per day. The lignite which is used comes wholly from one pit which delivers fuel solely to the power plant.

The area of this stripping is 2,470 acres, and the thickness of the coal varies from 9 ft. to 71 ft. 6 in. and averages 40 ft. 3 in. The depth of overburden varies from 6 ft. to 112 ft. and averages 59 ft.

One of the fundamental conditions justifying the erection of a super-power plant is a fuel supply which will outlast the life of such a plant. This is the case here at Golpa, where, with an annual generation of 800,000,000 kw., the estimated coal supply will last for 40 years.

The Golpa coal contains 53 to 55 per cent of moisture and approximately 5 per cent of non-combustible matter; it contains much "fine coal," and also from 20 to 30 per cent of large lumps up to and including pieces of 10-in. cube. It is therefore necessary to employ crushing machinery to reduce the coal to more uniform size.

After removal of the overburden by chain dredgers the brown coal is recovered by steam navvies and bucket dredgers and shot into narrow-gage trucks, in which it is conveyed to the station by chain haulage. Owing to the large capacity—3,680 tons in 8 hours—and the method of mining the coal by steam navvy, such a system of haulage was the only practicable solution. Rope haulage might have been preferred, but chains were chosen on account of their great durability and convenience for hooking on and off automatically.

In order to cope with such large capacities the mine cars had to be made larger than is usual in German practice. Consequently they are designed to carry 1½ tons of coal. They are dispatched at the rate of one every 15 seconds, or 240 per hour. Should the main haulage break down an auxiliary plant, by working two shifts, can convey the necessary coal per day.

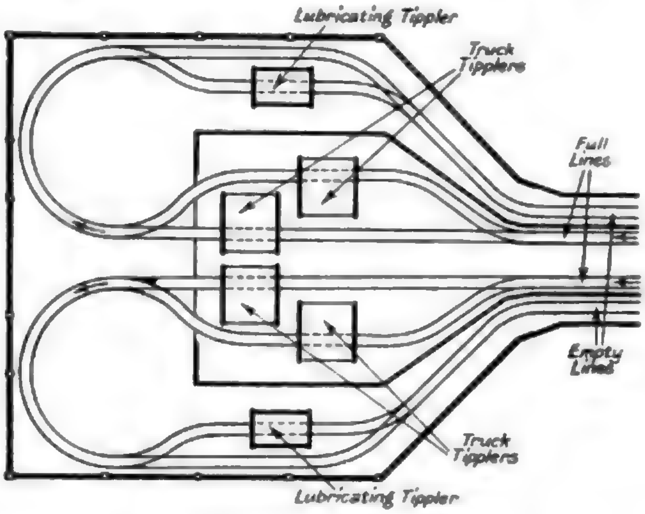


FIG. 6. PLAN OF TIPPLE FLOOR

Note that the cars are turned end for end after each journey instead of being back switched, as is customary in America. The dumps are well arranged in plan, so as to save in the width of the tipple.

Each of the lines is driven by a motor of 550 hp., with a third motor in reserve which can drive either of them through a clutch. The power is transmitted by belt and a pair of cast-steel wheels, the head sprockets being about 9 ft. in diameter. The driving mechanisms of the chain hauls, both main and auxiliary, are located

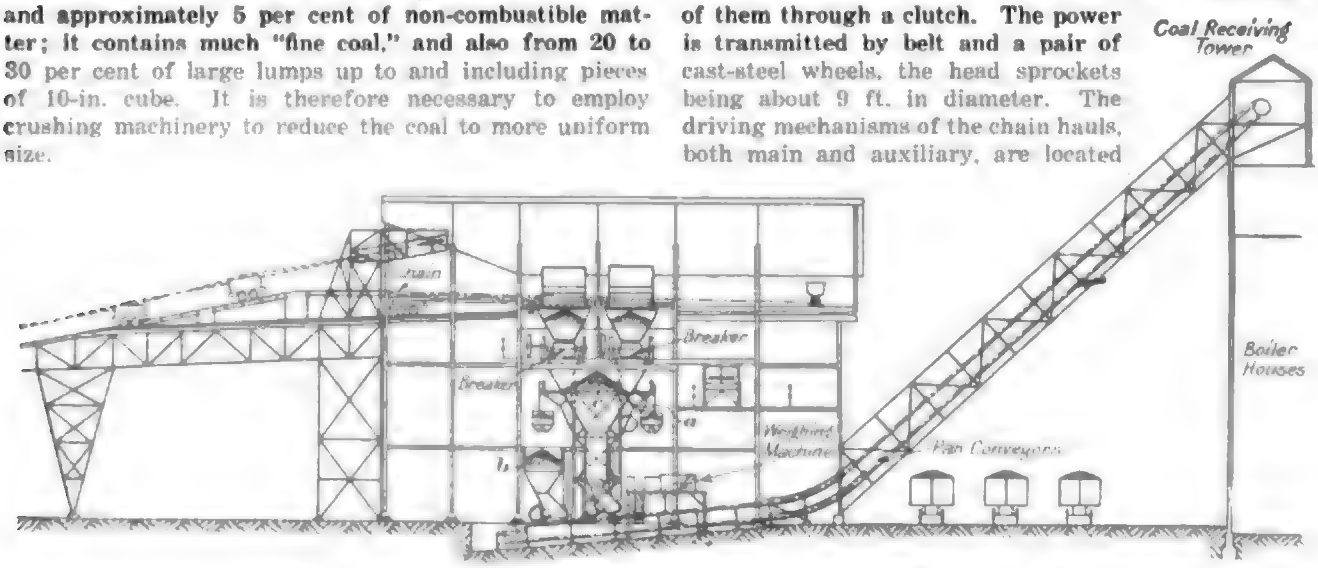


FIG. 5. LONGITUDINAL CROSS-SECTION OF THE COAL-RECEIVING PLANT

On the left is the chain haul by which cars are brought from the strip pit and dumped by rotary dumps into hoppers located above crushers (or breakers), whence the lignite, reduced to the correct size, falls into a large hopper, c. Thence it can be withdrawn onto a steel pan conveyor leading to the coal-receiving tower above the boilers or through the outlet chute to skips which carry it to the storage pile.

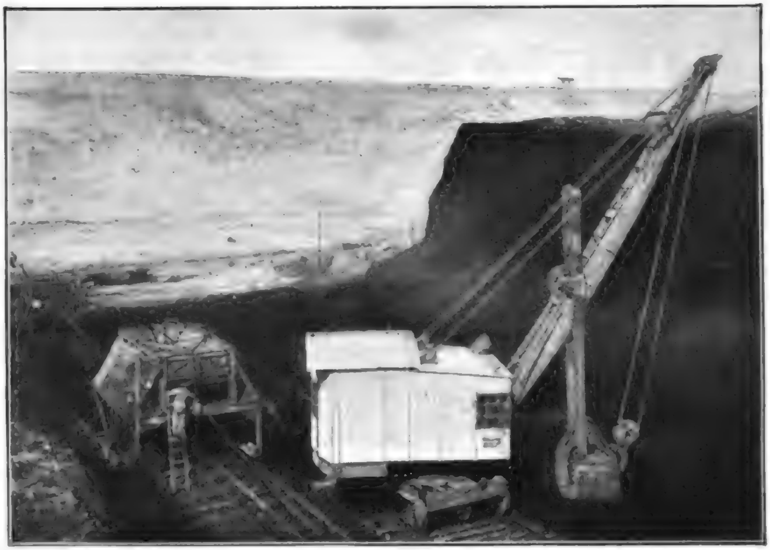


FIG. 7

Open Cast Workings

Power shovel at work with a receiving hopper by which haulage wagons are continuously fed, thus minimizing delays. The thickness of the seam and the character of the deposit make it advantageous to use a loading hopper to stabilize operations and have a load ready for every wagon as it arrives at the filling stations.

at the end of a bight in the chains and two spacious motor houses are erected for their accommodation. The take-ups also are located here. The supporting rollers, which prevent the chain from dragging, should the cars at any time be more than the normal distance apart, are installed at intervals of 26½ ft. An efficient safety device prevents the full trucks from running away in the event of a breakage of the chain.

At the receiving terminal of each line is an auxiliary chain haul which automatically feeds the two main lines. In connection with the two auxiliary lines there are angle stations which permit the receiving portion of the line to work at an angle with the rest. This angle can be altered from time to time as the coal is exhausted and it becomes necessary to re-lay the tracks. The receiving portion of the line consists of two tracks for the full and empty cars, beyond which there are three additional rails which support the dredge which digs the coal and deposits it in the cars.

The auxiliary chain hauls are of a maximum length of about 1,000 yd. from center to center, and the chains for these are composed of ¾-in. links. These chains are led around heavy terminal sheaves, where they are positively held and prevented from slipping. These wheels are also about 9 ft. in diameter. The tracks of both units are sufficiently far apart to allow ample space for men to walk between them.

At the receiving plant 2,000 yd. away the cars are

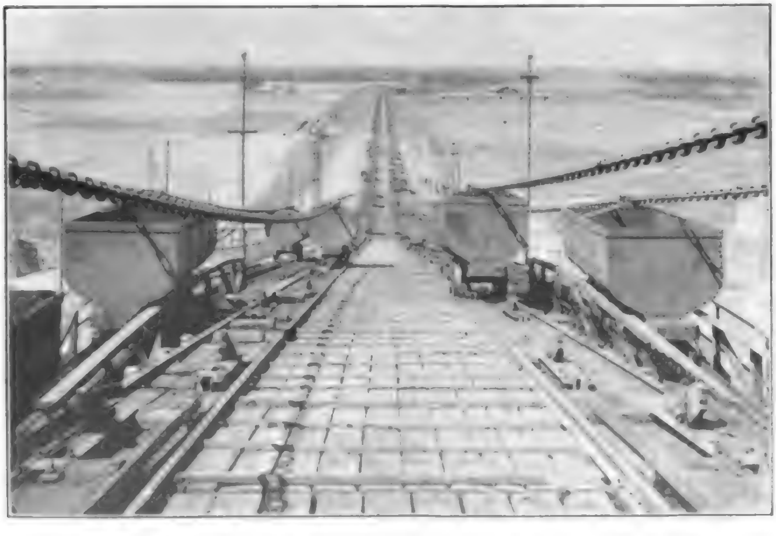


FIG. 8

Approaching the Dump

This shows the approach to the dump, which has been largely omitted in the plan so as to shorten the excessive length of the illustration. The break designating this part of the track will be seen in Fig. 2. Points to be noted are the attaching arrangements for the empty cars and the dogs for stopping the loads should the chain break or the attachment slip. The chains used in the haul are unusually heavy, being made of ¾ in. steel. The view is taken from the power house.

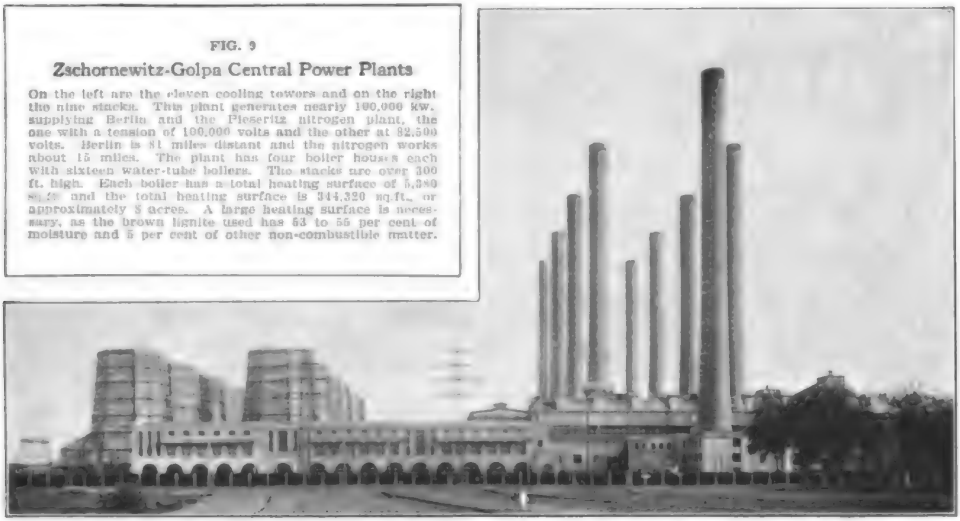


FIG. 9

Zschornewitz-Golpa Central Power Plants

On the left are the eleven cooling towers and on the right the nine stacks. This plant generates nearly 100,000 kw. supplying Berlin and the Pieseritz nitrogen plant, the one with a tension of 100,000 volts and the other at 82,500 volts. Berlin is 81 miles distant and the nitrogen works about 15 miles. The plant has four boiler houses each with sixteen water-tube boilers. The stacks are over 300 ft. high. Each boiler has a total heating surface of 5,380 sq.ft. and the total heating surface is 344,320 sq.ft., or approximately 8 acres. A large heating surface is necessary, as the brown lignite used has 53 to 55 per cent of moisture and 5 per cent of other non-combustible matter.

discharged to crushers by means of two-car rotary dumps. Coal leaving the crushers is dropped into a large bunker, *c*, from which it can be withdrawn, either through a delivery gate onto a steel pan conveyor or through an outlet chute, *a*, into the skips of a rope-actuated monorail system, which supplies a coal storage pile 175 x 30 yd. in ground dimensions. A traveling bridge crane supports a bight of the monorail track and forms an integral part of this system of conveyance. The coal is stored to a depth of about 15 ft. This relatively small stock, comprising three days' supply from the dump and from the overhead bunkers, is all that can with safety be stored, owing to the unstable nature of the coal. The pan conveyors which take the coal to the boilers pass at their lower ends over weighing machines which keep a record of the amount delivered to the boilers.

The coal is reclaimed from the dump by a two-rope clamshell of 9 to 10 cu.yd. capacity. This delivers into an overhead bunker from which the monorail skips are filled. These eventually discharge into a hopper (*b*, Fig. 5), which also feeds the two pan conveyors. At the loading and discharge points automatic devices couple the monorail skips on and off the hauling rope. By merely pushing the skips down a slightly inclined portion of the track an attendant can couple the skip to the hauling rope.

The two pan conveyors are entirely independent of each other; they are 4 ft. wide and 1 ft. deep and are provided with standing cross flights so that the steep, 45-deg. incline, by which the conveyors ascend, can be safely negotiated. This ascent is from the ground floor of the crusher house to the distributing tower, which at the end of the boiler houses is 85 ft.

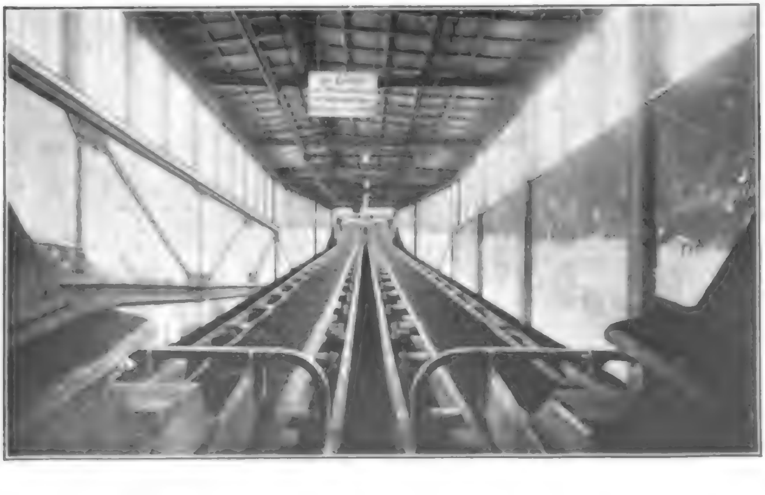


Fig. 10

One of the Conveyor Sheds

This shed connects the first two towers. The lignite is sticky and consequently portable oblique plows at first were employed to remove it from the belts. But these gave indifferent service and were found to be inferior to movable trippers, and so trippers were installed in place of the plows with more favorable results. Note the substantial walls on either side of the shed and the ends of the plank that keep the lignite from spreading to the belt edge.

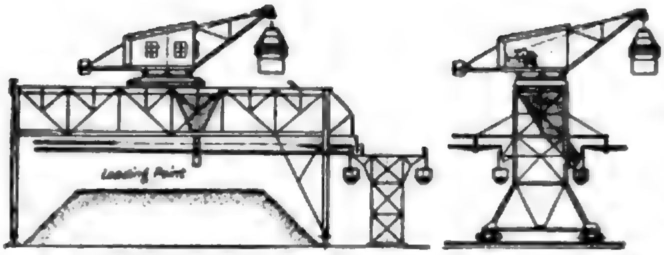


FIG. 11. STORAGE PILE WITH LOADING AND UNLOADING DEVICES

The skips pass over the pile and are dumped where desired. The clamshell bucket of the crane can be lowered and filled with lignite. This it discharges into a hopper which feeds it back into the skips which are emptied into the hopper marked *b* in Fig. 5. The storage yard measures 90 x 525 ft. The pile is 15 ft. deep.

above the ground. Four such towers are at present in use and two more are proposed. The two pan conveyors deliver into one of the towers, whence the coal is fed onto two longitudinal belt conveyors for one of the boiler houses, and also onto cross conveyors which carry it to the other boiler houses to the right and left. The belt conveyors are all duplicates. Fig. 18 shows two such conveyors in a shed connecting two of the towers. Owing to the sticky nature of the coal the intermediate delivery from similar belt conveyors in each of the boiler houses was first effected by portable oblique plows; this was rather an unsatisfactory solution and far inferior to a movable tripper. Indeed the plow proved a failure, and the ordinary tripper has since been installed.

The boiler-house bunkers are built of steel plates and are divided into two compartments so as to lessen the risk of fire spreading should the coal ignite spontaneously. The two belt conveyors for each double row of boilers were placed close to these partitions, one upon either side, but at a sufficient height so that each can discharge into either bunker.

As the angle of repose of the Golpa coal is nearly 60 deg., the bunkers, which hold about 140 cu.yd. for each boiler—enough for 18 hr.—have to be narrow and as deep as the fiery nature of the coal will permit. To make the bunkers wider would have increased their cost considerably and it would have yielded only a trifling additional capacity. The coal descends from the bunkers through rectangular diverging downcomers that discharge to the coal hoppers which feed the grates.

Owing to the large percentage of mineral constituents in this brown coal, provision had to be made for the removal and quenching of about 1,400 cu.ft. of ash per hour. A large part of the ash leaves the furnace at red heat and must be wet down, in order to prevent danger from fire. It is impracticable to quench the ashes in the ashpit on account of the steam that would be formed. The ashes are therefore loaded into cars, which are then made up into thirty-car trips and hauled by an engine a distance of about 330 yd. to the dump. Here they are discharged down an incline and quenched during their descent.

It was fully recognized by the designer of this power station that the method employed for removing the ashes was hardly in keeping with the otherwise well-chosen handling equipment. Flushing the ashes away was impracticable because of the scarcity of water. On the other hand, the pneumatic system of ash disposal was not adopted because practical experience with this system when handling large quantities of ashes of this kind, which differ materially from those derived from coal, was lacking. The fact also had to be taken into consideration that some brown-coal ashes when quenched will harden, like cement, if not kept in motion.

The large electric power plant furnished by this strip pit and boiler plant supplies Berlin, 81 miles distant, with current at a tension of 100,000 volts and the Pieseritz Nitrogen Works, 15½ miles away, with current at a tension of 82,500 volts. It was originally designed to furnish power exclusively for the production of nitrogenous fertilizers from the air in order to cultivate land efficiently during the war. The plant was erected in 1915 from designs by D. Klingenberg. It was at first intended that the plant should furnish 500,000,000 kw.-hr. per annum, with a peak load of 60,000 kw., but before completion the scope was enlarged to give a total output of 800,000,000 kw.-hr., entailing the consumption of over 7,000 tons of coal a day.

The steam plant comprises 64 high-angle water-tube boilers, sixteen in each of the four boiler houses, and discharging into nine stacks over 300 ft. in height. Each boiler has a total heating surface of 5,380 sq.ft. and an efficiency of 81 to 83 per cent, notwithstanding the relatively low heating value (1,100 heat units per lb.) of the fuel used, semi-gas firing being chiefly employed. The feed water is mostly drawn from the River Mulde, five miles away, and is delivered into reservoirs of a total capacity of 18,000 gal., whence it is pumped into Intze tanks built round the chimney stacks 80 ft. above the ground. From these tanks it flows into the purifying plant and thence into tanks on the ground level, where it is taken up by the feed pumps. The remainder of the water is obtained from the coal workings, purified and stored in settling tanks, which also receive the effluent from the cooling towers.

The engine house is arranged at right angles to the boiler houses; it is about 630 ft. long and 50 ft. wide and accommodates eight turbines, each of which is supplied by eight boilers with steam at 200 lb. pressure and superheated to 340 deg. C. The dynamos are run at a speed of 1,500 r.p.m. and generate 6,600-volt 50-cycle current, the output of the generators being 22,000 kw., or 16,000 kw. with a power factor of 75

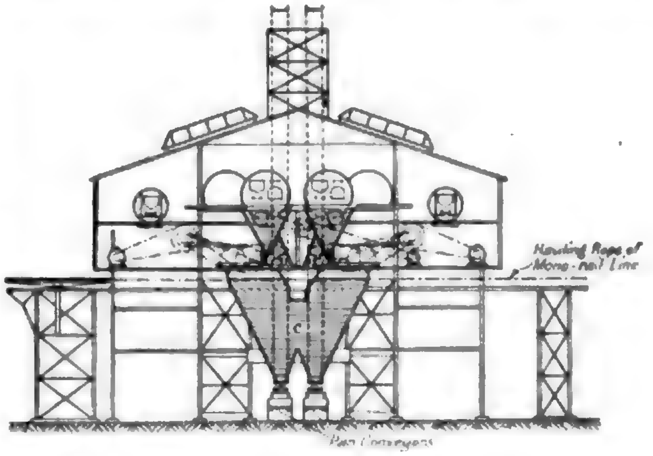


FIG. 12. CROSS-SECTION OF PLANT SHOWN IN FIG. 5

This shows the structure which supports the monorail system by which the coal for storage is carried in skips to the storage pile shown in Fig. 11. The large size of the main hopper, *c*, can be judged from this view and that in Fig. 5.

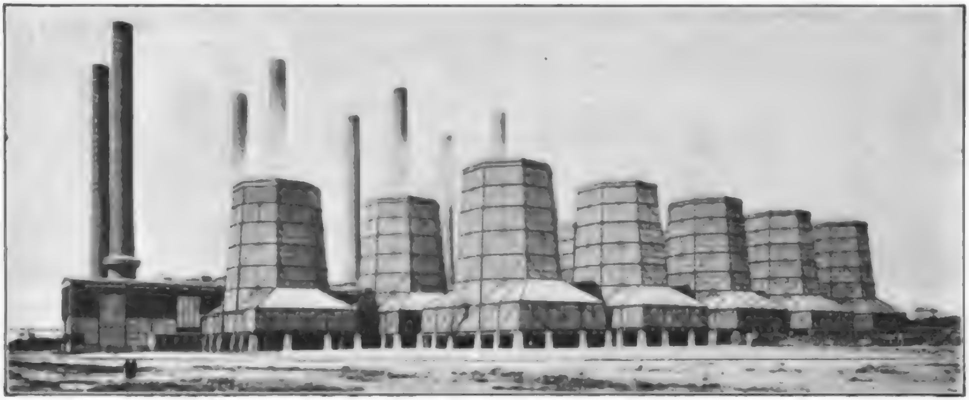


FIG. 13. COOLING TOWERS AT ZSCHORNEWITZ-GOLPA POWER PLANT WITH POWER HOUSE IN BACKGROUND

These towers are 115 ft. high and are eleven in number. In this view the big chimneys, which are 300 ft. high, are somewhat foreshortened. The water for this plant has to be brought five miles and is delivered into reservoirs having a total capacity of 18,000 gallons. It is pumped into Intze tanks built round the chimney stacks 80 ft. above the ground

per cent. Each turbine is connected to two condensers with a total cooling surface of 32,000 sq.ft. The air, condensate and feed-water pumps are driven by auxiliary turbines, which exhaust into the low-pressure stage of the main turbines when the plant is running under full load, otherwise into the air or condenser. Four of the machines also are provided with electric pumps. The condensing plant is housed in the engine-house basement.

Spare engine parts can be run into the engine house in railway trucks and handled by means of two cranes, one of 40 tons capacity and the other of 12½ tons capacity, these cranes being able also to serve the condenser plant through the light shafts in the engine house.

The recooling plant comprises eleven cooling towers 115 ft. in height. The water-softening plant is housed in rooms connecting the boiler houses and also providing accommodation for the feed-water pumps and other appliances, including two compressors for supplying the compressed air required for various purposes in the power house.

Steam is led from the boilers to the turbines through one main over each row of boilers and a third one over the gangway. At the end next the engine house these mains are united to a distributing header which runs the whole length of the engine house and supplies all the turbines. The outside collecting mains of each boiler house are also connected to the central main at the further end, so that, while not directly connected to the battery, the main is able to do its share of the work. To prevent any water getting into the turbines large steam traps are provided at the junction between the collecting and distributing mains, and this arrangement has been successful in preventing any slugging of the engines.

Explosion Prevention in a Bone-Dry Mine Of the Pocahontas Region

By Alphonse S. Brosky*
Pittsburgh, Pa.

In many coal mines one of the big items of cost is the removal of water from the mine. The inflow of water, moreover, adds strangely and unexpectedly to other charges which offhand one would think had no reference to pumping and drainage. Thus, because of the water in some mines the rooms cannot be worked "face on," which usually is the direction most favorable to the obtaining of large coal. The irregularity of the workings where there are both much water and irregular grades reduces extraction and so adds to many charges—tonnage rates, yardage, deadwork, ventilation and haulage among others. The cost of pumping and drainage, however, is enough in itself to raise the cost of operation considerably.

Yet a little water is good for a mine. It reduces the danger from dust explosions, and where a mine is free from water it has to be supplied from the outside, for no fine distinctions exist by which one can differentiate a dry bituminous mine from an unsafe one. Dust must be kept down.

No. 1 mine of the Yukon-Pocahontas Coal Co., at Yukon, W. Va., on the Dry Fork Branch of the Norfolk & Western R. R., has never had a pump underground and, what is more, has never needed one. But it is not a dry mine, for water is continually sprinkled over the roadways. In this mine, water is taken in and none taken out except what is removed in the air currents as moisture. The seam worked is the Beckley, or War Creek, seam, the area being developed covering 4,000 acres. The seam thickness varies from 2½ to 6 ft. Approximately 1,000 tons of coal is loaded out in an eight-hour shift.

Mine explosions are more prevalent in February and March and to a certain extent in January than in any of the other months. During this period of the year the greatest of care is taken at the Yukon mine to guard against explosions. It was in the winter of 1917 that seventeen men were killed in an explosion at the Yukon No. 1 mine, and by the present stringent

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*Bituminous editor, Coal Age.

NO. 1 MINE YUKON-POCAHONTAS COAL CO. AT YUKON, W. VA., IN THE POCAHONTAS REGION

This mine is normally much drier than any other in the vicinity. The coal, as placed in the cars, is dry and dusty and loses little or no weight between mining and marketing. The stream shown is the Dry Fork Branch of the Tug River.

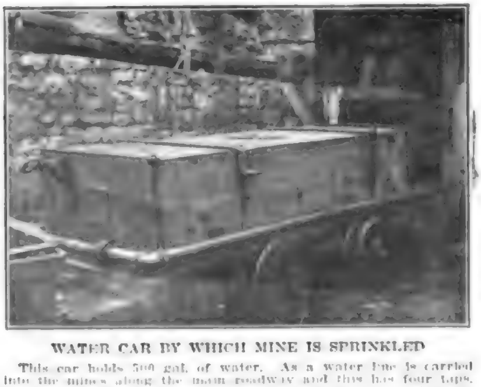
provisions effort is being made to prevent a recurrence of such a disaster. In the summer months the air is warm, but on entering the mines is cooled, so that moisture is deposited on every exposed surface.

So in June, July and August the mine is sprinkled only once a week, whereas during the remaining nine months the roads are wetted down daily. For this sprinkling, in which the whole mine participates, a 500-gal. water car is used.

WATER FROM DRILLED WELL KEEPS MINES WET

Water for this purpose and for use in the town is supplied from a 370-ft. well 6 in. in diameter. It is lifted by a deep-well pump to a 30,000-gal. tank standing 300 ft. above the coal. Several hundred feet from the large tank is a smaller one which holds 12,000 gal. This is fed by gravity from the overflow of the large tank. A water line 3-in. in diameter runs down the main entry for a distance of 7,000 ft. Four taps on this line at regular intervals provide for the filling of the water car, which is pulled along the roadways by an electric locomotive.

The mine is divided into two sections, a quadruple entry dividing the two halves. This entry system has two parallel headings which serve as haulage roadways and two return airways. At five points on the outcrop on the opposite side of the mountain to the main portals, airways which serve as intakes connect the surface with the interior of the mine. As far as possible doors are eliminated. When installed they are replaced by overcasts as early as possible.



WATER CAR BY WHICH MINE IS SPRINKLED

This car holds 500 gal. of water. As a water line is carried into the mines along the main roadway and this has four taps, little time is lost between the water-distributing trips that the car makes.

During the winter and, in case of emergency, during the summer also, the 4½-ft. exhaust fan is driven by a 50-hp. steam engine. In the summer the fan is actuated by an electric motor. Steam is generated the year round in one of two 100-hp. return tubular boilers. In the winter it drives the ventilating fan and is used for heating the mine buildings. In summer the steam is used in the bath house and for driving the fan in emergencies as just stated.

The machine men carry safety lamps. They are instructed to examine the mine face for gas before taking the machine beyond the room neck. Then if they find the place safe they take in the machine and cut it, but if not they notify the mine foreman. Then they test the next place, and if they find it safe go to work there. If the men are allowed to take the machine to the faces before testing for gas they are likely to use it regardless of the indications of gas rather than take the trouble and lose the time involved in taking it out again without cutting the coal.

Permissible powder is used exclusively and is exploded by blasting machines, thus guarding against dust explosions and protecting the men from flying coal. Where blasting fuse is used men are always likely to use short fuse so as to save time, and, moreover, in case of a delayed shot, they are prone to go to the face before it is certain that the fuse is extinguished. The use of the blasting machine prevents these possibilities. Although the mine is a drift and open lights are permitted, it is examined twice daily prior to the entry of the day and night shifts.

THE U. S. BUREAU OF MINES finds that the use of lignite from the Nenana field of Alaska is increasing, particularly because of the improvement in the quality of the lignite being mined. The latest analyses made by the bureau's experiment station at Fairbanks show less than 20 per cent moisture as received and less than 10 per cent ash in dry coal.

TESTS FOR THE CRITICAL TEMPERATURE of Freeport coal in different sizes, made at Pittsburgh, Pa., by the U. S. Bureau of Mines show that the smaller the size the lower is the temperature at which spontaneous heating begins. Experiments are under way to determine the heat conductivity of coal or rate of dissipating heat through a layer of coal. This includes the effect of gas convection and conduction in interstices.

How Locomotives May Be Made to Gather More Cars

Mechanical Means for Handling Coal Have Improved Faster Than Mining Methods—Placing Two to Three Cars at Face for Convenient Simultaneous Loading Is a Step in Right Direction

By F. C. Cornet
New York City

GATHERING locomotives have been used in American coal mines for a number of years. The difficulties under which they are called upon to operate, however, are generally so great that they are unable to do more than a fraction of the work they are capable of performing. This is only one of several instances wherein the mining engineer has lagged behind his mechanical brother. While the latter has produced tools of a highly efficient type, the former has failed to develop mining methods adapted to these new instruments of production.

It seems that, if a gathering locomotive could be made to handle two or three cars at a time in rooms, instead of only one, a step in the right direction would be taken. To make this practicable, some arrangement must be provided whereby two or three empties can be placed together near the face in such a position relative to it as to permit the quick and easy loading of all of them simultaneously. Furthermore, except where the floor of the room is too flat or has inconvenient local dips or basins, the locomotive should not be forced to travel to a face more than once for each set of cars placed there. If the room floor rises, the loaded cars can be dropped to the heading. If it dips, the empties can be run in by gravity, aided or retarded by hand.

Better Track and Cars Needed for This Plan

In order to drop two or three loads at a time safely and quickly the tracks as well as the cars and their brakes must be kept in better condition than they too often are at present. The cars must be oiled more carefully than at present. But this, instead of being an inconvenience of the system of handling the cars by gravity, will of itself result in a notable gain so far as tonnage and cost are concerned, for good tracks, excellent cars, reliable brakes and efficient oiling make for regularity and cheapness of operation as well as for safety.

Of great importance also are the sidetracks or partings where the gathering locomotives pick up the empties and deliver the loads. It seems that such stations ought to be located as near as possible to the main line, taking care not to extend them so far into the working heading that the service afforded the nearest rooms will be hindered. The sidetracks must be so laid that the gathering and main-line locomotives will never get into each other's way. A good layout would be one that would permit the big locomotive to do its work with maximum dispatch without leaving the main line, while similarly the gathering machine must not be forced to operate over the main line in doing any part of its work. In most cases these conditions will be best realized by taking advantage of any natural grades available. But the engineer will be able to lay sidetracks complying with these principles only when no necessity exists for always having the same end of every car turned toward the tipple when going out.

It is difficult to understand why gateless cars and revolving dumps are not more generally used. In providing such cars and dumps many years ago, the mechanical men of the country afforded another example of how they are forging ahead of the mining fraternity on the road of progress. There is no doubt that a gateless car costs less to build than does one that is provided with a gate. Being stronger, it also is less expensive to maintain. It scatters less coal along the road and, consequently, less dust is suspended in the air. This results in greater safety, to say nothing of the saving effected in keeping the tracks clean.

Both Load and Dump Cars from the Side

A revolving dump is less noisy, less brutal in its action on the coal, less destructive to the cars and tipple structure than the kind to which coal operators seem so deeply attached. Doing away with the gates in the mine car removes a nuisance that stands too often in the way of the engineer designing sidetrack layouts or making other plans for developments.

As shown in the accompanying illustrations, in order to place two or three cars at a face in such a position that they can be easily and simultaneously loaded without making the room too wide, it is necessary to abandon the custom of cutting the face at right angles to the ribs of the place. Fig. 1 shows a room 20 ft. wide the face of which is at an angle of 45 deg. with the ribs. This permits the placing of two 10-ft. cars parallel with the face at a short distance therefrom, making it easy to load all the coal produced into one or the other with a single throw. To load coal in this way is certainly quicker and less tiresome than it is with the car in the position in which it is ordinarily placed. With a single car standing on one side of the

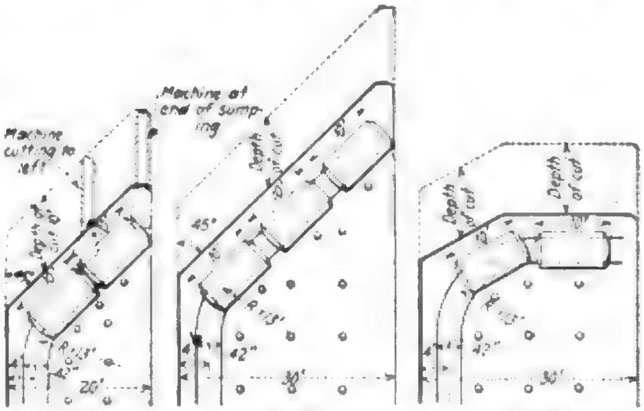


FIG.1 FIG.2 FIG.3

FIGS. 1, 2 AND 3. ROOM FACES FOR LARGE TONNAGE

Big cars and many cars placed at one time are better suited to mechanical haulage than small cars placed one at a time. As shown here they are placed handy to the face, where they are readily loaded without double shoveling.

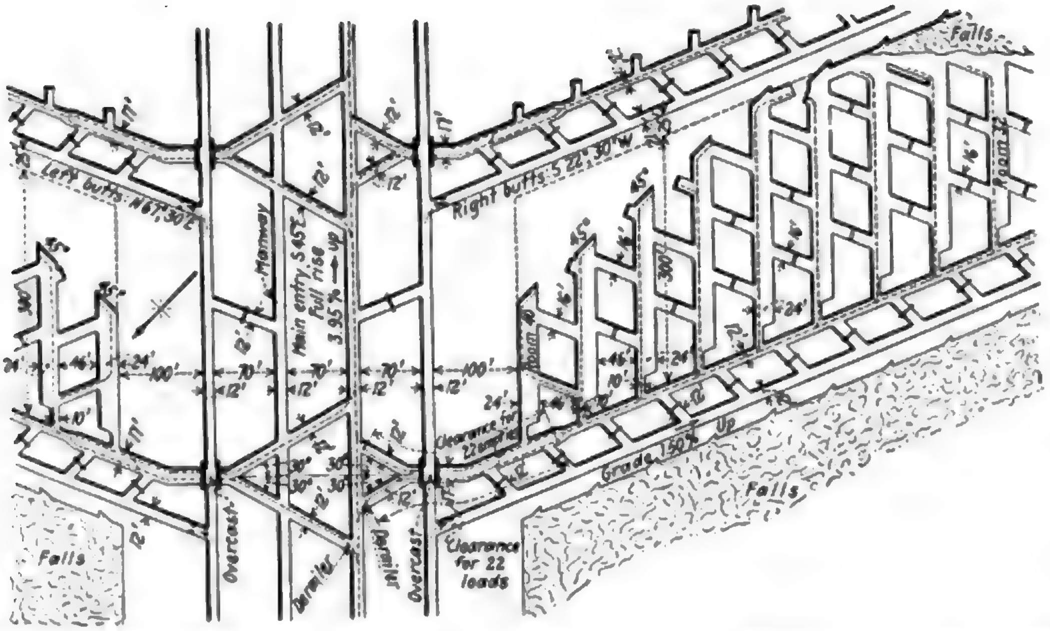


FIG. 4.
Layout for Maximum Gathering Efficiency

The parting where the gathering locomotive places its cars should be just long enough to hold a full trip of empties and should be so placed as not to interfere with main-line haulage. This somewhat unusual layout makes trip making easy and rapid.

room at right angles with the face, much of the coal must be shoveled at least twice.

Fig. 2 shows how, by cutting the face of a 30-ft. room on a 45-deg. angle, three 10-ft. cars can be placed in a position strongly favoring prompt and simultaneous loading without shoveling any of the coal more than once. In a room of such width the old one-car practice would make it necessary to shovel some of the coal three times.

Fig. 3 shows a system followed with much success some years ago by a Cabin Creek (W. Va.) contractor. Thanks to this method, this man was able to nearly double each man's daily loading without any increase in the number of gathering locomotives employed.

Actual practice has proved that it is as easy for the machine men to cut the coal when the face is maintained on a slant as when it is kept square with the ribs. The area swept over by the cutter bar at each operation is the same and the problem of keeping places "on points" is no more difficult in one case than in the other. For best results, the face curve and track must be moved forward daily between the time that the machine men leave the place and the loaders arrive.

This shift can be made in a few minutes by men specially trained for this work. They need not be regular track layers. Two connections only require breaking. The curve and face portion of the track are then moved bodily forward a distance equal to the depth of a machine cut. Finally the curve is reconnected with the outside part of the track by the insertion of a pair of rails of the proper length into the gap left by the forward movement.

Fig. 4 shows how it is proposed to put in practice on a large scale this method of handling two cars at a time in the rooms, combined with a system of side-tracks laid out according to the rules explained above. Two storage-battery locomotives will be employed on each heading during its full production period. Expectations are that 250 cars of 2½ tons capacity will thus be loaded daily from each heading.

The Seven-Hour Day in British Coal Mines

WHAT is the effect of the seven-hour day in the British coal industry, and will the six-hour day, as proposed in the Sankey award, finally come into effect? The answer to the first of these questions is that, from the point of view of the national requirements, the seven-hour day is entirely unsatisfactory, and the answer to the second question is, emphatically, No.

The miners' leaders, however, doggedly maintain that the seven-hour day is working well and with a little more practice and the exercise of a little more skill in the management of the pits the six-hour day will be an economic possibility, but the owners hold that though they appreciate the increased effort shown by the men under the present system, the seven-hour day will not allow the war-time wastage to be made up, that the actual time spent at the face does not amount to more than six hours and forty minutes at the most, and that the sooner the eight-hour day is restored the better it will be for everybody.

In the light of experience it is now seen that the concession of a shorter working day to the miners during the initial stages of national reconstruction was one that the industry could not afford. It was a mistake for which the industry, and incidentally the miners, have paid since. It is undoubtedly true that individual output has substantially increased during recent months, but the fact remains that it is below the minimum necessary to make good the wastage caused by the war and to restore prosperity to the industry. This can be attained only by the requisite amount of effort, plus the extension of working hours from seven to eight.

Production costs are still too high. These, it is estimated, can be reduced by 2s. 6d. or 3s. by a reversion to the former system and the resultant saving would enable the colliery companies to sell fuel at a much lower figure to industrial consumers—a boon that probably would do much to revive trade.

There is another aspect to the hours question which merits careful consideration. The attempt to obtain a maximum output in seven hours tends in some cases to lead to hurry and confusion, which are calculated to have a prejudicial effect on the safe working of the mines. There is a distinct possibility of an increase in the number of accidents under some methods of "speeding up," to say nothing of a dissipation of effective effort. Steady, hard work spread over a working day of eight hours would, it is calculated, give the best results.

E. A. Mitchell-Innes, chairman of the Consolidated Cambrian, Ltd., one of the largest concerns in Britain, has drawn attention to the loss of output which is being caused by the curtailment of working hours in the mining industry.

No useful purpose is served by shutting one's eyes to economic truths, however unacceptable they may be. The miners much need to be informed of the disastrous effects that the seven-hour day has on the coal trade.

While admitting that the miners are now working well and with a good spirit, Mr. Mitchell-Innes made it clear that the statutory reduction in the number of working hours has saddled the industry with a burden beyond its capacity to bear. He shares with other authorities the view that the shortened day is one of the principal factors militating against the recovery of the trade.

In recommending the adoption of a seven-hour day Justice Sankey, in his report, assumed a temporary loss of output which would be made good after a lapse of about two years. His prediction has been entirely falsified. According to Mr. Mitchell-Innes, the loss in tonnage raised to the pithead is approximately one-fifth—a substantially greater proportion than was estimated by the advocates of the shorter working day; and there has, of course, been a corresponding increase in costs of production. It is estimated that the cost of industrial fuel could be reduced by nearly 3s. per ton by a return to the eight-hour day, and this in itself would give a much-needed fillip to trade.

A reversion to the former system, however, for obvious reasons, can be effected only by agreement. It is necessary to emphasize this to dispel any suspicions that the mine owners contemplate a policy of coercion to obtain the longer working day. Such a policy would defeat its own object. The co-operation and good will of the men are indispensable if the extra hour is to be obtained, and there is little doubt that these would be forthcoming from the majority of the men if the matter were thoroughly explained to them. The men, as parties directly concerned in colliery profits and losses, stand to benefit eventually to a considerable extent by the reduced production costs and the larger volume of trade that increased output would entail. It is, therefore, in their own interest to consider the question dispassionately and without prejudice before declaring against it.

Danger That Men Would Be Caged Too Rapidly

In making his interim report, Justice Sankey, as chairman of the Coal Industry Commission stated that the question of reducing the hours of colliery workers was a serious and difficult one—serious because it must admittedly reduce output, difficult because it is a matter almost of impossibility to estimate in what degree it would be reduced.

"It would be in our view," says he, "too dangerous an experiment in these circumstances to recommend a two-hour reduction at once, and we have had great difficulty in coming to the conclusion whether it is better to recommend at once an eight-hour act as originally intended, or the substitution, first, of seven hours and later of six hours for eight. We have come to the conclusion that the latter is the better course because it will not tempt persons to put men down and bring them up too rapidly—a system which might lead to more accidents. The reason for recommending a further reduction in July, 1921, is that we think we are justified in assuming that in two years the output should have reached by the united efforts of all concerned the amount of coal raised in 1913—namely, 287,000,000 tons."

Justice Sankey further said that the Seven-Hour Act will mean that the men will be underground an average of seven hours and thirty-nine minutes, according to the evidence of Sir Richard Redmayne, chief inspector of mines, and that the estimated decrease in output per annum will be "a little under 10 per cent." It is interesting to note that Justice Sankey estimated that to meet the decreased hours mentioned, the sum of £13,000,000 would be required in 1919.

Hoped That His Arithmetic Would Be Belied

In the interim report, Robert Smillie and other representatives of the miners stated that "Sir Richard Redmayne refused to accept the view that a reduction of output is necessarily in arithmetical proportion to a reduction in working time, and has told us that whereas he estimates the reduction of the effective working time at the face through the proposed alteration of hours as 24.3 per cent, the immediate reduction in output would not, in his opinion, be more than 19 per cent. It should be observed that Sir Richard Redmayne refers here to the *immediate* result of a reduction, without taking account of any one of numerous factors that he mentioned to us, each of which (even irrespective of the economies of unification, discussed later) would certainly produce an increased output, many of which could be brought into play within a very short period."

The ten factors are then mentioned in this report and later on the miners' representatives state: "Our view is that, taking all things into account, output will show at first a certain fall per hewer, and will then, with the introduction of improved methods, recover to a certain extent, to which recovery no definite figure can be assigned." And again they state: "Moreover, even to the extent that the average output per workman falls, we do not anticipate, on the resumption of business by the industrial world, that there will be, in fact, any reduction in the aggregate coal output of this country."

The seven-hour day came into operation on July 16, 1919. In his final report, dated June 20, 1919, Justice Sankey, in Recommendation No. 5, stated: "I make this report because I believe that the workers at present employed can and will maintain an output of 250,000,000 tons a year at least, which was the figure adopted in the interim report of March 20 last, presented by me and my three colleagues. I rely upon the men's leaders and on the men and on all others concerned to achieve this result. In my opinion it can and ought to be attained. If the output per man continues to go down, the supremacy of this country is in danger."

It is interesting to note that although Justice Sankey mentions the figure of 250,000,000 tons as the probable output for 1919, Frank Hodges, in his book, "Nationalization of the Mines," gives the actual tonnage raised for that year as 229,200,000, or an average output per person employed of 223 tons. As regards individual output, this probably is an overstatement, because Professor Henry Louis mentions the figure as 192.9 tons. These two authorities differ only regarding the total number of persons employed in and about the mines that year. Frank Hodges states the number as 1,029,604, and Professor Louis gives 1,191,313. They agree, however, as to the total tonnage raised. Professor Louis' significant figures are given in Table 1.

TABLE I. COMPARISON OF OUTPUTS PER PERSON, 1920 AND 1921

	Persons Employed	Total Tonnage	Output per Person
1920	1,248,224	229,435,503	183.9 tons
1921	1,213,700	215,132,000	177.2 tons

Professor Louis gives statistics from the year 1900 onward and then comments as follows:

"The most obvious feature is the steady fall in the producing capacity of the men engaged in the industry. . . . . The first noteworthy fact is that the productive efficiency started to decline long before the war and though it has greatly accelerated since the war ended, the cause must evidently be sought further back. On July 1, 1909, the Eight-Hour Act of 1908 came into force, and from that time onward lowered output is to be noted.

"In July, 1919, the hours were further shortened to seven, and a corresponding falling off in output is to be noticed. The marked falling off in production per worker with each reduction in the hours of labor speaks strongly in favor of Lord Weir's proposal for restoring the eight-hour system, at any rate until the industry is once again on firm ground.

"I would, therefore, suggest that his proposal is defective in so far as it proposes to treat all classes of collieries with the same lack of discrimination as was evidenced in the 1919 Act. For example, it may fairly be claimed that a man who has put in a seven-hour shift hewing in a narrow seam of hard Northumberland steam coal has done as much as can be expected of him and has fairly earned his day's wage; he has probably taken more out of himself than would a man running a coal cutter in a fine thick level seam, such as is found in Yorshire and the Midlands, even if the latter worked a ten-hour shift.

"My suggestion would be that the seven hours should remain in force for collieries and districts where coal is hewed by hand and that the eight-hour system be re-established for all places where coal is cut by machine. Such a modification would not only equalize the demands on the men but would be an incentive to introduce coal-cutting machinery as extensively as possible."

The prospect for the immediate future is that the owners will endeavor to get the miners to agree to a return to the eight-hour day, and probably will undertake an educational campaign to attain that end.

British Mines Consume Seven Per Cent Of All the Coal They Produce

EIGHTEEN million tons of coal are consumed under the boilers of the collieries of Great Britain. This is 7 per cent of the total coal produced. In a detailed investigation of twenty-four collieries in various parts of the country, instituted by the Board of Trade Coal Mines Department, says D. L. Selby-Bigge in *The Iron and Coal Trade Review* of London, England, it was found that the consumption of coal varied from 4.5 to 16.5 per cent of the total production, showing that a wide variation exists in the economy by various plants (*sic*). It is well known that, though in certain districts—notably South Wales—special attention has been paid to economy in the use of coal, at a large proportion of the three thousand and more collieries in the country, little or no attention has been given to the matter.

Why Adopt Half-Way Measures in Safety?[*]

By L. C. Illsley[†]
Pittsburgh, Pa.

IN MANY ways evidence has come to the Bureau of Mines that coal-mine operators are deceiving themselves or are being deceived by overzealous salesmen as to what constitutes a proper protection for the electrical equipment in use at gaseous mines or in gaseous sections of a mine.

The Electric Power Club gives the following definitions of expressions used in regard to electrical equipment:

Acid-Resisting Apparatus—Equipment so constructed that acid fumes will not readily injure it.

Drip-Proof Apparatus—Equipment so protected as to exclude falling moisture or dirt. If it is provided with suitable protection integral with the apparatus it may be either open or semi-enclosed or it may be so enclosed as to exclude effectively falling solid or liquid material.

Dustproof Apparatus—Equipment so constructed or protected that the accumulation of dust will not interfere with its successful operation.

Dust-Tight Apparatus—Equipment so constructed that dust will not enter the enclosing case.

Explosion-Proof Apparatus—Equipment so constructed that the enclosing case can withstand, without injury, any explosion of gas that may occur within it, and will not transmit the flame to any inflammable gas outside it.

Gas-Tight Apparatus—Equipment so enclosed as to exclude the surrounding atmosphere.

Moisture-Resisting Apparatus—Equipment in which all parts are treated with moisture-resisting materials. Such apparatus shall be capable of operating continuously or intermittently in a very humid atmosphere, such as mines, evaporating rooms, etc.

Splashproof Apparatus—Equipment protected against the entrance of a spray of water from any direction.

Submersible Apparatus—Equipment so constructed as to be capable of withstanding complete submersion in water for four hours without injury.

Weatherproof Apparatus—Equipment so constructed or protected that exposure to the weather will not injure it.

GAS-TIGHT APPARATUS NOT APPROVED BY BUREAU

The Bureau of Mines recommends for use in gaseous mines or gaseous sections of a mine only such apparatus detailed in the Electric Power Club list as "explosion-proof" equipment.

Dust-tight, gas-tight and submersible apparatus might answer the purpose if one could be sure that they would always be kept in a gas-tight condition, but, owing to rough handling, careless assembling, omission of bolts, etc., this is not a safe assumption to make, and sooner or later gas will get into the interior of the equipment. When inside the compartment the gas can be exploded by an electric spark or arc and as the casings have not been designed for this contingency, they will not usually withstand the pressure developed by the internal explosion.

Returning now to the consideration of explosion-proof designs, according to the definition such compartments must have enclosures that can withstand "without injury, any explosion of gas that may occur within it, and will not transmit the flame to any inflammable gas outside it."

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[*] Published by permission of the Director of the Bureau of Mines.

[†] Electrical engineer, U. S. Bureau of Mines.

How can the manufacturer, the state inspector or anyone else be sure that a given compartment meets this requirement? Is it something that can be determined by visual inspection? Tests of equipment submitted to the Bureau from time to time have proved that the only safe way to determine this point is to subject every different design to an actual test in gas.

The Bureau of Mines' method of testing is to fill a large chamber with Pittsburgh natural gas and air mixed in proportions that will give a very explosive mixture. Some of this mixture is drawn into the interior of the apparatus under test, completely filling the interior space with the gas and air, the apparatus being entirely surrounded with the same explosive mixture. The apparatus is then closed and the interior mixture exploded, careful note being taken of what happens—i.e., whether smoke, sparks or flames issue from the joints or other openings. A record is taken also of the internal pressure developed.

Must Be No Explosion or Visible Flame

If flames are noted, even though they do not ignite the surrounding gas, or if the pressure developed by the explosion is excessive, the apparatus does not pass the tests. In addition to the testing just mentioned, careful inspection is given to the wiring, to the fastening of bolts, to the opening around the bearings, to insulation, to clearance of electrical parts, to bolt holes (no through holes are permitted through the casing) and to any other feature that it is believed affects the safety of the unit as a whole.

The Bureau of Mines' approval plate on apparatus is a guarantee to the operator that this line of apparatus has received such test and inspection, and that every endeavor has been made to insure especial attention while the equipment is going through the factory, by working out with the manufacturer special inspection sheets to be used at the factory in connection with each permissible machine.

Three classes of electrically operated coal-cutting equipment are on the market today:

(1) The wide-open type with no pretense to safety, designed for use in non-gaseous mines.

(2) The so-called "flame-proof" type, which has not been tested or approved by the bureau and in many cases the manufacturer has not put it under test.

(3) The "permissible" type having the Bureau of Mines' approval plate.

The cost of the third class as compared with the second class is about 5 per cent greater, due, it is understood, to more exact inspection at the factory and to the addition of certain safety features required by the bureau. The bureau believes that those purchasers who have the difference between the two designs explained will not hesitate to pay the 5 per cent excess for the greater protection.

The salesman who through ignorance or for competitive reasons tries to sell for use in gaseous mines a so-called flame-proof equipment that has not been thoroughly tested in gas and received a rigid factory inspection is doing his firm as well as his prospective customer an injustice, and the customer who purchases such an equipment is paying for a supposed safety that probably does not exist.

Another menace to safety results from the tendency to "patch up" open-type equipment to "get by" the state inspector. This is a practice that every state inspector should discourage. He should accept nothing as safe unless it has been tested. Visible inspection is not sufficient.

Let us be honest with ourselves and our workmen. In open-light districts, where no protection is needed, there is no objection to open-type equipment; but in closed-light districts use equipment that has been subjected to rigid tests and inspection with this class of service in view. Why be satisfied with halfway measures where safety is concerned?

The following companies have several types of approved coal-cutting equipment: Goodman Manufacturing Co., Chicago, Ill.; Jeffrey Manufacturing Co., Columbus, Ohio, and the Sulivan Machinery Co., Clairmont, N. H. The following companies have approved storage-battery locomotives: Jeffrey Manufacturing Co., Columbus, Ohio; George D. Whitcomb Co., Rochelle, Ill. Several other companies have applications on file and apparatus partly tested.

Fife Field the Most Important in Scotland

EXTENDING over an area only eight miles broad and about thirty-six miles long which runs parallel to the northern shore of the Firth of Forth, the Fife coal field is the premier field of Scotland, says *The Colliery Guardian*. The field occupies three-fifths of the total area of the county. On the north the Old Red Sandstone crops and there is irregular faulting of the measures. On the west the coal field adjoins that in County Clackmannan. On the south the coals dip under the Firth of Forth and on the east the North Sea coast line from Fife Ness to St. Andrews forms the boundary. The productive area does not exceed 150 square miles [barely a third of that of the anthracite regions of Pennsylvania].

All classes of coal are produced from the three groups of coal measures into which the field is divided, but steam and navigation coals predominate. At Roseband coking coals were at one time produced and at Ballingry gas coal was mined so long as a demand existed. Anthracite occurs in the deeper shafts, and in the shallow areas, where molten matter has intruded, low-volatile coals [known as "navigation coals" in Great Britain] are obtained. Such places are Kelty, Torryburn, Lochgelly and Bowhill.

Few dykes are found in the coal-bearing strata, but in the central and western portion of the Carboniferous Limestone series thick beds of whin running transversely are often found. These beds of whin vary from a few feet to about 420 ft. in thickness. In most cases they run parallel to the stratification, but often they cut up at a flat angle to the seams and in consequence destroy large areas of coal. Fires from spontaneous combustion occur in the upper part of the Lochgelly splint seam, especially where the two parts of the double seam are close together. Often they are separated by several fathoms of rock. These ignitions occur only when the coal has been worked for some time.

Three serious outbursts of gas have occurred in recent years in the Five-Foot seam of the Carboniferous Limestone. Of these one was at Valley Field Colliery and the other two at Glencraig. In the former three men were suffocated when an outburst of gas occurred which displaced 190 tons of coal.

Problems of Operating Men

Edited by
James T. Beard

Haulage Arrangements in Pitching Seams

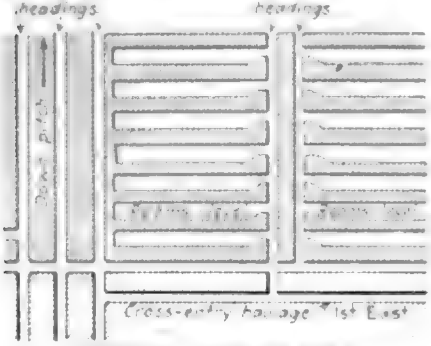
Main Slope Driven on the Full Dip of the Seam—Locomotive Haulage Employed on Cross-entry Levels—Butt Headings Driven to the Dip and Coal Hoisted to the Levels from Rooms Turned on the Strike

RECENTLY I received a letter from an Alabama coal operator, commenting on an article of mine published in *Coal Age*, Mar. 16, p. 439, which described the use of chain machines for cutting the coal on a pitch of 20 or 21 deg. The correspondent writes as follows:

> My company operates a mine in which the pitch of the coal is the same as that mentioned in your article, in *Coal Age*. For some time past, it has been our desire to use chain machines in this mine; but, owing to the unsatisfactory reports of the experience of others, in operating machines under these conditions, we have never attempted their use in our own mine.
>
> These reports come chiefly from mines worked on the ordinary room-and-pillar system, cross-entries being driven on the strike of the seam and the rooms turned directly up the pitch, or at a greater or less angle with the entry.
>
> After studying your article closely, I am of the opinion that a system such as you describe can be employed in working our coal, which is from 4½ to 5 ft. thick. The only question in my mind is how to provide a satisfactory method of landing the coal on the cross-entries, after hoisting it from the rooms on the butt slopes. So far I have been unable to work out a scheme for that purpose and I am writing to ask if you can give me the details of the trackage layout that you used at the head of the butt slopes.

Believing that this may be of interest to readers of *Coal Age*, I am sending a copy of the sketch made in replying to this correspondent, together with the following brief description of the method employed. As has been stated, the pitch of the seam varies from 20 to 21 deg.

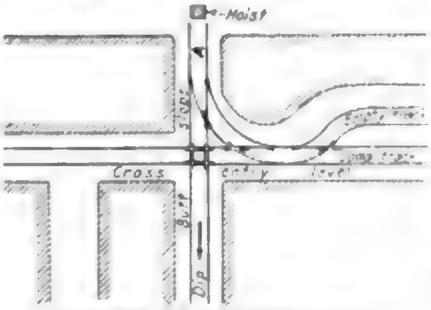
The general method of working is shown in Fig. 1. The main haulage slope and air-courses are driven three abreast, straight down the pitch or dip of the seam. Cross-entry levels are then turned to the right and left of the main slope headings. These levels have a slight grade in favor of the loads, and locomotives are used to haul the coal on them.



GENERAL PLAN OF MINE

As shown in this plan, butt headings are driven at right angles to the cross-entries, on the full dip of the seam or parallel to the main slope headings and rooms turned to the right and left of these, on the strike of the seam.

As shown in Fig. 2, a small hoist is installed at the head of each pair of butt headings, above the cross-entry level. By this means, the coal gathered from the rooms is hoisted up the slope to a point above the switch *A* and then dropped back through this switch on to the loaded track on the cross-level.



MANNER OF HOISTING COAL ON BUTTS

In the operation of this system, a locomotive pulls a trip of empty cars, from the main slope, into the mine and, leaving them on the empty track, passes through the switch onto the loaded track, where it then proceeds to push a loaded trip out to the slope by which the trip is hoisted out of the mine.

The plan is very simple and has been found to expedite the haulage of coal, in seams of moderate pitch, and, incidentally, to lessen the cost of production, which is the important factor in the mining of coal today.

Denver, Colo. **CHARLES M. SCHLOSS.**

Compressed Air in Mining

Entry ventilated by the compressed air operating the machines—Failure to open valve in air pipe causes trouble—Gas accumulating is removed with difficulty.

REFERRING to the question of ventilating a heading with the compressed air used to operate machines, as asked by an inquirer in *Coal Age*, Mar. 2, p. 374, I am pleased to endorse the reply given to this inquiry, stating that no danger is to be feared in the use of such air for ventilation.

Some years ago, I was assistant night foreman at the Wallsend Colliery, County of Northumberland, England. At that mine, a Stanley header was used in driving one or more of the headings. The machine was operated by compressed air.

How far the heading had been driven ahead of the last crosscut I am unable to say, but it was a long distance. The heading was ventilated wholly by the air exhausted from the machine. When that was running the exhaust of the engine furnished ample ventilation in the heading.

At intervals of 20 or 30 ft., air valves were provided in the pipe line to afford a supply of air when the engine was not in operation. It was only necessary, then, to open the last valve in the pipe line, which was the one nearest to the face of the heading, and that supplied sufficient air to keep the place clear of gas and make it safe for work. All the other valves were kept closed.

The men working in this entry never experienced any ill effects from the air, which was generally regarded as giving good ventilation. As the editor has stated, in his reply to the inquiry, the use of compressed air is only harmful when the men are compelled to work in a caisson under an increased pressure.

DIFFICULT TO CLEAR HEADING OF GAS ACCUMULATED AT NIGHT

One night, the men operating the machine previously mentioned failed to open the air valve, on leaving the mine. Accordingly, a large amount of gas accumulated in the heading. On entering the place that night to make my customary examination, I was able to proceed but a short distance, on account of the accumualted gas that filled the entry.

It was with difficulty that I at last succeeded in clearing the heading of gas and reaching the face. Fortunately, I had no one working on the return air. Only a few repairmen were in the mine, and I warned them to keep out of the return airway, telling them of the condition I had found in the heading.

Taking one practical man with me, I proceeded to the heading and opened a valve in the air pipe, at the farthest point inby we could reach. The air escaping from this valve cleared the gas so as to enable us to reach the next valve on the pipe line. Opening that valve and closing the preceding one partially, we again waited for the gas to clear.

In a short time, we were able to reach and open a third valve. The first valve was then closed tight and the second valve partially. By proceeding in this manner, opening and closing the valves, in turn, as we advanced, the face of the heading was finally reached. Then all the valves were closed, except the one at the face, which I left wide open to keep the heading clear of gas.

WILLIAM DICKINSON.

Lochgelly, W. Va.

OTHER LETTERS

IN READING the inquiry of Anton Franke, *Coal Age*, Mar. 2, p. 374, regarding ventilating a heading by the air exhausted from the machines used to drive the entry, I am reminded of an instance that occurred several years age, in a mine where I was employed at the time.

The condition was similar to that described in this inquiry. The heading had been driven through a fault, several hundred feet ahead of the air. To avoid the expense of double entry, the heading was driven single and ventilated by the exhaust air of the engine driving the header.

CARE REQUIRED TO AVOID POSSIBLE OVERHEATING OF AIR PIPE

Through some lack of attention or failure to provide for such an occurrence, the compressed-air system had become very hot, with the result that carbon monoxide was generated in the pipe line and discharged from the engine in operation.

The result of breathing this poisonous gas, even though but a small percentage of the gas was present, was quickly shown by its effect on the men. In one instance, the result was fatal. Following this accident, a close guard was kept on the operation and the men were promptly withdrawn on the first intimation of danger.

Johnstown, Pa. FRED NICHOLS.

MY EXPERIENCE in the use of compressed air, for the ventilation of a place driven ahead of the air, leads me to say that there is nothing to fear in this practice, provided the pipe line is equipped with a valve, and this is opened enough to allow the escaping air to keep the place clear of gas.

It was always our practice to open this valve slightly, for a time, both before and after firing a shot, in order to make sure that no gas was lodged at the face and to help clear away the smoke produced in firing. Observation shows that there is not a perfect distribution of the air escaping from the pipe line, and caution is needed in this regard to insure the clearing away of the gas at the roof.

Standing back a short distance before the smoke has cleared from the face of a heading where a shot has been fired, one can observe the stratum of clear air settling at the floor while the smoke and other gases hang in the roof. The reason is that the escaping air is cooled by expansion and, being lighter than the hot air and gases produced by the shot, sinks to the floor.

INGENIOUS USE OF AN INJECTOR

An air box was made of a certain length and laid close to the rib along the floor, at the face of the heading. The air pipe was then led into this box and, by placing an injector on the end of the pipe, its action was to draw the air from the floor, after the manner of an injector used for pumping water, with which all mining men are familiar.

The scheme proved satisfactory in giving a better distribution of the air at the face of the heading. The only objection was the noise made by the injector.

In some instances, it happened that the air supplied by the exhaust from the machine was not sufficient for the safe ventilation of the heading. In that case, it was customary to run an air box from the main entry and carry it along one side of the road to the face of a heading driven single. The air box saved the expense of building an entire brattico on one side of the road, after the usual manner of ventilating a close place.

GASTON F. LIBIEZ.

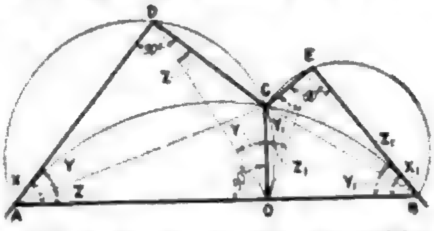
Peru, Ill.

Problem in Geometry

Applying two principles, which are alike properties of the circle—Angle between chord and tangent measured by half the subtended arc—All inscribed angles subtended by the same chord of a circle are equal.

IF NOT too late, kindly allow me to offer another solution of the "Problem in Geometry," *Coal Age*, Mar. 23, p. 493, which may shorten the solution already given.

Referring to the accompanying figure, AD and BE are tangents to the circle ACB, at the two respective extremities of the chord AB, and OC is an ordinate at any point O of that chord. From the extremity of this ordinate, CD and CE are drawn respectively perpendicular to the tangents AD and BE. It is required to prove that the ordinate OC is a mean proportional between these two perpendiculars. In other words, what is desired is to prove the proportion



$$CD : OC :: OC : CE$$

Applying the principle that the angle between a chord and the tangent at either extremity of such chord is measured by half the subtended arc, it has been shown that the angles X and X_1 are equal, being each measured by half the arc ACB. By applying the same principle, the angles Y and Y_1, and the angles Z and Z_1, at the two extremities of the chord AB, have been shown to be equal, each to each.

Now, on AC as a diameter, describe the arc of a circle $ADCO$. The points D and O will lie in the circumference of this circle, the angles ADC and AOC being right-angles and since all angles inscribed in a semicircle are right angles. Likewise on BC describe the arc of a circle $BECO$. Here, again, the points E and O will fall in the circumference of this circle, for the reason just given.

Now, applying the principle, which is a property of the circle, that all inscribed angles subtending the same chord are equal, we find the angle Z at the point A is equal to the angle Z at the point D, each being inscribed in the circle $ADCO$ and subtending the same chord OC. Likewise, in the circle $BECO$, the angle Z_1 at B and the angle Z_1 at O are equal, being inscribed in this circle and subtending the same chord CE.

Again, applying the same principle, we find the angle Y at A equal to the angle Y at O, being inscribed in the circle $ADCO$ and subtending the same chord CD. Also, the angle Y_1 at B is equal to Y_1 at E, being inscribed in the circle $BECO$ and subtending the same chord OC.

Finally, the angles X, Y, Z at A, having been shown equal to the angles X_1, Y_1 and Z_1 at B, respectively, the angles Y and Z in the triangle OCD are equal to the respective angles Y_1 and Z_1 in the triangle OCE. Therefore, these two triangles have all their angles equal, each to each, and are similar, and their corresponding sides proportional, giving the proportion

$$CD : OC :: OC : CE$$

which was to be proved.

Fitting for Responsible Positions

Education and training often fail of practical results — The successful foreman a good mixer with his men —Personal appearance an indication of one's ability.

IN SOME of the recent letters that have appeared in *Coal Age*, writers have referred to the difficulty of securing a responsible position, after qualifying themselves and training for the place. The claim has even been made that men who can tell "funny stories" are often chosen to take charge of a mine in preference to one who has far more technical education and training for the position.

Personally, I cannot believe for a moment that mine managers and superintendents are turning down educated and experienced men who apply to them for responsible positions and choosing, instead, men whose chief qualifications consist in their ability to talk and tell stories. Mine officials are looking, today, for men who can produce results in the showing in the cost-sheet.

I do not wish to be understood as de-crying education and training; but it must be acknowledged that there are men who are possessed with these qualities and yet cannot successfully run a coal mine. Again, there are men who are unable to figure the different problems in ventilation, but who know how to produce air in a mine.

DIFFERENT KINDS OF MINE FOREMEN

There are foremen who cannot calculate the number of tons in an acre of coal land, but are able to compete with the best mine foremen to be found, in putting cheap coal on the tipple. In contrast with these, there are men expert in the calculation of ventilating problems and who can figure correctly the tonnage of coal, per foot-acre, in a property, but who are complete failures as far as cheap coal and good ventilation in a mine are concerned.

Let me ask some of our writers, Which of these men they prefer to put in charge of a mine? To be able to tell a good story and, even to speak a kind word to a drunkard and gambler, does not, in my opinion, disqualify a man for successful foremanship.

No one will claim that a coal mine can be operated successfully by a man whose chief qualification is story-telling. However, a good story from a foreman is not amiss, at times, and may produce results. The successful foreman is a good mixer with his men. His treatment of them is fair, but kind and firm. The cussing methods of the old-time boss have passed. They do not avail in the mines today.

Some men have the ability to make a favorable impression, at first sight, when applying for a place. Others, with a better education and a wider experience, make but a poor impression. Often a man's personal appearance goes a long ways in producing a favorable impression on the mind of another.

Let me say here that a man may have his pockets full of certificates and recommendations, but the man to whom he applies for a position will depend more on what he sees in the fellow's face and his general appearance.

Dayton, Tenn. JOHN ROSE.

Inquiries Of General Interest

Effect of Rise and Fall of Barometer on the Escape of Gas in Mines

Barometric Pressure True Index of Atmospheric Pressure —Other Pressures Affect Outflow of Gas Into the Mine—Effect of Internal Pressure on Occluded Gas

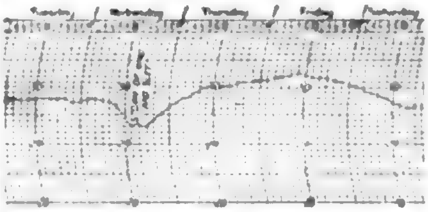
IN order to understand thoroughly the use of the barometer, in the examination of a mine for gas by the fireboss, I asked a mine foreman some time ago for a few pointers on the subject. In reply, he told me that he had firebossed in some very gassy mines and had always found more gas when the barometer was low. He said this was particularly so in pillar workings. He had not the same fear and anxiety when the barometer was high as when it was low.

More recently, however, I was talking with another foreman who appeared to have little faith in the indications of the barometer, as far as its changes affected the gas in the mine. He stated that the barometer did not indicate any change, until it was too late to be of any use in foretelling conditions in the mine. His idea was that a fall of atmospheric pressure that would increase the outflow of gas in a mine would not be indicated on the barometer till about three hours later.

After this talk, I was all at sea again in regard to the use that a fireboss could make of the barometer. I studied over the matter and was more puzzled than ever. I am preparing for the next examination and, as I do not wish to misunderstand the relation of the barometer to the work of the fireboss and his duties in the mine, I am asking for the opinion of *Coal Age* in this regard.

Burgettstown, Pa. PUZZLED.

It has shown, beyond a doubt, that a fireboss finds more gas on entering a mine when the barometer is falling, than during a rise of the barometer.



BAROMETRIC CHART DURING A STORM

Many have been led to suppose that a fall of atmospheric pressure, as indicated by a falling barometer, is accompanied with a greater emission of gas from the coal. This, however, seems quite improbable when it is considered how slight the fall of pressure is, compared with the much greater pressures under which occluded gas exists.

On the other hand, there is no question but that bodies of gas, accumulated in pockets and crevices in the strata and in the abandoned workings of a mine, expand under the lesser pressure of the atmosphere when the barometer falls. As a result of this expansion, gas flows out from such places into the live workings of the mine.

Now, in respect to the tardiness observed in the action of the barometer, it is quite true that the mercurial barometer does not respond to a change in atmospheric pressure as quickly as such change affects bodies of gas accumulated in the mine. All mercurial barometers are not alike responsive to changes in pressure. Frequently, these changes may only be observed from one to three hours later, depending on how closely the instrument is observed.

In this connection, also, attention should be drawn to the fact that the mercury column may fall slowly for a number of hours before the change is detected. This is not true in the use of the barograph, which is a recording instrument that shows by a continuous line drawn on a chart how the pressure is changing. Such a chart is shown in the accompanying figure.

The rise and fall of the pressure line between the hours of 2 and 6 p.m., Wednesday, as shown on this chart, would not be observed at all, if indeed they affected the mercury column owing to its inertia. The advantage of the barograph is that the chart shows at a glance whether the barometer is rising or falling, which can only be detected by several readings of the mercurial barometer. Again, the barograph is actuated by an aneroid barometer, which is almost as sensitive to changes of pressure as the gas itself.

Speaking of the emission of gas from the strata in mines, it should not be thought improbable, but rather extremely possible that the internal pressures within the earth, which give rise to volcanic eruption and subterranean disturbances, affect, to a degree, the gases of the coal formations and this effect is manifested, from time to time, in the gaseous condition of mines.

Action of Carbide Flame in Gas

Peculiar action of lamp flame in gas observed—Explanation asked.

ONLY recently, I observed what seemed to be a very peculiar action of the flame of a carbide lamp. When the lamp was held at a point about 2 ft. above the gangway level, and in such a position that the flame of the lamp was upright, it appeared that the flame ceased to burn, for a distance of from 1 to 1½ in. above the tip of the burner. At the same time a small flame ½ in. in height was observed burning above this distance. The thing seemed so queer and weird that I decided to write and ask if any of the readers of *Coal Age* have observed a similar appearance.

It was thought by myself and those who saw the phenomenon that it was caused by gas being present in the place. I would like to ask if pure methane has ever been found in rise workings. **Joseph Lawrence.**

Hazleton, Pa.

From the reading of this inquiry, it would seem that the lamp was held in a hole excavated to a height of 2 ft. above the gangway level. That being the case, there is no doubt but that the observed action of the flame of the lamp was due to the presence of gas in the hole.

While it is a wonder that the incident did not result in the severe burning of the person holding the lamp, it is probable that the air passing the place sufficiently diluted the gas coming from the hole to bring the mixture just below the inflammable point, or the point where inflammation would take place throughout the entire body of the gas.

In experimenting with the formation of flame caps in safety lamps, the writer has often observed the phenomenon described by this correspondent. In these experiments, a common Davy lamp was inserted in a box through which was passing a current of gas-charged air. It was possible to so regulate the flow of air and gas as to produce flame caps of varying height, followed by the flaming of the lamp and slight explosions within the gauze chimney.

At one stage of the process the flame would be observed to leave the lampwick and mount above it a distance of about 1 or 1½ in. where it would continue to burn. On again slowly reducing the percentage of gas in the mixture, the flame would drop down and ignite the wick. We assume that this was the condition probably attained at the point where the carbide lamp was held; but we would not advise repeating such an experiment.

Replying to the correspondent's last question, it can be stated that there are many instances where marsh gas is found accumulated in pockets, although pure methane is rarely found in mines, the gas being generally associated with other hydrocarbon gases and, at times, mixed with carbon dioxide and air.

Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

Question — *How much work, in horsepower, is done in raising 400 tons of coal up an incline having an inclination of one in three, when the friction of the cars adds 40 per cent to the load?*

Answer — This is a poorly worded question. First, the amount of work performed will depend on the length of the incline, which is not stated. Again, the horsepower required for any work will depend on the time in which the work is performed, which is not stated in the question.

However, assuming the rise is 1 ft. in 3 ft. measured on the incline, making the total rise 100 ft. if the incline is 300 ft. in length, the effective work performed in raising 400 tons to a vertical height of 100 ft., is 400 × 2,000 × 100 = 80,000,000 ft.-lb. Then, adding 40 per cent for friction, makes the total work performed 80,000,000 × 1.40 = 112,000,000 ft.-lb. One hundred and twelve horsepower would perform this work in about 30 min.; or 224 hp. in about 15 min.

Question—*How many units of work will be performed in raising 20 cu.ft. of water to a height of 100 ft.?*

Answer—Taking the weight of 1 cu.ft. of water as 62.5 lb., 20 cu.ft. will weigh 20 × 62.5 = 1,250 lb. To raise this weight to a vertical height of 100 ft. will require the performance of 1,250 × 100 = 125,000 ft.-lb., or units of work.

Question—*Define a unit of work.*

Answer—A unit of work is the work required to raise 1 lb. to a vertical height of 1 ft., without respect to the time in which that work is performed.

Question—(*a*) *What is the average composition of firedamp and blackdamp, as given off naturally in coal mines; and what quantity of the latter is necessary in air to make it* (*b*) *dangerous to breathe;* (*c*) *extinctive of the flame of an oil lamp?*

Answer—(*a*) Both firedamp and blackdamp are variable mixtures of gas and air and it is not possible to state an average composition of these mixtures, as they occur in mines. Firedamp is understood to be a mixture of methane or marsh gas with air, in any inflammable or explosive proportion. Blackdamp is a mixture of carbon dioxide and air in any proportion, the mixture having then a less percentage of oxygen than in normal air.

(*b*) The breathing of air containing from 5 to 6 per cent of carbon dioxide causes panting and is harmful, while 18 per cent of this gas, in otherwise normal air, will not support life; but will, in time, cause suffocation and death.

(*c*) A lamp flame burning sperm or cottonseed oil will be extinguished in air containing 14 per cent of carbon dioxide, provided the air is otherwise normal.

Question — *What is the water-rate of an engine?*

Answer—The water-rate of a steam engine is expressed by the weight of water consumed, per horsepower per hour. This depends on the style or type of engine in use and may be calculated when the mean effective steam pressure is known, the piston displacement per stroke, the percentage of clearance and the speed (r.p.m.) of the engine. It is fair to assume the average water-rate of an ordinary slide-valve engine, cutting off at two-thirds stroke, is, say 40 lb. per horse-power-hour.

Question—*Find the size of compressor that will be required to compress 96 cu.ft. of free air, per minute, to a gage pressure of 80 lb. per sq.in., at sea level, assuming an efficiency of 85 per cent in the air cylinder, the engine making, say 125 r.p.m., or 250 strokes per minute.*

Answer—The air cylinder having an efficiency of 85 per cent, the piston displacement required is 96 ÷ 0.85 = 113 cu.ft. per min. Then, assuming that the ratio of the length of stroke to diameter of the cylinder is 1⅓, the required diameter of the cylinder is

$$d = \sqrt[3]{\frac{1{,}728 \times 113}{0.7854 \times 1\tfrac{1}{3} \times 250}} = 9.07, \text{ say } 9 \text{ in.}$$

The length of stroke is then 1⅓ × 9 = 12 in., and the required size of the air cylinder is 9 x 12 in.

Question—*What is the meaning of the so-called "capacity" of an air compressor?*

Answer—When speaking of the capacity of an air compressor the meaning is the volume of free air the compressor will handle, expressed in cubic feet per minute. It is the piston displacement of the air cylinder, in a single-stage compressor. In compound air compression, the capacity of the compressor is the piston displacement of the large low-pressure cylinder.

Question—*What is the meaning of the expression, volumetric efficiency, in air compression?*

Answer—By the volumetric efficiency of an air compressor is sometimes meant the ratio of the volume of compressed air delivered, to the piston displacement or the so-called capacity.

As more generally used, however, the expression "volumetric efficiency" has reference to the ratio of the number of expansions in the air, at sea level, to the number of expansions required at any altitude, for the same gage pressure in each case. Volumetric efficiency is expressed in percentage. In the more general usage of the term, it is the percentage of compressed air delivered per revolution, at any altitude, as compared to the volume delivered per revolution at sea level.

Expressed in other words, the volumetric efficiency of a compressor, expressed in percentage, is therefore the ratio of the number of expansions in the air, compressed at sea level, to the number of expansions in the air, at any altitude, for the same gage pressure.

Freight Loadings, Including Coal, Gain; Decrease of 9,550 in Idle Cars

LOADING of revenue freight totaled 777,359 cars during the week ended May 13, compared with 755,749 cars during the preceding week, or an increase of 21,610 cars. This was an increase of 26,173 cars over the corresponding week last year but a decrease of 65,786 compared with the corresponding week in 1920. Coal loadings totaled 79,170 cars, 3,760 in excess of the preceding week. This was, however, 82,109 cars below the total for the corresponding week in 1921 and 84,438 below the corresponding week in 1920. An increase compared with the week before of 689 cars was reported for coke, which totaled 8,813 cars. This was 3,330 cars above the same week last year but 1,086 under the same week two years ago.

Freight cars idle because of business conditions totaled 512,196 on May 15, compared with 521,746 on May 8, or a decrease of 9,550 cars. Surplus coal cars totaled 218,466, or a reduction within the same period of 7,810 cars. A decrease within a week of 160 was reported for coke cars, which totaled 5,190.

Mine Fatalities for April Fell with Closing of Many Operations

A SMALLER number of fatalities at coal mines during April was the natural result of the closing down of many mines throughout the country by the general strike which began April 1. Reports received by the U. S. Bureau of Mines show 72 accidental deaths during the month, as compared with 164 during the same month last year. All of the 72 fatalities were at bituminous mines, while of the 164 fatal accidents in April a year ago 55 were at the anthracite mines in Pennsylvania and 109 at bituminous mines throughout the country. The fatality rate for April, 1922, was 4.56 per million tons of bituminous coal mined, based upon an output of 15,780,000 tons. No anthracite coal was produced during the month except about 24,000 tons of steam sizes dredged from the rivers. For April, 1921, the fatality rate was 3.96 for bituminous mines, 7.14 for anthracite mines, and 4.65 for both classes of mines combined. The production in April, 1921, was 27,553,000 tons bituminous and 7,703,000 tons anthracite.

During the past nine years (1913-1921) the month of April has averaged 222 fatalities, with an average production of 41,529,000 tons of coal, indicating a fatality rate of 5.35 per million tons mined. For bituminous mines alone the 9-year rate for April was 5.09, while for anthracite mines it was 6.57. It will thus be seen that the bituminous rate for April, 1922, while higher than for the same month last year, is lower than the average for that month during the past nine years.

During the first four months of 1922, 648 coal miners have lost their lives by accidents in the mines, as compared with 658 durng the corresponding period last year. These figures represent fatality rates of 3.89 and 4.13, respectively, for each million tons of coal produced. If the anthracite figures for April of both years be excluded, the first four months of the present year show a fatality rate of 3.89 per million tons as compared with 3.98 for the corresponding period a year ago.

The causes of the accidents during the past four months, considered in relation to the quantity of coal mined, present no striking features, as compared with the corresponding month a year ago, other than those pointed out in the monthly report for March. The fatality rate from gas and dust explosions is still much higher than that for the first four months last year or for the entire year 1921; in fact, it is more than twice as high. All of the other main causes of accidents, however, show reduced fatality rates, particularly in the number of fatalities due to explosives and electricity.

No large disasters occurred during April, all of the reported fatalities being those usually classified as normal; in other words, no single accident killed as many as five men.

COAL-MINE FATALITIES DURING APRIL, 1922, BY CAUSES AND STATES

(Compiled by Bureau of Mines and Published by *Coal Age*)

State	Underground													Shaft					Surface							Total by States	
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal	Mine cars and locomotives	Gas explosions and burning gas	Coal dust explosions (including gas and dust combined)	Explosives	Suffocation from mine gases	Electricity	Animals	Mining machines	Mine fires (burned, suffocated, etc.)	Other causes	Total	Falling down shafts or slopes	Objects falling down shafts or slopes	Cage, skip, or bucket	Other causes	Total	Mine cars and mine locomotives	Electricity	Machinery	Boiler explosions or bursting steam pipes	Railway cars and locomotives	Other causes	Total	1922	1921
Alabama	6		1										7													7	9
Alaska																										0	0
Arkansas[1]																											1
Colorado	1		1										2													2	3
Illinois	2		2										4													4	10
Indiana																										[illegible]	5
Iowa																										[illegible]	3
Kansas																										0	2
Kentucky	4		1		2	1				1			9													9	9
Maryland																										[illegible]	[illegible]
Michigan																										[illegible]	0
Missouri																										0	1
Montana																										0	1
New Mexico										1			1			1		1								2	3
North Dakota																										0	1
Ohio																										[illegible]	9
Oklahoma	1												1									1			1	2	3
Pennsylvania (bituminous)	7	2	5							1			15										1	1	2	17	14
South Dakota																										0	[illegible]
Tennessee		1											1													1	1
Texas																										[illegible]	[illegible]
Utah																										1	1
Virginia		1											1													1	1
Washington	1												1													1	1
West Virginia	15	1	6							2			24										1		1	25	28
Wyoming																										0	5
Total (bituminous)	37	5	17		2	1				5			67			1		1				1	2	1	4	72	109
Pennsylvania (anthracite)																										0	55
Total, April, 1922	37	5	17		2	1				5			67			1		1				1	2	1	4	72	
Total, April, 1921	[illegible]	10	[illegible]	11	2	[illegible]		3	1			7	157	1	1			2			1		1	[illegible]	5	.....	164

[1] No report received.

Restrict Opening of New Mines, Says G. S. Rice, To Overcome Intermittency in Coal Industry

BELIEVING that basic readjustments in the coal industry will grow out of the strike, George S. Rice, chief mining engineer of the Bureau of Mines, has brought to the attention of the administration officials dealing with the strike situation the plan which he has advocated for several years looking to temporary restraints in the opening of new coal mines. He believes that intermittency in the coal industry will continue until the development of the coal industry is brought into step with the country's coal requirements. Mr. Rice expresses himself on the subject as follows:

"I propose a temporary restraint in the opening of new bituminous or sub-bituminous mines which intend to enter into interstate business, by withholding track connections and car service until the prospective operators demonstrate in open court proceedings to the Interstate Commerce Commission that there is need of additional coal production for the fuel needs in the districts served by the railroad or railroads which could provide connections for a prospective mine.

"Striking features of the situation are the continued increase in coal production or consumption of the country and the more rapid rise in mine-employee production capacity, which has exceeded the consumption each year from 125,000,000 to 300,000,000 tons, based on the average—210,000,000 tons in 1921, or 40 per cent in excess of needs.

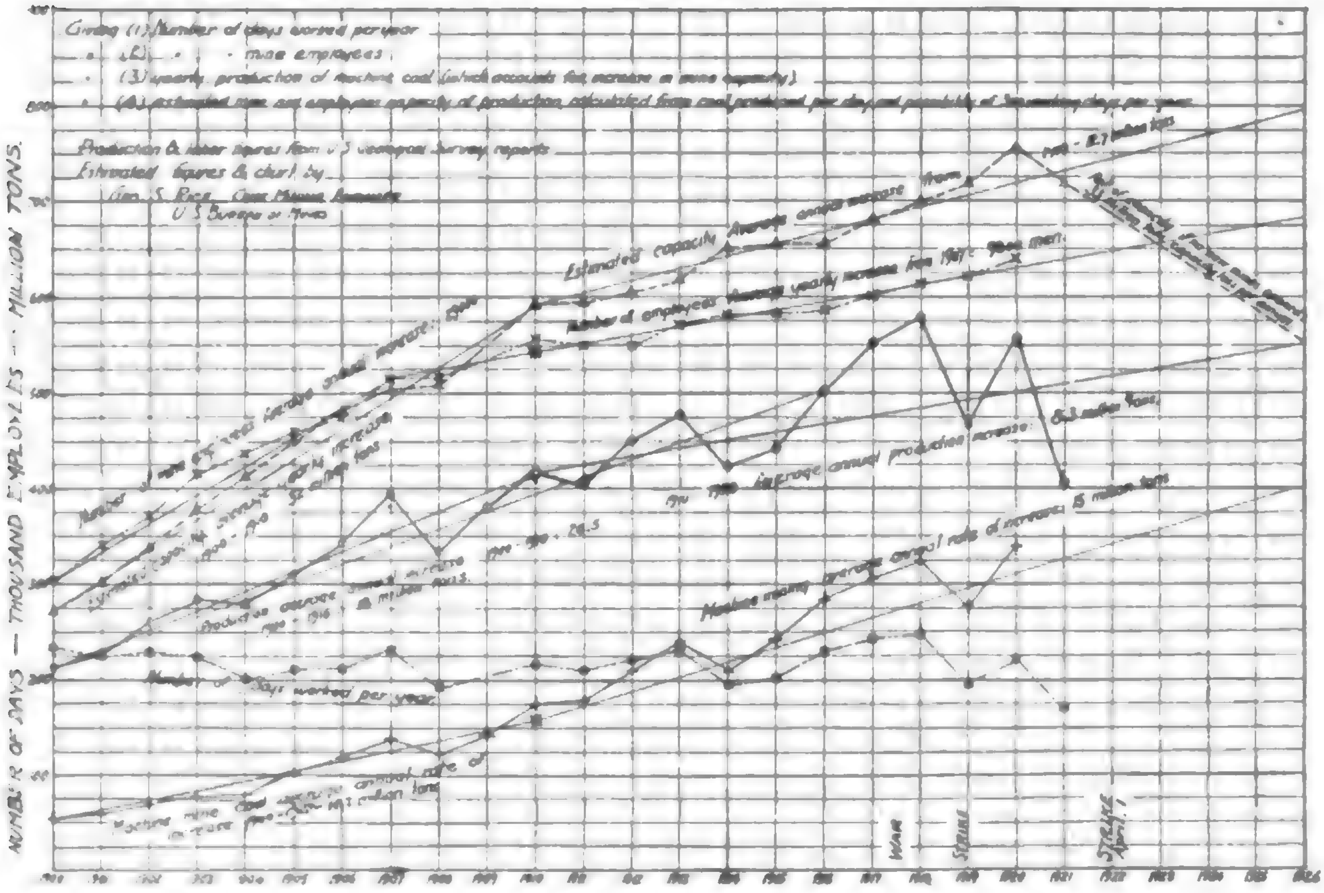
"Obviously such conditions lead to industrial instability, bankruptcy of companies, and forced idleness of employees, who must have high wages to compensate, and consequent increased cost of coal to consumers. Because of the excessive competition, there is loss of resources through mining only the best and more cheaply mined coal beds or portions of coal beds.

"No other basic remedy for these evils appears. Trade combinations are obnoxious as well as illegal. Government control is believed not to be good, and was not successful, economically speaking, even under the paternal government in Germany.

"Under the proposed method the restraint would not be a real handicap to owners of mineral. They would benefit in the long run, as fortunately the restraint would not have to extend for longer than a few years. This is because the consumption of the country has increased rapidly. An even larger factor is the depletion of existing mines. Twenty years represents the average lifetime of a bituminous mine, so that approximately 5 per cent of the mines are worked out each year. This is a decrease in productivity at the present time of 25,000,000 tons. This plus the present rate in consumption increase makes a total of approximately 33,000,000 tons capacity supplied each year by new mines. Hence in five years if no new mines are opened, the production would fall below the projected average consumption line. This would manifestly be carrying the production capacity too low. It would be sufficient to check new development only two or three years, leaving an excess capacity of 100,000,000 tons for peak loads of consumption or for special emergencies.

"I can see no other remedy without comprehensive government control, which, it is feared, would mean destruction of initiative of competition and undoubtedly would be objectionable to the majority of the people."

CHART ILLUSTRATING ANNUAL INCREASE IN BITUMINOUS AND SUB-BITUMINOUS PRODUCTION IN THE UNITED STATES, ANNUALLY FROM 1900 TO DATE, IN SHORT TONS; ALSO LABOR STATISTICS



Possibilities of General Price Conference Eclipse Interest in Reduction of Freight Rates

By Paul Wooton

Washington Correspondent of *Coal Age*

During the last week the interest of the coal industry has been centered on Washington more than at any time since the days of the Fuel Administration. The price conference called by Mr. Hoover is expected to be a memorable gathering. It is a great experiment on the part of the administration to see how far an industry can go in regulating itself in a time of emergency. As Mr. Hoover frankly states, there is not a vestige of law with which to compel operators to participate in this experiment. It is entirely a unanimous consent proposition.

While many conditions are favorable for such an undertaking, there is a fundamental weakness in that non-union operators are not accustomed to co-operation among themselves. The union operators have had to negotiate wage scales and undertake other joint activities. This is the first time, however, that the non-union operators have been called together for a united effort. It is admitted that this makes for difficulties in organization. There will be more trouble in selecting the leaders and more difficulty in obtaining unified action.

Speculation as to the possibilities of the general price conference has been the matter uppermost in the thought and discussion in coal circles during the week. It has even eclipsed interest in the opinion of the Interstate Commerce Commission reducing freight rates, despite the fact that the reduction means the saving of some $75,000,000 per year in the amount paid for freight on coal. The decision means that if the railroads are correct in their statement that the average rate paid on coal in 1921 was $2.27 per ton it reduces the average freight rate to $2.05 per ton. If the railroads' calculation that the average freight charge on coal was $113.50 per car in 1921 is correct, it means that the rate will be $102.50 per car when the new rates go into effect.

There is some difference of opinion as to what it is that has had such a tranquilizing effect on prices. Some are inclined to give most of the credit to Mr. Hoover, but there can be no denying that the sharp increase in production has been a potent factor in the situation. On May 26 500,000 tons of coal were en route to Hampton Roads.

Practically all the increase in production came from the middle Appalachian region. Advices from Alabama and from southern Virginia are to the effect that they could mine much more coal if the orders for it were forthcoming.

While production is running around the 5,000,000-ton mark, it still is a million tons behind the estimated production for the first week of the strike—to say nothing of the fact that this is the eighth week of its duration. The operators who declared before the strike that the non-union fields could produce at least 6,000,000 tons from April 1 on defend their estimate by stating that it would have been realized had there been a market for that amount of coal.

Advices reaching official Washington are to the effect that some defections from the union are continuing in the Connellsville district, in the New River field and in Tennessee and southeastern Kentucky, but the numer of union men who have gone back to work constitute too small a percentage of the total number of strikers to be of any great significance.

With the distribution structure warped by the flow of coal along abnormal routes, it is expected that there will be wide ranges in delivered prices of coal. If coal moves from Alabama to Chicago, the freight rate necessarily must be added, making for a much higher price than would be paid at tidewater points on the Atlantic Coast.

So far as Washington had been advised late last week, no organizations for the pooling of purchasing had been prefected, with the exception of the railroads' committee in Chicago.

Mining and Electrical Engineers Discuss Coal-Mine Power

Should a coal mine buy its electric power or develop its own? This question was approached from many angles by well-informed and incisive thinkers at the joint meeting, May 22, of the Chicago sections of the American Institute of Electrical Engineers and the American Institute of Mining and Metallurgical Engineers with the Western Society of Engineers at the Society's rooms in Chicago. The burden of opinion advanced in addresses, papers and discussions appeared to be that the biggest mines can profitably maintain individual or group power-generating station of their own, while those of middle size may or may not, depending upon the case with which they can get service and upon local conditions, but that the small mine almost invariably should be a power purchaser.

The case for purchased power was presented mainly by J. Paul Clayton, vice-president of the Central Illinois Public Service Co., of Springfield, Ill., and in a paper by J. C. Damon, of the West Penn Power Co., of Pittsburgh, Pa., read by W. D. Cameron, of the General Electric Co. W. C. Adams, of Allen & Garcia, set forth that there is a place for both purchased power and locally developed power and that each should be recognized in its own field. A discussion written by C. M. Garland, of Chicago, consulting engineer for the Nason Coal Co., who built the power plant of the Nokomis mine, and which was read by F. G. Fabian, secretary of the A. I. M. M. E., held that the costs of locally developed power estimated by Mr. Damon and Mr. Clayton were far too high. Mr. Garland aroused a good deal of spirited debate by his statement that the Nokomis mine generates current at 0.27c. per kilowatt hour, which is about one-third of what is accepted as the normal cost. Both Andrews Allen and John A. Garcia, of Allen & Garcia, spoke, as did Carl Lee, electrical engineer for the Peabody Coal Co.

The main arguments of Mr. Clayton and Mr. Damon for purchased power were that mines were relieved of making large capital investments in power plant, that they got more dependable service during times of strikes and other periods of stress and that the power cost per ton of coal mined was lower. Central stations, they said, can operate at higher efficiency because they have a larger and more specialized engineering force, giving their entire time to the question of power, and because the diversified load running from lighting at night to power by day makes for higher efficiency than any average mine power plant could attain.

Material developed at this meeting on the question of mine power will appear in later issues of *Coal Age*.

How Come?—Although the mines of Indiana were idle all the month of April, a survey of the report of the State Industrial Board during that month shows the coal industry second in the list of accidents during the thirty-day period. The automobile industry had 301 accidents and the coal mining industry, 242.

Alabama Mine Explosion Kills Eleven Men.—Fire damp is said to have been the cause of an explosion, May 26, at Acmar No. 3 mine of the Alamaba Fuel & Iron Co., St. Clair County, Alabama. Eleven men were killed out of eighty-two at work. Little property damage was done.

Eighth Week of the Coal Strike

EDITORIAL REVIEW

INTEREST in the strike itself in its eighth week was eclipsed by the phenomenon of the sharp downward turn in prices, accompanied by the highest production—approximately 5,000,000 tons—reached in any week since April 1.

In anthracite, where for two months and a half operators and miners have been in regular conference, there is an absolute deadlock. The operators have stated their reasons for demanding a decrease in wages and the miners refuse to consider anything but their original proposals, which call for a 20-per cent increase. It does not seem likely that the situation in anthracite will be allowed to drift much longer. The next move is for one side or the other to request the friendly office of the government as arbitrator. This, it is expected, will transpire before the end of June.

In the bituminous field there is not the least suggestion of a break in the ranks of either the miners or the operators. The belief that Frank Farrington stood ready to break loose from the International, defy Lewis and his policy of national settlement, and put the Illinois miners to work has been thoroughly dispelled. It is now pretty generally conceded that Mr. Farrington cannot deliver the Illinois miners even if he would. Furthermore, there is no disposition on the part of any large operator in Illinois to break away from the solid ranks of the producers.

Production in the non-union fields of central Pennsylvania is slowly increasing. It is pointed out that the extreme quietude in the union fields has favored the congregation in non-union fields of all the best organizers If there were any difficulties in the union field these organizers would speedily be recalled and the situation in the non-union field would rapidly be cleared up.

Anthracite Miners Reject Proposed Wage Cut; Insist on Original Demands

THE anthracite mine workers have formally rejected the counter proposal of the operators for an average wage reduction of 21 per cent and a five-year agreement with provision for annual adjustment of rates of pay through conference or arbitration. In their reply, made public Thursday, May 25, the miners insist upon a further consideration of their original demands.

The statement of the miners was made public at the conclusion of the meeting of the joint subcommittee of operators and miners' representatives at the Union League Club, New York, and is signed by John L. Lewis, International president of the United Mine Workers of America, and the three district presidents, W. J. Brennan, Thomas Kennedy and C. J. Golden.

Addressed to S. D. Warriner, W. J. Richards, W. L. Connell and W. W. Inglis, representing the operators, the reply, which was lengthy, stated that "to accept the proposal of the operators would be to permit the degradation of the miners in order that the consumers of coal may continue to be unconscionably exploited to the amount of at least $5 a ton by the anthracite monopoly."

The first paragraph of the reply thus summarizes the attitude of the mine workers: "After a complete study and analysis of your arguments and supporting data we have to inform you that we find ourselves unable to accept your propositions and must insist upon a further consideration of our original requests for changes in the standards of work and compensation which now prevail in the anthracite coal mining industry.

"We are fully alive to and profoundly impressed with the importance of the fact that not only our interests as well as your own are involved in the proper adjustment of our differences," the document proceeds, "but also, as you state, that there is a third group whose interests are equally at stake composed of the general public, or, to be more specific, of those who use anthracite coal for domestic and industrial purposes. We thoroughly realize also that in the long run our own well-being as well as the general prosperity of the industry is dependent upon a proper safeguarding of the public interest.

"Furthermore, we agree with you completely that any unwarranted inflation in operating and distributing costs which have developed during the war or post-war period should be eliminated and corresponding reductions in prices to the consumers of anthracite coal should be made. We have repeatedly, during the course of our conferences, directed your attention to this attitude on our part and have sought directly your co-operation in requesting complete investigation by the Interstate Commerce Commission and the Federal Trade Commission with the practical end in view of ascertaining and eliminating excess costs of production and distribution. In this connection we have submitted for your consideration unimpeachable evidence that the price of anthracite coal to the domestic consumer could be reduced at least $5 a ton if we could secure your support in practical measures for lowering freight rates to a just and reasonable level and in preventing the exaction of needless and indefensible monopoly profits and charges in the distribution of the anthracite coal supply.

"These profits, as we have repeatedly pointed out to you, arise from three sources and are in large part concealed from the view of the public: (1) From the direct mining of coal; (2) from the ownership of the anthracite coal-carrying railroads, which control coal-producing companies mining four-fifths of the output of the mines, and which, in order to obtain large but concealed profits for the anthracite monopoly and to prevent competition from independent producers, have imposed grossly excessive freight rates on anthracite coal, and (3) from the maintenance by the large operators or coal-mining companies of separately organized *coal sales* companies through which an added heavy tribute is placed upon the distribution of coal. . . .

"Even the extreme wage reductions which you propose could not result in any substantial reduction in the price of coal," the reply goes on, "and probably would not bring about any decline in coal prices whatsoever. We have shown during our conferences by official governmental data that the labor cost incident to the production of coal is such a small item in the price paid by the consumer that even though wage rates were ruthlessly slashed in complete disregard of the right of the workers to a living wage, no reduction of any consequence in coal prices could thereby be secured. Thus the total labor cost in producing a ton of anthracite is only $3.50, or about 25 per cent of the retail price. Therefore a radical reduction of even 21 per cent in present wage rates, as you propose, would mean a reduction of not over 75c. per ton, or only about 5 per cent, in the price to the consumer. Probably this small amount would be absorbed in the process of distribution and the consumer would receive no benefit.

"These figures demonstrate, however, that the present high prices of anthracite cannot be attributed to any increases in wage rates, for the labor cost of a ton of coal is now only $3.50, whereas the *increase* in retail price of coal since 1913 has been from 8 to 10 per ton. . . .

"We know that the public wishes the miners to earn an amount sufficient to maintain themselves and their familes in health and decency, according to a reasonably comfortable American standard of living, and are willing that the necessary labor costs to bring this about should be paid by the operators. Consumers are also entirely willing that the operators should have resonable profits and that the anthracite railroads should receive fair and adequate returns for the transportation of coal from the mines to the markets."

Contending that labor is not a commodity, the reply recites: "We wish to direct your attention to the fact that in proposing a five-year agreement and a board of compulsory arbitration: (1) You completely ignored the principles of a saving wage, complete union recognition, and the eight-hour day, and (2) you accept the position that labor is a commodity and specifically provide that the board proposed should function on this assumption. . . .

"You purpose that this basic wage for the loborer in the industry be reduced from $4.20 to $3 a day. On the basis of such a rate, the maximum possibilities in the way of annual earnings would be only $810. According to the reports made for you by the National Industrial Conference Board this amount would be scarcely sufficient for the subsistence of an unmarried worker, and would be absoluely inadequate for the maintenance of any basis of a normal family."

The representatives of the operators took the miners' reply under consideration and adjourned to meet on May 26. No session was held on that date, however, announcement being made on Friday that the joint committee had adjourned until Friday, June 2.

Later in the day S. D. Warriner, chairman of the operators' committee, gave out a statement in which he said: "We have stated from the outset—and we repeat—the granting of these demands is an impossibility and a wage reduction imperative. Our attitude in this respect is unchanged."

Miners Return to Work in Connellsville Region in Gradually Increasing Numbers

THE eighth week of the attempt to unionize the Connellsville coke region closes with slight but material gains made by the operators in increasing the region's output and with further evidence that the public has tired of the situation. Following a series of dynamitings of homes of miners who had refused to join the walkout, Sheriff I. I. Shaw withdrew the permission accorded organizers for open-air meetings. Future indoor meetings will be held under close supervision of the state police.

The drift of non-union miners back to work not only continues but has increased slightly. The following H. C. Frick Coke Co. plants have been able to resume operations on the bases mentioned: Wynn, 20 per cent; Collier, 35 per cent; York Run, 10 per cent. At the Leisenring No. 1 plant, where work was resumed and stopped again, operation has again started with 15 per cent of the normal force.

The Nemacolin plant of the Youngstown Sheet & Tube Co. has resumed at about 15 per cent. The Mather Collieries Co., however, is running normal, and the Crucible Fuel Co. nearly so. The Thompson No. 1 plant of the Redstone Coal & Coke Co., at Republic, is running about 15 per cent.

The Reliance Coal & Coke Co., at Denbo, which is between and close to two union plants of the Vesta Coal Co., has resumed at about 10 per cent. The Alicia No. 1 plant of the Pittsburgh Steel Co. also has started on a 10 per cent basis. The Linn mine of the American Coke Corporation is working 20 per cent of normal. The Warwick mine of the Diamond Coal & Coke Co. has resumed operation on about a 50 per cent basis.

Ohio Operator Offers Mine Workers 60-Per Cent Profit-Sharing Plan

J. W. BLOWER, president of the Hisylvania Coal Co., of Columbus, Ohio, which operates a large mine at Glouster, Ohio, which is in the Hocking Valley field, made a proposition to his miners which has attracted a good deal of attention in mining circles. He has figured out that he can give the miners, including day men and in fact all mine labor, 60 per cent of the total gross receipts received for the sale of coal. Thirty per cent would be kept for operating costs and the company reimbursed in the sum of 10 per cent. Figuring over a period of 21 years he finds that he could do this and can increase the efficiency of his men.

Mr. Blower is of the opinion that loading of dirt and bone coal will be prevented if the loss in the sale of the carload falls partly on the men. The miners have received the proposition enthusiastically and propaganda for such an arrangement with the miners in that district is being circulated.

Farrington Refuses to Talk Peace; Is This Turning Point of Strike?

"NO" is the flat answer of Frank Farrington, president of the Illinois miners, to the recent letter of the operators of that state asking him if he is ready now to confer regarding a separate agreement in Illinois between miners and owners. "We cannot meet you until our International union will allow us to," he says. This is the most definite thing Mr. Farrington has said in the interchange of messages between Illinois operators and himself during the last two months. And now that this bit of evidence is in, controverting the oft-repeated opinion that Farrington and the Illinois operators were "in cahoots" to make a deal whenever the time was ripe, wise coal men are expecting a definite turn in strike affairs.

In Illinois just now the only other feature of the strike situation which disturbs is the dispute, fast coming to a court trial, of the engineer question. At the opening of the strike, engineers stayed on their jobs according to contract until an argument arose because certain operators exercised their rights under the contract and dispensed with engineers. Then a large number quit. Attorney General E. H. Brundage of Illinois decided the agreement justified the operators. Then he wrote another decision practically reversing himself. Robert M. Medill, State Director of the Department of Mines and Minerals, ordered mine inspectors to report any mine where a hoist was being operated by any but a hoisting engineer possessing a certificate of competency issued by the State Board of Mine Examiners.

Thus, even though a strike exists and the mines are not in operation, an effort is being made to compel the employment of union engineers on the ground that the mine safety laws are being violated. As soon as arrests are made of company men operating hoists without a certificate, test cases will be brought to trial and fought to a finish.

The full text of Mr. Farrington's answer to the Illinois operators follows:

"Answering the letter dated May 18 and signed by the presidents of the three operators' associations in Illinois and concerning the matter of meeting for the purpose of trying to negotiate a district agreement, I advise that I presented this letter to a meeting of our district executive board today and that body authorized me to notify you and your associates that the miners' district executive board declines to meet the operators in wage-scale conference for the purpose of trying to make a district agreement.

"The board also authorized me to notify you and your associates that until the policy of our International union will allow us to do so, we cannot meet you in district wage-scale conference. When the policy of our International union is changed so as to allow for district agreements, then we shall gladly meet the operators in wage-scale conference, but until that time arrives we cannot do so."

Utah's Trouble With Armed Aliens May Yet Lead to Bloodshed

THE strike situation in the Utah coal fields is tremulous. Only a few of the aliens who were ordered to surrender their arms to the officers of Carbon County have responded and plans to compel them to do so are under way. Many think blood will be shed. Additional deputies have arrived on the scene, bringing with them plenty of rifles and munitions. Carbon County is nearing bankruptcy after maintaining the deputies for so long. State aid has been asked. The Wattis mine, in the south end of Carbon County, has been reopened and will be worked under the protection of armed men. This is expected to precipitate trouble.

Tennessee Coal & Iron Co. Raises Wages

A VOLUNTARY advance of 10 per cent in wages has been granted by the Tennessee Coal, Iron & Railroad Co. to coal miners in the Birmingham (Ala.) district. Several thousand men will be affected. This brings the rate asked. The Wattis mine, in the south end of Carbon County,

National Coal Association, in Convention, Adopts Labor Platform; Nationwide Support Given

LIVELY discussion, attendance that exceeded the expected and concrete results marked the annual convention of the National Coal Association at Chicago on May 24 and 25. The presidency moved west, A. M. Ogle, of Indiana, succeeding J. G. Bradley, of West Virginia. Gloomy forebodings that the National was in danger of shipwreck were proven unfounded, every section of the country rising to the support of the new administration.

The meetings, which extended over a day and a half, were largely devoted to routine business, the reports of standing committees and the election of officers. On the first day T. H. Watkins, after making his formal report as chairman of the Foreign Trade Committee, departed from his text to discuss the affairs of the association in general. He said:

"I speak plainly because I think the time has come for plain talk about the future of the National Coal Association. I think this is an abominably inefficient industry in the way it is conducted. We won't get stabilization out of this industry at all; we have to get the stabilization within the industry. There are plenty of men of ability in this room that don't work together. Of course, ther are differences of opinion.

"If the National Coal Association is going to be a factor and a success, its members must work together—pay the necessary money for this thing. I tell you that the criticism that is directed against us is just in a great many ways. There is in this industry enormous waste, especially when we go through such tremendous depressions as the country suffered from last year. There is no chance, the way we are organized today, to regularize our business, to put a clamp on it, with the lack of information we have and the lack of co-operation that there is in the industry today. There are so many elements of production and distribution and all of that that there is inevitably bound to be waste.

"You may know there is waste, but you can't correct it under the present conditions. I have no panacea for this that will correct it tomorrow. I say that the waste and inefficiency have to be eliminated from within. If we don't do it from within, we are going to have a lot of experiments that are dangerous and disastrous to the nation itself, and the responsibility is upon us greater than upon any other group. We are servants of the public. We have a right to be treated as servants—with proper return for our capital, proper return for the day's labor. We must insist upon that, but we must not forget our obligation to society as a whole."

Immediately P. H. Penna, of Indiana, rose and, obtaining the permission of the chair to talk to Mr. Watkins' remarks, rather than the subject of foreign trade, made it clear that he was in harmony with the ideas of Mr. Watkins as to the need for a new, broad policy for the National Coal Association. He said, in part:

"I believe the time has come when the National Coal Association must depart, in order to be effective and in order to render the greatest efficiency, from its past policies. I think that in the past few years we have all been up against experiences that have perhaps caused us to modify our opinions and thoughts and to change our ideas, and it is said that in the school of experience intelligent men change.

"We started out with this association as an emergency proposition, and all labor questions were taboo from discussions. We were not permitted to discuss them, and we were hardly permitted to think about them on the quiet in our meetings. We have had every phase of opinion represented in our coal association. We have had the people who believed in collective bargaining, and we have had those who were opposed to collective bargaining. We have sat across the table looking at each other with suspicion, looking at each other with doubt, and we have never gotten to the position yet where we could clasp hands with our hearts representing our interest in our industry.

"Permit me, gentlemen, to state plainly certain things and not to ignore facts. We who have believed in collective bargaining have looked with suspicion against our friends who did not believe in it, and they in turn have looked with suspicion at us who did believe in it; and we perhaps have reached the point where we have questioned the sincerity of men's motives, and we have been apart, and we have not been allowed to discuss that matter; it has been taboo, shut off—keep quiet, don't mention it! That must pass, gentlemen. We may disagree, and we may disagree positively, but men will disagree and respect their friendship for each other even in their disagreement.

"Today I think that the greatest menace to the United States of America is that the industry of the United States of America is a labor union movement. I think it is illegal and criminal *per se*. I never felt that until recently. Events have driven me to that conclusion. I would like, if I could, to wipe out not only the United Mine Workers of America but all memory of the institute. Nobody has worked for it harder than I have; nobody has worked harder in the interest of collective bargaining than I have; nobody has advocated more strenuously the check-off system in aid of the collective-bargaining idea than I have. I wouldn't do it again; I come to you today frankly and say to you just as seriously and just as sincerely and just as honestly as I have worked in the past that I would not do those things because in my opinion we have made a mistake.

SAYS IRRESPONSIBILITY IS UNION'S BEST ASSET

"I am not saying that because we are on strike; I am not saying that to ask any sympathy; we don't want sympathy; that is the last thing in the world. I am saying it to you as man to man, as I believe we have made a mistake. I am ready to capitulate to that extent, and the mistake is that the labor end of the business is irresponsible, that their irresponsibility is their greatest asset, that they spend their entire time capitalizing that asset to our disadvantage. I believe this, gentlemen; I believe it in my heart, honestly and squarely, and I believe that the time has come when industry in America must demand one of two things: First, that labor unionism become responsible like we are responsible, or that we must as American citizens, loyal to the Constitution of the United States, meet every sacrifice imposed upon us to wipe out trade unionism in its entirety.

"We ought not any longer to taboo the labor business from our industry."

Mr. Penna's statement created a great deal of comment, apparently all favorable. It was therefore no surprise that Mr. Ogle in his address, on first taking the chair as the new president, committed his administration to the policy of adding labor to the curricula of the association. True, he delimited and defined the scope of the action of the association in this respect, but he opened the way. In the following words he stated the labor platform of the National Coal Association:

"We could not hope to make progress in the advancement of our industry without first establishing acquaintance and confidence among ourselves, and this has progressed to the point where we have made such advancement in the development of this acquaintance and confidence that at the present time I think we should all feel assured of our ability to meet and successfully solve any problem that presents itself to us. In the past our association has studiously avoided discussion of labor questions because of the seeming wide divergence of interest and view between producers in the non-union fields and producers in the union fields. But labor is the foundation upon which our industry is built.

"Gentlemen, our retiring president, Mr. Bradley, expressed a view that our association should be prepared to meet squarely any of the broad economic problems that might be encountered in the industry, even though this question of labor might be involved. Many other of our associates and members have expressed this same view. At the present time our industry is facing a serious issue over this question of labor.

"All the union miners in the country, with the exception of a relatively small number in western Kentucky, are on strike, and I feel that this association should not flinch from the issue presented and should not dodge the issue. The absence of a full and complete presentation of the attitude of our industry on this labor question has laid us open to severe, unfair, and uninformed criticism from those not acquainted with our situation.

"I do not suggest that the National Coal Association should undertake to function in making wage contracts, attempt to make negotiations of wage contracts or direct negotiations of wage contracts in any district in this country, but I do feel that we, as the representative body of this industry in this country, can agree upon certain principles which will help to guide us on our way in the solution of our problems, and I would like to suggest one or two: First, that we recognize the fundamental and inherent right of every individual engaged in this industry or of every group or district of individual producers to determine for himself or itself the policy in dealing with this labor question; and that there should be no quarrel with that district after it has made its decision; and that there should be nothing done by other districts to interfere in any way with that district in carrying out its policy after it has been determined. Doesn't that answer the question that has disturbed us about whether we work non-union in some districts or whether we work union in other districts?

"After agreeing upon that principle: Second, that in those districts where the principle of collective bargaining may be continued, we should support and assist in every way possible, where the request is made from that district, the establishment of equal and full responsibility and recognition of obligation on both sides and of both parties to the contract."

A report of the committee on statistics, of which T. W. Guthrie was chairman, provoked prolonged discussion. The history of the efforts of the locals and the national associations to gather more complete and regular statistics has demonstrated the apathy and hostility of many operators to such a program. But there was no evidence of this feeling on the floor of the convention. Representatives from every Northern and Western coal field rose to speak of the advisability and necessity of adequate data on coal. Challenged by F. W. Wilshire to make their presence known, the opponents of "fact-finding" failed to come forward. It was a case of "the ayes seem to have it; the ayes have it." But, unfortunately, there were less than 300 at the meeting, of the several thousand who must participate in any such program.

Committees on cost accounting, publicity, railroad relations and government relations reported the history of the year. It was announced that the association organ, *Coal Review*, is now practically able to pay its own way from advertising. No account of the convention would be complete without recording the fulsome praise and honest recognition accorded the salaried staff of the National in Washington. The announcement that the overhead expense of the organization had been reduced from the peak of $30,000 per month to $10,000 per month was received with applause.

The following are the officers elected for the coming year:

President—Alfred M. Ogle, Terre Haute, Ind.
Vice-Presidents—S. Pemberton Hutchinson, Philadelphia, Pa.; Thomas T. Brewster, St Louis, Mo.; Ira Clemens, Pittsburg, Kan.
Vice-President Receiving Compensation—J. D. A. Morrow, Washington, D. C.
Secretary—W. B Reed, Washington, D. C.
Treasurer—J. J. Tierney, Philadelphia, Pa.

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Walter Barnum, New York City.
C. E Bockus, New York City.
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C. C. Dickinson, Charleston, W. Va.
T. W. Guthrie, Pittsburgh, Pa.
A. R. Hamilton, Pittsburgh, Pa.
Moroni Heiner, Salt Lake City, Utah.
F. C. Honnold, Chicago, Ill.
W. H. Huff, Denver, Col.
Geo. Heaps, Jr., Des Moines, Ia.
S. Pemberton Hutchinson, Philadelphia, Pa.
C. H. Jenkins, Fairmont, W. Va.
F. W. Lukins, Kansas City, Mo.
E. C. Mahan, Knoxville, Tenn.
A. J. Maloney, Chicago, Ill.
A. M. Ogle, Terre Haute, Ind.
J. G. Puterbaugh, McAlester, Okla.
R. M. Randall, Saginaw, Mich.
S. H. Robbins, Cleveland, Ohio.
W. J. Sampson, Youngstown, Ohio.
C. W. Taylor, Greenville, Ky.
H. N. Taylor, Kansas City, Mo.
J. J. Tierney, Philadelphia, Pa.
T. H. Watkins, New York City.
C. W. Watson, New York City (resigned); successor, F. W. Wilshire, New York City.
D. B. Wentz, Philadelphia, Pa.
S. L. Yerkes, Birmingham, Ala.
W. F. Megeath, Omaha, Neb.

DIRECTORS AT LARGE

John A. Donaldson, Pittsburgh, Pa.
W. H. Cunningham, Huntington, W. Va.
Philip H. Penna, Terra Haute, Ind.
Michael Gallagher, Cleveland, Ohio.

National Coal Association Takes Action to Prevent Coal Speculation

THAT the substantial coal operators throughout the country are determined on a policy that, in so far as their individual, voluntary effort within the law may permit, will prevent speculation in coal during the period of the present miners' wage controversy is evidenced by the following resolution unanimously adopted at the meeting last week of the association in the Congress Hotel, Chicago:

"Whereas, the National Coal Association earnestly desires to prevent speculation in coal, and it is the belief of the National Coal Association that wholesalers and retailers also are moved by a similar desire and wish,

"Now therefore be it resolved that the membership of the National Coal Association as well as all other coal producers, wholesalers and retailers throughout the country are hereby urged: (1) To demand of every purchaser of their coal that such billing be given as will guarantee the movement of coal so sold directly through to an actual coal consumer or to a dealer for retail distribution. (2) That every order taken shall state that the coal bought is for direct application to a consumer or retail dealer and that such billing will be provided, and that the coal when shipped will not be resold or reconsigned in speculative transactions."

Contrary to public opinion in some quarters, there is absolutely no difference of opinion between union and non-union coal operators with respect to the present imperative necessity of compelling contract observance by the miners and of seeking to guarantee that organized labor may not, by arbitrary or willful action, vacate the public right and the public interest, and that there must be acknowledgment by such organizations of the economic necessities of the entire people rather than the protection of privilege for a special class who apparently seem to be so placed strategically that they can compel public acquiescence in any extravagant or extreme policy that the labor organization may see fit to lay down.

Blizzard Acquitted of Treason Charge

WILLIAM BLIZZARD, president of Subdistrict 2 of District 17, United Mine Workers, charged with treason as one of the leaders of the armed march of miners on Logan County, West Virginia, last autumn, was found not guilty by a jury at Charlestown, Saturday night, May 27, after a few hours' deliberation.

This indictment was one of sixteen, including charges of murder, insurrection and conspiracy and invoking several hundred men, 120 of whom obtained a change of venue from Logan County to Jefferson County. When hearings of these cases began nearly five weeks ago, the treason charge was picked as the first for trial and Blizzard as the first defendant. Evidence in his case was begun just a month ago.

Railway Fuel Men Get Down to Bed Rock at Chicago

Convention Discusses Coal Economy from Many Angles—Coal Men Take Active Part—Peabody Says Third of Mines Will Be Bankrupted in 10 Years—Other Solutions for Coal Industry's Problems Presented

By E. W. Davidson

Bed rock was reached in practically every feature of the International Railway Fuel Association's 14th annual convention, which ran from Monday, May 22, until late in the afternoon of Thursday the 25th, at Chicago. A tremendous amount of valuable work along educational lines in fuel engineering held the close attention of more than 300 railroaders and coal men for eight long sessions. At the end more than one observer was moved to remark that the convention had been a most purposeful and intense assemblage. J. N. Clark, chief fuel supervisor of the Southern Pacific Lines, was elected president, succeeding W. L. Robinson, of the Baltimore & Ohio, who had proved himself a popular and capable leader. Next year the association will meet in Cleveland.

Part of the coal men's share of the program was reported in these columns last week but before the end of the convention several men of the industry contributed further. On Wednesday morning F. S. Peabody, chairman of the board of the Peabody Coal Co. of Chicago, with characteristic verve, declared that bankruptcy for one-third the bituminous coal industry within 10 years will lessen some of the ills of the trade. T. H. Watkins, president of the Pennsylvania Coal & Coke Co., speaking the following morning, took exception to some of Mr. Peabody's beliefs. Earl Cobb, president of the Southwestern Coal Co., made an effective address on the railroad economies of good quality coal. C. G. Hall, of Walter Bledsoe & Co., of Terre Haute, Ind., and C. E. Lesher, editor of this magazine, both spoke and Prof. H. H. Stoek, of the University of Illinois, read the year's report of the association on coal storage.

One of the concrete results of the association's practical work was the study of the effect of tonnage rating and speed on fuel consumption, in which a method was worked out and reported by J. E. Davenport, engineer of dynamometer tests of the New York Central, for determining the speed for any given weight of train at which coal consumption is most economical. Illustrating the interest which the association has been able to arouse among executives was the paper read by S. U. Hooper, a Baltimore & Ohio division superintendent, on "Fuel Conservation from the Standpoint of the Division Superintendent," and the address by L. W. Baldwin, vice-president of the Illinois Central, on "Fuel Conservation." Papers were read and addresses delivered on many phases of fuel economy viewed from many angles.

Railroads Object to Foreign Matter in Coal

A few peppery things were said by railroaders about the foreign matter that often is delivered to railroads by mines. One man told of finding a keg of miners' blasting powder delivered clear to a locomotive tender before it was discovered. Others complained of whole bucketfuls of bolts and washers, not to mention an overabundance of rock and slate in chunks that would break a stoker. C. F. Richardson, president of the West Kentucky Coal Co., reminded the railroad men that even though a mine operator's intentions may be good, his men constantly work in the dark, and anyway mine labor often is of low grade, making coal cleaning difficult to secure, but that it always pays a railroader to have inspectors on the job at the mine.

Ruthless competition is going to cure many of the ills of the coal industry, Mr. Peabody told the convention in a brisk and forceful address Wednesday morning. Not much can be done by any sort of agreement, either between miners and operators or among operators themselves, he declared.

"You hear a good deal about 'gentlemen's agreements,'" said he. "What do they amount to in businesses where competition is keen? Do you think I would put any particular confidence in the other 6,999 coal operators of the 7,000 in this country? A revision of the Sherman anti-trust law to permit any sort of agreements between coal operators in regard, for instance, to running time, would not accomplish anything beneficial. With the 7,000 operators mining under all sorts of varied conditions from Maryland to Washington it seems incredible that any sort of agreement could be arrived at and equally incredible that any agreement would be carried out even if it were made. Even if production could be restricted so as to distribute working time more evenly over the year and cut down idle day costs, thereby maintaining price levels high enough to guarantee a revenue to mine owners, the burden would only have been passed along to the public and nobody would be better off in the long run."

Mr. Peabody estimated the total loss to both capital and labor because of idle days at coal mines in this country is $400,000,000 a year. He arrived at this total after figuring on a capital investment of two billion dollars in mines, 700,000 men and boys employed, a mining capacity of one billion tons a year, a consumption normally of 500,000,000 tons and an average working time of 200 days a year, leaving 100 idle days.

"Based on these figures," said he, "and using the experience of my own mines as a guide, the estimated annual loss to capital on account of idle-day costs at all of the bituminous mines in the United States would be as follows:

Interest (at 6 per cent for 100 idle days)	$40,000,000
Labor and supply costs on idle days ($0.128 per ton on actual production, 1921)	51,968,000
Depreciation on 25-year life of mine	26,666,000
Taxes and insurance (0.013 on actual production, 1921)	5,278,000
Total idle day cost per annum	$123,912,000

After reviewing the well-known facts that coal-mine overdevelopment was partly the fault of railroads deliberately encouraging too many mines in order to get profitable freight and to keep coal prices down by competition, C. E. Lesher, editor of *Coal Age*, on Thursday discussed what should be done about it. If an attempt were made to solve the problem of overcapacity by a "labor trust" such as essays to keep down the number of miners in the hard-coal region, then there would be too few for periods of high demand, he said. This would certainly keep the price of coal up. Elimination of mines, he said, is the only other line of approach.

But who can select the mines to be eliminated and what rule could be followed? If the newer mines constitute the "overdevelopment" and were to be shut down, the cost of coal would mount 25 per cent, for the huge new operations ordinarily can mine coal most cheaply. Suppose running time were taken as a yardstick to measure the fate of mines. Those with the fewest days of operation per year would be tagged to go and those coming nearest to the ideal of 304 days a year would be encouraged to do more. The inexorable rule of nature would be approximated. Youth, vigor and low cost would survive. The aged and the weak would be ruthlessly scrapped. Truly, said Mr. Lesher, the theorist who tackles the job of selecting the doomed mines has his troubles ahead.

The association announced at the end of the convention that it had pulled itself out of the financial hole. The attendance was as large as that of any previous meeting of the association. In addition to President J. N. Clark, these officers were elected: Vice-presidents, M. A. Daly, of the Northern Pacific; P. E. Bast, of the Delaware & Hudson, and J. W. Dodge, of the Illinois Central; executive committeemen, Robert Collett, of the New York Central; O. J. Brown, of the Boston & Maine; T. Duff Smith, of the Canadian National Railways, and J. R. Evans, of the Chesapeake & Ohio.

Production and the Market

Weekly Review

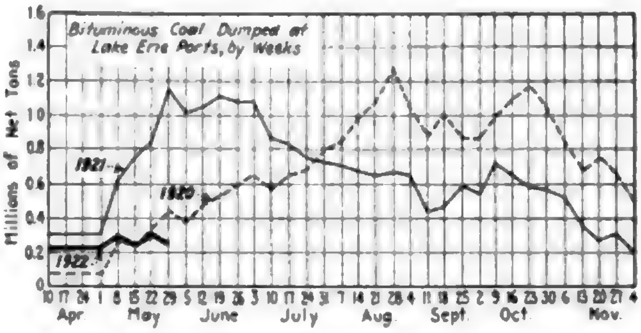
FOR the first time since the inception of the strike a definite break has occurred in the coal market. Prices, which had steadily climbed since April 1, suffered a marked decline during the past week. *Coal Age* Index of spot bituminous prices stands at 269 on May 29, a drop of 34 points from 303 on May 22.

Several factors are responsible for the radical change in the market. Following close on the heels of the price-stabilization parley in Washington between Secretary Hoover and a group of non-union producers came the announcement of freight rate reductions, amounting to 10 per cent, effective July 1. By the last week in May consumers reached the point of open revolt at stiffening prices. In the face of increasing production steel-mill buyers, protected for a reasonable period by their reserves, withdrew from the market. The Midwestern railroads have been perfecting their pooling arrangement and have ceased stirring up the market. Consequently general fuel purchases are now confined to emergency needs and many buyers who have the stocks for that period will stay out of the market until July 1 to obtain the benefit of the reduced freights.

QUOTATIONS FALLING IN FACE OF LIGHTER MARKET

The Connellsville coal market has flattened out with the removal of the Eastern demand and the withdrawal of steel-mill orders. Prices have dropped $1.50 in the last few days and operators are further reducing their quotations in the face of the lighter market. Receipts at New York, Baltimore and Philadelphia have increased materially and all quotations are much lower. Pier prices at Hampton Roads are down more than a dollar, enormous shipments are en route from the mines and the cessation of buying interest at coastwise points presages a difficult time in disposing of this tonnage. West Virginia spot prices broke late last week in nearly all districts.

The only sections where demand is sustained or has improved are in the Alabama field and in the Northwestern market. Emergency rates will soon be established from Alabama mines to points usually supplied from the Central Competitive Field. Inquiries are more numerous and while prices are unchanged there is a firmer tone noticeable. Docks at the Head-of-the-Lakes are experiencing a better demand with stiffening prices, as the Iron Range is taking more tonnage. Supplies will not last more than 90 days and out-of-territory shipments have aroused many regular dock customers to the advisability of at least laying in a small surplus.

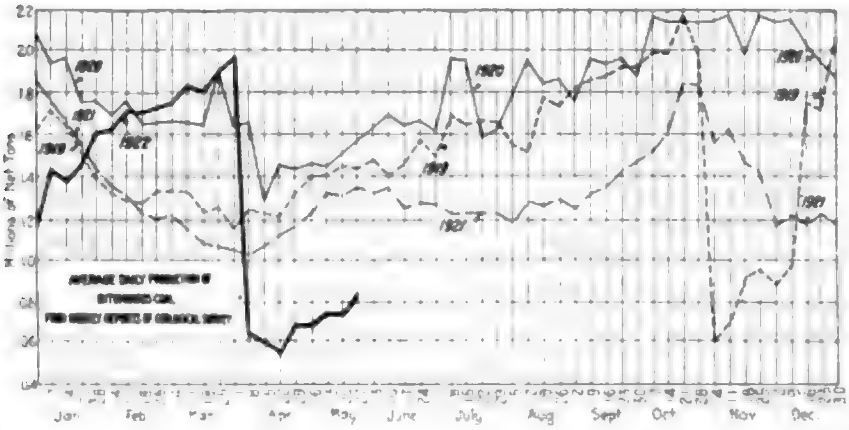


Production is showing a marked increase and while the coal is readily marketed, it is being sold under price and other conditions which make speculation difficult. Unbilled coal at the mines has been reduced to normal. At the closed union operations there are still a few cars on hand, but these are either held against contracts or are of the less-wanted grades.

BITUMINOUS

"The eighth week of the coal strike opened with a decided increase in production," says the Geological Survey. "The returns so far received indicate an output of soft coal close to 5,000,000 tons. Production of anthracite, however, remains practically zero.

"Final reports for the seventh week of the strike (May 15-20) show an output of 4,472,000 tons of bituminous coal and 8,000 tons of anthracite, a total of 4,480,000 tons. In



Estimates of Production

(Net Tons)

BITUMINOUS		
Week ended:	1922	1921
May 6 (b)	4,164,000	7,391,000
May 13 (b)	4,433,000	8,009,000
May 20 (a)	4,472,000	7,989,000
Daily average	745,000	1,332,000
Calendar year	157,600,000	150,540,000
Daily av. cal. yr	1,330,000	1,271,000
ANTHRACITE		
May 6	6,000	1,663,000
May 13	7,000	1,938,000
May 20 (a)	8,000	1,794,000
COKE		
May 13	96,000	69,000
May 20	100,000	72,000
Calendar year	2,594,000	3,061,000

(a) Subject to revision. (b) Revised from last report.

the corresponding week of 1920 the combined output of anthracite and bituminous coal was 11,090,000 tons, and a year ago our mines were producing 9,780,000 tons. Considering the anthracite and bituminous mines as a common supply of fuel, it will be seen that the quantity of coal now being raised is still more than 6,000,000 tons short of the weekly rate in a year of active business, and nearly 5,000,000 tons short of that in the year of depression, 1921.

"The increase during last week (May 22-27) may be judged from the fact that loadings on Monday exceeded by 652 cars the highest figure previously reported since the strike began. A further increase on Tuesday carried loadings above the 15,000-car mark, and the total for the first four days of the week exceeds by 11 per cent the corresponding period of last week. It is expected, therefore, that final returns will show an output not far from 5,000,000 tons.

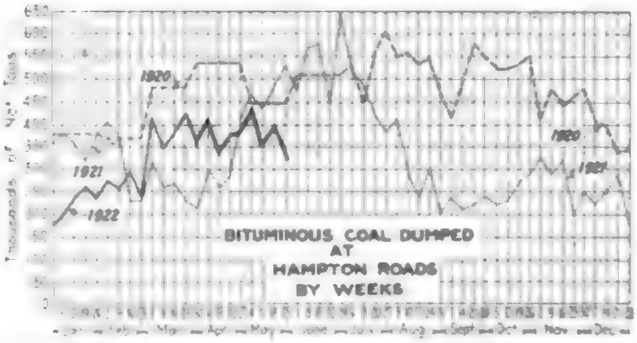
	1st week	3d week	4th week	5th week	6th week	7th week	8th week
Mon....	11,445	7,898	12,131	11,598	13,118	13,366	14,688
Tues ...	11,019	10,041	12,377	12,160	13,266	12,830	15,026
Wed ...	11,437	11,088	12,622	12,861	13,445	13,422	14,684
Thurs....	11,090	11,193	12,981	12,487	13,266	13,445	14,612
Fri....	11,296	11,596	12,362	12,778	13,727	14,036	....
Sat....	8,888	10,194	11,295	11,265	11,454	12,357	....

"The increase is largely in response to higher prices and more active demand, calling into production mines which have hitherto been working only part time in the districts not affected by the strike. To a much smaller extent the increase results from resumption of work at mines at first closed by the strike in eastern Kentucky and southern West Virginia. Shipments are increasing slowly out of the Connellsville coke region and the Kanawha and New River fields. The region to furnish the greater part of the increase in output is the Middle Appalachian, where the mines are rapidly approaching maximum production."

Lake dumpings were 249,866 net tons during the week ended May 29—239,650 tons cargo and 10,216 vessel fuel—as compared with 308,692 tons in the preceding week. Dumpings for the season to date are 1,955,926 tons; in 1921 they were 4,816,486 tons. About 1,500 cars daily are moving to the lower ports, but much of the tonnage is being transshipped to Buffalo and but little is going to the upper docks. The Buffalo market is losing much of its insistency, however. Up to May 1 this year about 109,000 tons were shipped to that port for the use of coke and steel plants. In 1920 only 1,000 tons went to this market.

All-rail movement to New England declined to 496 cars during the week ended May 20, the lowest record for any week since the miners' strike in 1919. During the coal year ended March 31 New England received 18,356,000 net tons, of which 8,095,000 came via the all-rail route. The total receipts were practically 4,000,000 tons less than during the previous year and 700,000 less than in the 1919-1920 coal year. The feature of the coal trade was the increasing percentage obtained by Tide.

Hampton Roads dumpings declined to 328,030 tons during the week ended May 25 from 400,756 in the preceding week.



There is a heavy and growing accumulation at the piers, while marine freights are wobbling.

ANTHRACITE

Production remains practically at the zero mark, aside from a small tonnage of steam sizes dredged from the rivers. Absolute stagnation prevails in the retail trade. The freight reduction and the wage offer embodying a 21-per cent cut assure the consumer that he has but to bide his time to obtain cheaper fuel. Pea is the only domestic size that remains plentiful, both at retail and mine storage points. Buckwheat No. 1 is moving better and is now the only steam storage coal that is easily available. Prices on this size are slightly higher.

COKE

Beehive coke production continues to increase slowly. Output during the week ended May 20 was 100,000 net tons, as compared with 96,000 tons in the previous week. The chief factor in the increase was the greater activity in the Connellsville region. Furnace coke prices have increased sharply, due largely to buying on the part of one steel

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

	Market Quoted	May 1, 1922	May 15 1922	May 22 1922	May 29, 1922†
Low-Volatile, Eastern					
Smokeless lump	Columbus	$3.05	$2.85	$3.65	*$3.50@$3.65*
Smokeless mine run	Columbus	2.40	2.90	3.30	**3.25@3.50**
Smokeless screenings	Columbus	1.75	2.90	3.25	3.00@3.50
Smokeless lump	Chicago	2.75	2.90	2.75	**3.25@3.50**
Smokeless mine run	Chicago	1.95	2.70	2.75	**3.00@3.25**
Smokeless lump	Cincinnati	2.90	3.25	3.50	*3.25@3.50*
Smokeless mine run	Cincinnati	2.15	2.90	3.25	*3.00@3.25*
Smokeless screenings	Cincinnati	2.15	2.75	3.15	*3.00*
*Smokeless mine run	Boston	5.05	6.75	7.35	*6.00@6.25*
Clearfield mine run	Boston	2.60	3.25	3.75	*3.00@3.25*
Cambria mine run	Boston	3.00	3.75	4.25	*3.50@3.75*
Somerset mine run	Boston	2.80	3.50	3.65	*3.25@3.50*
Pool 1 (Navy Standard)	New York	3.75			
Pool 1 (Navy Standard)	Philadelphia	3.70	3.95	4.75	
Pool 1 (Navy Standard)	Baltimore	3.75	4.00		
Pool 9 (Super. Low Vol.)	New York	3.25	4.00		*3.65@4.00*
Pool 9 (Super. Low Vol.)	Philadelphia	3.30	3.75	4.65	*3.25@4.00*
Pool 9 (Super. Low Vol.)	Baltimore	3.40	4.00	4.75	*3.15@3.40*
Pool 10 (H. Gr. Low Vol.)	New York	3.00	3.75	4.90	*3.55@3.75*
Pool 10 (H. Gr. Low Vol.)	Philadelphia	3.15	3.60	4.75	*3.00@3.50*
Pool 10 (H. Gr. Low Vol.)	Baltimore	3.25	3.75	4.75	*3.15@3.40*
Pool 11 (Low Vol.)	New York	2.75	3.65	4.65	*3.15@3.40*
Pool 11 (Low Vol.)	Philadelphia	2.80			*2.50@3.00*
Pool 11 (Low Vol.)	Baltimore	3.10	3.50	4.75	*3.00@3.15*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	2.70			*3.00@3.25*
Pool 54-64 (Gas and St.)	Philadelphia	2.50		3.40	*2.50@3.00*
Pool 54-64 (Gas and St.)	Baltimore	3.00		4.00	*3.00*
Kanawha lump	Columbus	2.90	3.15	3.60	*3.40@3.50*
Kanawha mine run	Columbus	2.65	3.00	3.25	*3.15@3.35*
Kanawha screenings	Columbus	2.00	2.95	3.35	*3.00@3.25*
W. Va. Splint lump	Cincinnati	2.75	3.10	3.40	3.25@3.50
W. Va. Gas lump	Cincinnati	2.75	3.00	3.65	*3.10@3.50*
W. Va. mine run	Cincinnati	2.40	3.00	3.40	*3.00@3.25*
W. Va. screenings	Cincinnati	2.20	2.90	3.25	*[illegible]@3.25*
Hocking lump	Columbus	3.05	3.15	3.90	*3.50@3.75*
Hocking mine run	Columbus	2.90	2.90	3.65	*3.50@3.60*
Hocking screenings	Columbus	2.15	2.85	3.50	**3.50@3.[illegible]**
Pitts. No. 8 lump	Cleveland	3.25	3.25	3.90	
Pitts. No. 8 mine run	Cleveland	$2.90	$3.25	$3.90	*$3.00@$3.50*
Pitts. No. 8 screenings	Cleveland	2.90	3.25	3.90	*3.00@3.50*
Midwest					
Franklin, Ill. lump	Chicago	3.45	3.95		
Franklin, Ill. mine run	Chicago	3.00	3.95		
Franklin, Ill. screenings	Chicago	3.00	4.15		
Central, Ill. lump	Chicago	2.75			
Central, Ill. mine run	Chicago	2.75			
Central, Ill. screenings	Chicago	2.00			
Ind. 4th Vein lump	Chicago	3.15			
Ind. 4th Vein mine run	Chicago	2.50			
Ind. 4th Vein screenings	Chicago	2.25			
Ind. 5th Vein lump	Chicago	2.60			
Ind. 5th Vein mine run	Chicago	2.60			
Ind. 5th Vein screenings	Chicago	2.40			
West. Ky. lump	Louisville	2.60	3.15	3.25	*3.10@3.35*
West. Ky. mine run	Louisville	2.60	3.15	3.25	*3.10@3.35*
West. Ky. screenings	Louisville	2.60	3.15	3.25	*3.10@3.35*
West Ky. lump	Chicago			3.60	*3.00@3.25*
West Ky. mine run	Chicago			3.60	*3.00@3.25*
South and Southwest					
Big Seam lump	Birmingham	2.00	2.00	2.00	
Big Seam mine run	Birmingham	1.70	1.70	1.70	
Big Seam (washed)	Birmingham	1.85	1.95	1.85	
S. E. Ky. lump	Chicago			3.65	*3.00@3.25*
S. E. Ky. mine run	Chicago			3.50	*3.00@3.25*
S. E. Ky. lump	Louisville	2.75	3.15	3.90	[illegible]
S. E. Ky. mine run	Louisville	2.75	3.00	3.40	[illegible]
S. E. Ky. screenings	Louisville	2.75	3.00	3.40	[illegible]
S. E. Ky. lump	Cincinnati	2.90	3.00	3.50	[illegible]
S. E. Ky. mine run	Cincinnati	2.40	3.00	3.50	[illegible]
S. E. Ky. screenings	Cincinnati	2.25	3.00	3.25	[illegible]
Kansas lump	Kansas City	4.25	4.25	4.25	*4.00@4.50*
Kansas mine run	Kansas City	4.15	4.15	4.15	**4.00@4.40**
Kansas screenings	Kansas City	2.65	2.65	2.65	**2.[illegible]@2.35**

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in heavy type, declines in *italics*.
NOTE—Smokeless prices now include New River and Pocahontas.

How the Coal Fields Are Working

Percentage of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Apr. 1, 1922 Inclusive	Apr. 3 to May 13, 1922 Inclusive	Week Ended May 13
U. S. Total	45.6	55.7	....	....
Non-union				
Alabama	63.5	64.6	71.9	76.3
Somerset County	55.5	74.9	58.1	22.7
Panhandle, W. Va.	55.3	51.3	37.4	44.9
Westmoreland	54.9	58.8	69.2	74.6
Virginia	54.8	59.9	73.3	83.8
Harlan	53.3	54.8	46.6	56.6
Hazard	51.7	58.4	57.9	64.0
Pocahontas	49.8	60.0	74.0	82.5
Tug River	48.1	63.7	78.2	87.0
Logan	47.6	61.1	70.8	77.8
Cumberland-Piedmont	46.6	50.6	13.0	18.2
Winding Gulf	45.7	64.3	67.8	76.2
Kenova-Thacker	38.2	54.3	76.0	85.9
N. E. Kentucky	32.9	47.7	58.1	62.3
New River‡	24.3	37.9	9.2	11.3
Union				
Oklahoma	63.9	59.6	15.1	12.0
Iowa	57.4	78.4	0.0	0.0
Ohio, eastern	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	0.6	0.5
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	10.7	11.0
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	11.5	11.5
Fairmont	35.3	44.0	4.3	5.4
Western Kentucky	32.5	37.7	46.0	75.2
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	1.7	3.8
Ohio, southern	22.9	24.3	0.0	0.0

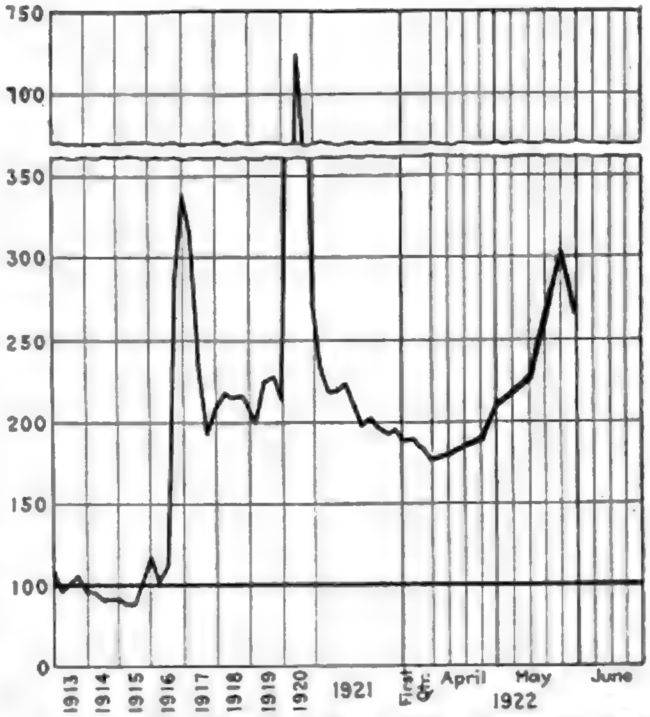
* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

works' furnace whose regular source is on strike and which it is desired to put in blast at once.

Creech Coal Co. Denies That Henry Ford Has Purchased Two of Its Mines

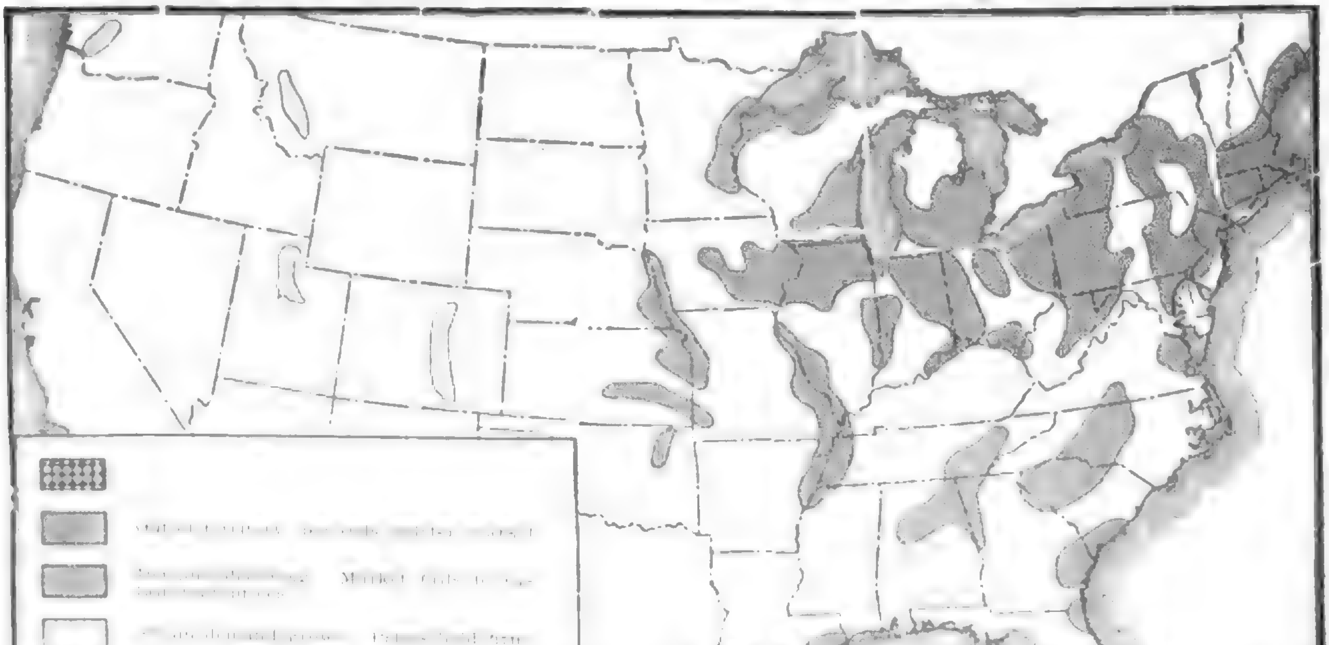
The Creech Coal Co. has issued a denial of the recent rumor that the Henry Ford interests have purchased additional mines on Wallins Creek, Harlan County, Kentucky, within a short distance of the Banner Fork operation, which Mr. Ford purchased a year or so ago. The two mines in question are at Twila and Low. It is known that Mr. Ford has been dickering for this property for some time, but the holders refuse to sell at the price offered.

Mr. Ford has made many improvements in the Banner Fork mine, making it one of the most modern operations in Harlan County. Soon after he acquired the Banner Fork property the union attempted to dictate a policy to Mr. Ford, who promptly advanced his wage scale, with the result that his men abandoned the union. Because of the higher wages offered at the Banner Fork mine—$1 per hour for a 10-hour day, against a union scale of $8.44 for eight hours—the Creech mines were placed at a disadvantage and have not been operated for some time, while the Ford property is running full time.



Coal Age Index 269, Week of May 29, 1922. Average spot price for same period $3.26. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh District, Illinois and Indiana prices not included in figures for last week.)

Relative Activity of Markets for Bituminous Coal at End of Eighth Week of Strike



Foreign Market And Export News

April Exports Curtailed by the Strike

Exports of bituminous coal during April were greatly curtailed by the strike, 714,995 tons being shipped, as compared with the March figure of 1,187,313 tons and 1,443,091 tons in April, 1921. The only increase, in comparison with April of last year occurred in shipments to the West Indies, Panama and Cuba group. The figures, compiled by the Bureau of Foreign & Domestic Commerce, are as follows:

APRIL EXPORTS AND IMPORTS

(Gross Tons)

	April 1921	April 1922
Exports, bituminous coal:		
By rail to		
Canada	726,093	453,406
Mexico	8,289	16,217
Total	734,382	469,623
By vessel to		
West Indies	26,805	36,956
Panama	19,829	9,390
Cuba	28,346	47,144
Total	74,980	93,490
France	30,513	.....
Italy	170,364	57,426
Sweden	3,470	.....
Denmark	5,571	.....
Total Europe	209,918	57,426
Argentina	61,175	.....
Brazil	90,999	38,864
Chile	5,413	14,908
Total South America	157,587	53,772
Egypt	57,734	11,226
Other countries	208,490	29,458
Total bituminous	1,443,091	714,995
Total anthracite	368,534	109,290
Total coke	18,863	28,413
Imports, bituminous coal.		
Imported from:		
United Kingdom	.....	16,095
Canada	80,327	43,597
Japan	.....	100
Australia	8,873	8,146
Other countries	4	757
Total bituminous coal	89,204	68,695
Total anthracite	2,638	1,391
Total coke	1,629	432

British Get Heavy German Orders

British production, as cabled to *Coal Age*, was 4,945,000 gross tons during the week ended May 13, as compared with 4,765,000 tons in the preceding week. The price trend seems to be downward, although the export market is still active.

Germany has recently purchased 1,000,000 tons of East Coast coals. It is believed that these orders were placed largely for Hugo Stinnes. Shipment extends up to August. The Berlin Gas Works Co. has contracted for 200,000 tons of second Durham gas coals at 21s. 6d. per ton f.o.b., delivery over the same period.

Export Clearances, Week Ended May 25, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Nor. S.S. Ravnanger, for Fort de France	4,925
For Cuba:	
Nor. S.S. Christian Michelsen, for Havana	5,570
For Italy:	
Nor. S.S. Vulcano	8,000

IMPORTS OF COAL in 1913 totaled 1,578,264 tons; in 1918 the total was 1,300,958 tons; in 1919, 903,170 tons; in 1920, 1,111,598 tons; in 1921, 1,122,847 tons. These figures have just been assembled by the Department of Commerce at the request of the Finance Committee of the Senate, which is piloting the tariff bill through the upper house.

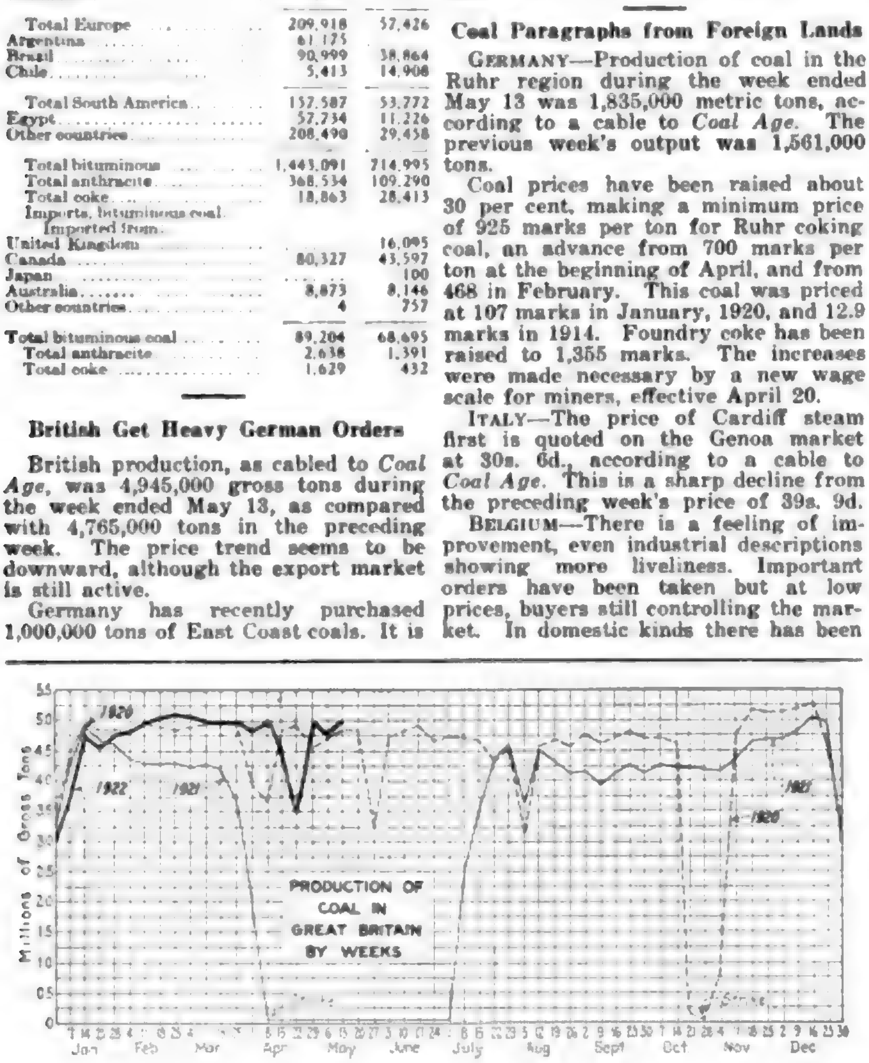
Coal Paragraphs from Foreign Lands

GERMANY—Production of coal in the Ruhr region during the week ended May 13 was 1,835,000 metric tons, according to a cable to *Coal Age*. The previous week's output was 1,561,000 tons.

Coal prices have been raised about 30 per cent, making a minimum price of 925 marks per ton for Ruhr coking coal, an advance from 700 marks per ton at the beginning of April, and from 468 in February. This coal was priced at 107 marks in January, 1920, and 12.9 marks in 1914. Foundry coke has been raised to 1,355 marks. The increases were made necessary by a new wage scale for miners, effective April 20.

ITALY—The price of Cardiff steam first is quoted on the Genoa market at 30s. 6d., according to a cable to *Coal Age*. This is a sharp decline from the preceding week's price of 39s. 9d.

BELGIUM—There is a feeling of improvement, even industrial descriptions showing more liveliness. Important orders have been taken but at low prices, buyers still controlling the market. In domestic kinds there has been a slight slackening in demand owing to the mild weather. Export orders for domestic descriptions are still numerous.



SPAIN—The Central Hullera de Asturias has fixed the following prices for coke and briquets: Furnace coke, 40 pesetas, free on truck, briquets, 50 pesetas.

Topheavy Supplies at Hampton Roads

Sudden dullness featured the market last week. Dumpings at all piers were reduced and prices cut down 75c.@$1. This is due to the uncertainty which hangs on the investigation by Secretary Hoover.

The Lambert's Point Piers showed for the month a better total than the other two piers combined. Export business was reduced to the minimum with shipments to coastwise points noticeably cut down.

Inquiries have practically ceased, while few quotations are being made, consumers having withdrawn from the market to all appearances. The announced reduction in freight rates had little effect here, since the drop is only about 29c. or 30c. per ton.

Hampton Roads Pier Situation

	—Week Ended— May 18	May 25
N. & W. Piers, Lamberts Point:		
Cars on hand	1,506	3,242
Tons on hand	81,382	163,195
Tons dumped	177,348	149,582
Tonnage waiting	20,000	30,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	929	1,667
Tons on hand	46,450	83,350
Tons dumped	118,764	84,488
Tonnage waiting	20,442	26,250
C. & O. Piers, Newport News:		
Cars on hand	793	1,454
Tons on hand	39,650	72,700
Tons dumped	61,706	58,814
Tonnage waiting	9,200	7,915

Pier and Bunker Prices, Gross Tons

PIERS

	May 20	May 27†
Pool 9, New York	$8.00@$8.35	*$7.[illegible]@$7.60*
Pool 10, New York	8.00	*7.00@7.25*
Pool 9, Philadelphia	7.15@7.50	*6.75@7.00*
Pool 10, Philadelphia	6.95@7.45	*6.50@6.75*
Pool 71, Philadelphia	7.45@7.70	*7.00@7.25*
Pool 1, Hamp. Rds.	7.00@7.25	*6.00@6.25*
Pools 5-6-7 Hamp. Rds.	7.00@7.25	*6.00@6.50*
Pool 2, Hamp. Rds.	6.75@7.00	*6.00@6.20*

BUNKERS

	May 20	May 27†
Pool 9, New York	$8.20@$8.50	*$7.60@$7.80*
Pool 10, New York	8.25	*7.35@7.55*
Pool 9, Philadelphia	7.40@7.65	*7.05@7.35*
Pool 10, Philadelphia	7.25@7.55	*6.80@7.00*
Pool 1, Hamp. Rds.	7.25	*6.25@6.50*
Pool 2, Hamp. Rds.	7.00	*6.25@6.50*
Welsh, Gibraltar	43s. f.o.b.	43s. f.o.b.
Welsh, Rio de Janeiro	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Welsh, Lisbon	43s. f.o.b.	43s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	43s. t.i.b.	43s. t.i.b.
Welsh, Messina	41s. f.o.b.	41s. f.o.b.
Welsh, Algiers	41s. f.o.b.	41s. f.o.b.
Welsh, Pernambuco	65s. f.o.b.	65s. f.o.b.
Welsh, Bahia	65s. f.o.b.	65s. f.o.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Malta	44s. 6d. f.o.b.	44s. 6d. f.o.b.
Welsh, Las Palmas	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Port Said	51s. 6d. f.o.b.	51s. 6d. f.o.b.
Alexandria	43s.	43s.
Capetown	35s. 3d.	35s. 3d.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

	May 20	May 27†
Cardiff:		
Admiralty, Large	28s. 6d.@28s. 9d.	*27s. 9d.@28s.*
Steam, Smalls	19s.@20s.	*18s. 6d.@19s.*
Newcastle:		
Best Steams	23s.	**23s. 6d.@24s.**
Best Gas	23s.@24s.	[illegible]
Best Bunkers	22s. 6d.	**22s. 6d.@23s.**

† Advances over previous week shown in heavy type; declines in *italics*.

North Atlantic

Rush Demand Ends Abruptly; Railrods First to Withdraw

Since Price Conference, Purchases Are for Emergencies—Events of Week Relegate Rate Decision to Background—If Able, Buyers Will Hold off Till Cut Is Effective.

SHARP price declines featured the past week. The Washington conference doubtless was the factor which caused the abrupt withdrawal of consumer demand. The first easing came from the railroads, which apparently had reached their price limit. Emergency purchases are the rule today but the number of these are increasing as consumers are gradually faced with the necessity of placing orders for current needs.

Anticipated as the announcement of the freight reduction was, its importance was discounted further by the strenuous events of the week's coal market. There is no doubt, however, that consumers whose reserves will stand the drain will stay out of the market until they can avail themselves of this reduction after July 1.

NEW YORK

The belief that coal prices might be "Garfieldized" together with the freight reduction has had its effect upon the situation. The easing off of quotations continues. There is considerable fluctuation, however, quotations changing frequently.

The low prices have failed to arouse any enthusiasm among the buyers. With most of the coal that was on tracks around April 1 marketed some producers looked for a stiffening of prices by the middle of the week. On May 26 there were nearly 1,800 cars at the piers but there were said to be orders on hand that would reduce this number by 500. Considerable of this coal was said to be unclassified and wagon mine product.

Loaded boats were quoted as low as $6.50, alongside, but the better grades were quoted $7.25@$7.55. High-volatile Pittsburgh coals were quoted $2.90 @$3.25.

Southern coals continue to come forward in good volume on a basis of $6@$6.25, Hampton Roads. The boat rates range from 85c. for small boats to $1.20 for steamers. Another of the large railroads is said to be following in the footsteps of the Lackawanna and is buying considerable Southern coal.

CENTRAL PENNSYLVANIA

A slight increase in production was reported during the eighth week of the strike, when 2,851 cars were loaded, compared with 2,823 the week previous. Gains are reported at Revloc where 110 miners have returned to work. A loss is reported at the Reading mines at Stoyestown, Somerset County, where more than 100 miners quit on May 24.

Unsold cars in the field dropped during the week from 900 to 800 and prices for high-grade low-volatile coal dropped 50c.@75c. and now range $3.25 @$3.50. A leading operator of the district, with mines in northern Cambria County, whose mines have been in operation, is authority for the statement that the miners are getting tired of the delay and are becoming anxious to return to work.

PHILADELPHIA

Soft coal has gone through a week of muddled conditions. The proposed freight reduction feature seemed to have no effect whatever on the trade. The movement of prices was the stirring feature, there being at one time a sudden drop of $1@$1.50 on spot coal. One leading shipper characterized it as another buyer's strike, as the big consumers seem to let down in their efforts to get coal all at once. It has been a question from the first just how far the heavy users would, or could go, and $5 seems to have been the limit.

The first easing off seems to have come from the railroads, who when coal was offered around $4, ceased buying. This left a considerable amount of coal free and the smaller consumer was solicited strongly to buy, but even here there were few sales. However, the best judgment would seem to dictate that with weekly production only moderately increased and consumption going ahead, there is liable to be an early re-action to higher figures.

High-grade coals, especially Pool 1, continued to be hard to find, even though prices did drop, and it was the coals in Pool 11 and lower, together with the unclassified, that was mostly to be had.

An odd feature is that despite the generally admitted softening of prices, there is still a good sprinkling of quotations at $5@$5.50. Some very small producers evidently are figuring that the sagging market is only to be of short duration, and continue to offer a single car at top figures.

BALTIMORE

There can be no doubt that the Hoover move to keep down the prices is at least temporarily successful. At this writing some operating interests are offering lower grade coals around $3, while good grades are running $3.15 @$3.40 for the most part. There is practically no first grade coal in the market, except some of the Navy Standard coal reaching here by barge from Hampton Roads.

The success of the effort to drive down the price of coal was undoubtedly due to the fact that a number of consumers who were very actively in the field for supplies have become convinced that they are to get cheaper coal. No matter what the decision in Washington it will probably take some days at least before the situation shakes itself down to a practical basis. On top of this quite a few consumers who can afford to hold off until after July 1 will undoubtedly do so to get the benefit of the ten per cent cut in rail rates.

Meanwhile the majority of operators are standing fast and not a few with coal to sell are refusing to meet the present cut in prices to as low as $3.

FAIRMONT

Production in the Fairmont region was fluctuating somewhat during the seventh week of the strike but it was larger than during the preceding week. There were at least 128 mines working, substantial gains being made in the number of mines at work on the Monongah Division of the B. & O., although there were more mines running on the Charleston Division than on any other road. Demonstrations against non-union miners and attacks upon them were becoming somewhat more numerous and there was also some destruction of property.

UPPER POTOMAC

There was comparatively little change in conditions in the Upper Potomac during the seventh week of the strike except as to prices, there being less snap to the market than has heretofore been witnessed. Where conditions connected with the strike permitted, mines were being operated to capacity and production was on a little larger scale.

West

DENVER

With a scanty supply of slack in the state, partly on account of increased demand for lump coal and also because of lack of production caused by strike conditions, many operators are screening slack from mine run and are also crushing the mine run coal in order to supply their contracts. The slack price ranged $2@$2.50 per ton; lump, $5; nut, $4.50 and mine run, $3.50.

The greater part of the Canon City district is shut down on account of the strike and little change is shown at other points in the state.

KANSAS CITY

Though domestic demand is dead steam plants are getting anxious and are buying most any grade that will make steam and some of them are putting in oil burners to tide over. One of the pumping stations of the Kansas City water department has been equipped with oil burners but as soon as coal of the right grade is available, the plant will change back to coal.

Colorado mines are running fairly well as no apprehension over a coal shortage is felt by the wheat threshers, who in the past have used part Kansas coal and part Colorado.

SALT LAKE CITY

The demand for slack only has picked up some as a result of industrial activity. Some operators who dumped their slack some time ago are trying to recover it. Other grades are moving very slowly and if things do not improve it is feared in some quarters that operators will experience considerable difficulty in finding places to put coal.

There is no change in the Coast trade. It is expected to improve as soon as the I. C. C. approves the reduction in freight rates offered by the carriers.

Anthracite

Retail Trade Stagnant; Rate Cut Halts Stocking

Waiting Game Predicted Also on Deferred Wage Settlement—Pea Still Plentiful in Yards—Buckwheat Moves Better—Steam Sizes of River Coal Perk Up.

STAGNATION prevails in the retail trade. What little stocking had been going on was brought to an end by the announced freight reductions, effective July 1. The consumer is assured that he has but to bide his time and his winter's fuel costs will be reduced. The recent offer of a 21 per cent cut in wages further determines this course of action. Yard stocks of pea are still heavy, while the domestic sizes could not stand even a short period of active buying.

Buckwheat is moving better and companies are cutting heavily into their tonnage. Sales of river coals of steam sizes are picking up as the scarcity of steam grades grows more pronounced.

NEW YORK

There is no demand and it is not now expected there will be any until early fall. The refusal of the miners to meet the operators' wage proposals has had no effect upon the public mind. Coal is growing scarcer, with the exception of pea size which moves slowly.

Even with the three large sizes disappearing there is an abundance of pea coal which some consumers may be glad to utilize before the mines resume.

Buckwheat is moving better and some producers are cutting into their reserve stocks. With this size out of the way it may be possible that the reserve stocks of pea will be taken.

Rice coal is moving nearly as well as buckwheat and is growing scarcer. Regular barley is hard to get but river product is easily picked up. Quotations for buckwheat in boats ranged $6.25@$6.75, alongside, and for rice $5.75@$6.25. River barley is being quoted around $1.50 f.o.b. at point of shipment.

PHILADELPHIA

Unlocking the office door in the morning and reversing the process in the evening is about all the action there is in the retail trade. Even the slight ordering for winter that has been apparent lately has dwindled away in the face of the two most important happenings of the season in the trade. These events were the freight-rate reduction, and the wage reduction offered to the miners. The public believes it will get the benefit of both, and that coal will surely be cheaper some time before it is needed again.

The freight reduction reduced to money means only 30c. to 40c. a ton, and a wage reduction is reported to mean about 80c. a ton cut on production, and only a part of this latter may reach the retailer at all. The retail men are looking forward to a time of much explanation to the consumer when he comes a-buying once more.

A rumor has been abroad recently that with the resumption of mining there will be an entirely new arrangement of sizes. The story goes that by re-sizing, the mine prices will be so adjusted as to show quite an appreciable reduction to the consumer, with no loss of return to the operators. The operators have a committee on re-sizing and are almost weekly considering this proposition.

With buckwheat the only size remaining in the steam market, there has been an appreciably stronger demand for this coal. There is some complaint that this storage coal is running dirty, yet despite this the demand grows and even the price has increased in certain instances, with numerous sales at $3.75.

BUFFALO

The trade is much smaller than one would expect. Consumers do not ask for coal in any amount. The lack of business in the anthracite offices is becoming rather distressing. It would seem that the stock of stories that has been passing from lip to lip among the workers there is about exhausted, for report has it that the clerks will be put on half time in some cases before long. Dock men are kept together as well as possible by repair work and odd jobs. If the Lake fleet was running actively the men would scatter in that direction, but so far only grain is moving rapidly.

For awhile there was independent anthracite in some amount held by the operating companies, but that is said to be gone. It sometimes found purchasers at as high as $2 premium, but most of it sold for about 75c. extra.

BOSTON

In domestic sizes at wholesale there is scarcely a wheel turning. Remaining reserves are being worked off and there is small likelihood of any of the companies losing prepaid freight on storage coal by reason of the 10 per cent reduction in rates. The larger companies have disposed now of practically all the sizes in stock except pea and buckwheat.

For pea there is only a moderate and scattering request. A few cargoes have been placed here, but retailers are not inclined to increase their supplies.

ANTHRACITE FIELDS

The effect of the strike is now spreading to other industries in the hard coal region. It is estimated that retail sales in Scranton have fallen off more than 25 per cent and are steadily dropping further.

Those men who are now working are to be assessed one day's pay per month to help defray the expenses of the negotiations being carried on in New York. Before the strike an assessment of $1 was made for this work. As there are supposed to be 100,000 men in the region the costs of the negotiations are proving to be very heavy.

BALTIMORE

Slowly, because there is little demand, the small reserve is being wiped out. The entire reserve in yards of this city probably is not greater than 7,000 tons. The public does not seem to be at all disturbed about the situation, however, and the cut in freight rates is adding to the thought that the basis of prices will be lower when coal begins to run again.

Coke

UNIONTOWN

Hoover's price stabilization plan broke the coal market early this week, when many steel interests withdrew buying orders. Demand as the week closes is none too strong but the tonnage produced is selling at $3.25@$3.50.

The possibility of price stabilization undoubtedly was the cause of the market break and indicates that there was not so much a demand for coal as there was fear on the part of consumers that the price would go still higher. Most of the buyers are steel interests, and while many withdrew buying orders, there are yet enough to absorb all tonnage offered for sale.

The present market will mark the end again of the wagon mines. About 75 of such mines had opened since the strike commenced but the present prices are about equal to their cost of production.

CONNELLSVILLE

Furnace coke has undergone a sharp advance, attributed largely, if not wholly, to buying for account of a steel works furnace at Monessen whose regular source of supply is on strike and which it is desired to put in blast at once. No market for foundry has been fully established as yet, the few inquirers hesitating about making purchases on account of advanced prices. The market in general may be quoted about $7@$7.25 for furnace and $7@$7.50 for foundry.

The average merchant furnace interest continues strictly out of the market, asking prices being far above what the furnaces could afford to pay, in view of the low priced sales of pig iron. The steel industry is obtaining its coke by various devices, and there are large drafts upon non-union fields for byproduct ovens.

The *Courier* reports production during the week ended May 20 at 43,500 tons by the furnace ovens, and 13,930 tons by the merchant ovens, a total of 57,430 tons, an increase of 3,280 tons. Production in the week ended April 1 was 149,600 tons and in the low week, ended May 6, 52,200 tons.

BUFFALO

The trade is exceedingly dull, for the big furnaces have byproduct ovens and they are running so actively that the gas furnished for city use is said to be in large quantity. The furnaces are running at a pretty good rate and are offering considerable iron to the canal barges for Tidewater. Coke quotations remain on the basis of $7 for best 72-hr. Connellsville foundry, and $6 for 48-hr. furnace.

by Google

Chicago and Midwest

Sharp Break in Prices Marks Week in Midwest

Western Kentucky Shows Steepest Drop on Most Western Markets—Gets As Low As $3—Railroad Pool Working Well Thus Far.

THE swift fall of Western Kentucky which struck Chicago early last week after a day or two of wild wobbling, was the most striking feature of the Midwestern coal situation during the past 10 days. The fields are doing their best to prevent a crash to rock bottom and wisest observers say there is no collapse coming. But coal which sold heavily throughout the West for $3.65@$3.75 about May 20 went down to a flat $3 in some markets and is expected to go a little below that with an eventual return to about that figure or a few cents above for a run of indefinite length.

The main drive to hold western Kentucky down was made from Chicago where the railroad buying pool centers its activities, but there were distinct evidences in St. Louis and other markets as well. Meantime, operators in the fields involved complain that they are being penalized by powerful interests from union fields now closed down. These "powerful interests" have contracts to fill or they would not be so altruistically active in trying to keep coal costs down for the benefit of the country, the Kentuckians assert as they note the withdrawal of competing northern and eastern purchasing agents from their midst. The fact that many of them are wiring to the markets for bids on their output plainly indicates the turn buying in the field has taken in the past few days.

The coal buying committee of the railroads continues to smooth out its difficulties and is taking on a considerable tonnage for its many participants. However, it is not buying the enormous volume of coal that was originally anticipated because only within the last day or two has it found prices to its liking. The maximum price of $3.25 which the pool was said to have fixed a week ago has been undercut in several instances and it is now understood that a new level will be adhered to as long as possible.

Business generally has shown no tendency to boom though a cautious betterment continues to be noted, and the partial assurance of a coal supply which the coal committee for the railroads has given to important fuel consumers encourages this slight improvement. Retail trade is dead and many yards are heavily stocked. Around Chicago retail interests continue to warn the public that coal is bound to go up and that now is the time to stock for next winter.

CHICAGO

The steep fall in prices of all coals during the past week has reduced trading on this market to a certain "normalcy" which brings joy and sorrow to the hearts of buyers and brokers respectively. The descent of western Kentucky from a strong $3.65 began at the first of last week and ran down to a flat $3 on Saturday with speculation absolutely sponged off the map. When Kentucky mines wired here for offers, the town knew the buying rush was ended. The days of shipping coal to Chicago on open consignment apparently are over for the present. One or two big jobbers have made money for a month, but the majority have been burned badly since the organization of the railroad buying pool with the associated effort on the part of operators to keep the trade informed every day of the exact number of cars of coal reaching this market without buyers.

"We're getting back to a healthier basis," commented a well-informed coal man, "and I hope we can hold the trade there for awhile. The probabilities are we will be successful for at least 30 days. But if there is no settlement of the strike in definite prospect by July 1 or pretty soon thereafter, it certainly will be hard to control competitive bidding for coal. A good many big consumers will be worrying then about the coming winter."

The railroad pool did little in Chicago to absorb jobber coal. Whatever may have been the price in the fields, the pool at the end of the week displayed no interest in any price above $3 and other big consumers buying here were able to pick up a good deal at only a few cents over that. They bought enough, in fact, to practically remove one or two of the largest of them from the market.

SOUTHERN ILLINOIS

Quietness reigns throughout the Carterville field of Williamson and Franklin County. A little railroad coal is still on track and, strange to say, there is also a little domestic lump, egg and nut here and there that was supposed to be held that is loosened up now with prices from $4@$4.50.

There has been no disturbance anywhere and no talk of settlement. Somewhat similar conditions prevail in the Duquoin, East Jackson County and Mt. Olive fields. A little coal on hand at one mine is being held for contract.

Throughout the Standard district there are here and there a few cars held back for commercial and a little railroad coal still on hand. At two or three points considerable coal on the ground is being loaded and at other places owners are holding for a price of $4.25@$4.50.

ST. LOUIS

The break in Kentucky prices has reached St. Louis. At the end of last week operators were making offerings from the fields which showed declines on both east and west Kentucky ranging up to 50c. Western Kentucky mine run could be had at $3.15. The only other activity is a tendency of many consumers to store a little coke. This, however, is a minor movement. Domestic business is at a standstill and a little steam is moving from storage piles. Railroads have from 2 to 4 weeks' supply ahead.

Country demand for steam is almost at a standstill. Occasionally an inquiry comes in from dealers in the country for threshing coal, but this is not serious and can be taken care of with wood if necessary.

There has been no change in the price. The domestic market is 50c. above the close on March 31. This 50c. is the re-handling charge from the storage bins.

Reports from western and central Missouri show that several small drift mines are in operation and in Southwestern Missouri some few are in operation on the Frisco in the vicinity of Sprague, Pleasanton and LaSiene.

WESTERN KENTUCKY

As a result of reported Central Buying Committee activities in the Chicago district, and by Hoover and operators in Washington looking toward a plan to prevent further price advances, and a belief on the part of many buyers that prices will be curbed, demand has slacked off somewhat. Inquiries continue numerous, but orders are not so plentiful. There are still a good many buyers in the field, who are buying direct and taking a good deal of tonnage, resulting in less business actually passing through brokers' hands, this making it appear as though the demand is smaller than it actually is.

Last week operators were having little trouble disposing of coal, but their quotations were a little above the prices that many buyers were willing to pay, and most of the business now being placed is industrial demand of more or less an emergency nature.

LOUISVILLE

Inquiries continue, but actual orders are not as good as they were. It is claimed that although the volume going through the jobbers' hands is not as heavy as it was, there is still some direct buying in the fields by industrial concerns as well as Northern jobbers and operators.

Western Kentucky feels that operators who favor price regulatory measures of one kind or another are those who depend upon non-union mines to help them fill contracts. Naturally the brokers and operators who are "pinched" are favoring anything that will prevent further advances. Except from a moral effect that may result and hurt non-union fields later on, many Kentucky operators can see nothing in the Washington conferences that can materially hold down prices.

INDIANAPOLIS

While reports are received in Indianapolis of receding prices at the mines in some of the Eastern fields, there has been no tendency shown here to lower prices of any coal available. Neither operators, distributors nor dealers have had much opportunity to make a concrete demonstration as to their attitude concerning Federal pressure against price soaring, simply because there has been no demand. Nobody is buying.

The retailers especially are hard hit. Prior to the strike they loaded every available space with coal against a long strike and summer buying.

Northwest

Interest Gets Keener Around Head-of-Lakes

Dock Stocks Continue to Shorten and Inquiries Get Thicker—Biggest Mesaba Iron Mine Buys Heavily, Thus Indicating More Industry.

THE Northwest country takes a keener and keener interest in coal as the weeks of the strike pass and the flow of vessel coal from the Lower Lake ports slacks off to next to nothing. Some big consumers are buying—notably the Oliver Iron Mining Co., biggest on the Mesaba Range—indicating a slight industrial revival. This moves even the smaller trade to make rather anxious inquiries about the swiftly melting dock stocks. Prices generally are stiffening. Shipments from the docks to out-of-territory points are also a factor which cause consumers to take more interest in the market.

DULUTH

Placing of contracts for 150,000 tons of run of pile by the Oliver Iron Mining Co., the largest iron mining company of the Mesaba Range, featured the market at the Head-of-the-Lakes last week. This order has acted as no uncertain stimulant to trade. It indicates that the mining company is taking no chances of shortage, due to the strike, and is filling its needs. This order, together with the stocks which the mining company has on the docks will carry it through the entire season. Indication of the firmness of the market is evident in the fact that the price paid by the company is known to be within a few cents of the present market.

Not only has the order shown that the company is protecting itself but also that it is prepared to mine steadily throughout the summer. This is an indication of prosperity on the Iron Range, and many small coal consumers are taking heart and making inquiries which indicate a return to business.

Dock men estimate the stocks are good for only 90 days. Shipments of coal to out-of-territory points have reduced the margin of safety. Five railroads have added to their supplies from this depot within the last week, and at least two of these had not bought in this market for several years. Two more steamers were loaded here last week for near-mine points.

Increased inquiry has come for coal to go to Chicago and other outside points. The local trade at the Head-of-the-Lakes also is ready to jump into the market as soon as more serious shortage becomes apparent.

Shipments to the Duluth-Superior Harbor for the period of the strike apparently have about reached their end. Twenty-six cargoes of coal have been received so far, of which but one of 5,000 tons was anthracite. Only one more is reported as loaded for this port from the lower end of the Lakes, and it is possible that this may be diverted. When this cargo arrives it will mean that shipments are finished. It is barely possible that some docks with non-union mine connections may bring some coal here.

Prices are hardening. The market has not as yet generally come back to $7 for lump and $6.50 for run of pile in Youghiogheny, Hocking and Splint, but some docks are asking these prices. Others are still selling at 50c. off this basis. Screenings are high, however, with the regular market at $5 and some short docks offering at $5.50 only.

MINNEAPOLIS

There has been something of a change in the coal business of the Northwest recently. In the past fortnight or so, there has been quiet and persistent buying at the docks for a number of Western railroads. The buying was cautiously handled in order not to cause any boom to the market, but at figures between $5.25@$5.50 a considerable tonnage has been placed. As a result, the dock trade members feel that they have no intolerable surplus on hand to work against, when the expected decline comes in prices and wages. Therefore, they are returning their prices to $6@$6.50, according to the feeling of the companies as to the stock they have on hand.

MILWAUKEE

Speculation as to the future is the order of the day in Milwaukee coal circles, the general opinion being that soft coal is in for a rise of from $1 to $2 per ton before long, unless the strike nears an end. Public service companies—street railway, gas and electric light—are beginning to grow alarmed as their rates are dependent in the main upon the cost of fuel.

Stocks of coal at the various yards are being gradually depleted as the supply coming by Lake is not what it ought to be at this period of the year; and yet nobody seems anxious to buy coal. The hard coal market is dead and the demand for soft coal is confined to large users. Thus far this season only 8,000 tons of anthracite have been received by Lake, against 199,235 tons during the same period last year. Soft coal receipts aggregate 226,697 tons against 508,812 tons last year.

The city authorities have decided to discard all bids for coal and to buy in the open market as required for the next sixty days or more.

New England

Shippers Seek Spot Offers As Prices Recede Rapidly

Hoover Policy Effective—Pier Accumulations Increase 130,000 Tons in Week—Further Price Drop Indicated—Western Buyers and New York Bunker Contractors Hold Back.

MR. HOOVER'S policy seems to be effective. Local demand was extremely light last week. Prices both f.o.b. vessel at Hampton Roads and at the mines in non-union districts in Pennsylvania and Maryland as well as in West Virginia have receded rapidly during the last few days and there are now shippers who are soliciting offers for spot coal.

At this writing it is reported that accumulations at the three piers amount to more than 200,000 tons as against something over 70,000 tons a week ago. There is every indication that prices will sag further the next week or so, but as yet we have heard no quotation based on less than $6 per gross ton f.o.b. vessel at Norfolk. Western buyers and bunker contractors in New York harbor, by withholding purchases, also have had a hand in this result.

Local demand has been extremely light throughout the week. There is no change in the textile situation, most of the cotton mills being shut down by reason of labor difficulties. While the shoe industry has taken a fresh start by re-opening a large number of factories, notably in Lynn, Mass., the effect on coal will be rather slight because most of the plants concerned either draw their supplies from local dealers or use electric power. Buyers here are well satisfied to wait and from several angles the steam coal market seems to be suffering more from the buyers' strike than from any suspension of mining.

In central Pennsylvania there have been distinct gains in tonnage. Shippers who have been entirely out of the market since April 1 are now looking for orders and quotations are fully a dollar less than a week ago. Receipts via the Hudson River gateways since May 1 have been less than 100 cars in the aggregate and for the near future we see no prospect of any material improvement in demand.

Marine freights are easy at 90c. Hampton Roads to Boston, on large vessels, smaller tonnage ranging up to $1.15, according to size and destination. The surplus of transportation is still much in evidence and it would not be surprising to see rates fall off, now that there is less inquiry for coal.

For distribution Inland there is also only light demand. Sales recently have been made at prices all the way from $7 to $8 on cars Providence or Boston, but the aggregate tonnage disposed was by no means large.

Spot prices are much weaker and there is every indication that they will go to lower levels.

Eastern Inland

Hoover Plan and Freight Cut Depress Prices and Demand

Consumers Felt Reversal Was Coming—Eastern Orders and Steel-Trade Buyers Disappear—Stocks Getting Low—Steel Industry Fortified with Non-Union Contracts.

LOWER prices and curtailed demand have resulted from a combination of circumstances, principally the Hoover price-stabilization plan, the reduction of freight rates and a feeling on the consumer's part that the stiffening price tendencies were due for a reversal of form. Connellsville prices broke $1.50, due to a withdrawal of Eastern orders and buyers for the steel trade. The subsidence of the general demand may be only temporary, as stocks are getting low, but the steel industry is now well fortified with non-union coal contracts, which will safeguard the supply for a reasonable period.

Lake coal has been arriving at the lower ports at the rate of about 1,500 cars per day, most of this tonnage being transshipped from Toledo and Sandusky to Buffalo. That market, however, is fast losing much of its insistency.

PITTSBURGH

From a top price of about $4.50, Connellsville steam coal has broken to $3, through producers continuously reducing their asking prices in the face of lighter demand. Buyers were plainly much impressed by Secretary Hoover's undertaking to bring about lower prices, and have been buying very sparingly. The withdrawal of Eastern buyers may be only temporary, whatever the result of the activities at Washington, but the steel industry appears to be done with its heavy buying, as it now has various contracts in non-union fields, with quite a time still to run. Connellsville byproduct is available at $3.75 or perhaps a trifle less, but encounters little demand.

There is no change in the strike situation in the Pittsburgh district. In the Connellsville region there has been a slightly more pronounced drift of strikers back to work. Opinion now is that the Connellsville strikes will wind up with a sort of stampede back to work, but no prediction is ventured as to when this will occur, the common opinion being merely that it will be long before the regular union strike really comes to a head.

CLEVELAND

The market has lost much of its recent buoyancy. Top prices which were available last week are now meeting with resistance on the part of consumers. Secretary Hoover's warning against price boosting apparently has had more effect upon buyers than upon producers. The latter maintain that the government lacks authority to regulate the quotations for coal. Consumers, however, have been more impressed with the Hoover theory and are setting themselves against any increases.

The only change in the situation has been the appearance recently of a growing number of small consumers into the market. This indicates that stocks are running low. Railroads and steel mills are still buying. Many consumers have been shaving down demand to the minimum pending the adjustment of rates. At present the longer, and in many cases circuitous freight hauls are adding an excessive burden to industrial coal costs.

Only about two thirds of the Lake fuel dumped has been sent to Upper-Lake destinations, the remainder going to lower ports where coal needs are pressing. Non-union coal is coming forward rather freely, but the demand from the Northwest is light.

DETROIT

Except for a slight improvement in buying by steel companies and a little better demand from railroads the coal trade remains sluggish and apparently almost lifeless. There seems to be very little interest in the matter of supply among the steam coal buyers in general.

Some of the users of steam coal are delaying the placing of orders, with the expectation that they will be able to obtain their coal supply at lower prices after the strike is called off. An additional reason for delaying is the freight reduction, announced for July 1.

Lump from West Virginia or Kentucky is quoted at $3.75. Smokeless lump and egg is $3.85, while run of mine and nut, pea and slack of all districts brings about $3.50. There is a scarcity of fine coal because of the curtailed production of lump.

EASTERN OHIO

Demand has subsided considerably, accompanied by declines in spot prices. Inquiries have dwindled and supplies of coal on track in larger terminals are not being readily absorbed.

The chief contributing factors to this situation are the freight rate reductions and the anticipation on the part of buyers that the stiffening tendencies of spot prices on non-union coals were due for a reversal of form. Many consumers still have significant reserve stocks on hand and they are reluctant to further augment these reserves in view of savings to be effected in freight costs beginning July 1. Non-union coals from Pittsburgh and Connellsville are quoted in the open market: Mine run, slack, nut and slack, $3@$3.25; No. 8 deep run, same grades, $3.25@$3.40; eastern Ohio stripping, $3@$3.50; West Virginia and eastern Kentucky, $3@$3.25. This range of spot prices is about 75c. to $1.25 less than those prevailing a week ago.

An appreciable Lake movement continues of non-union coal from Toledo and Sandusky to Buffalo. Arrivals at lower docks average around 1,500 cars per day and dumpings are about 1,000 cars daily. Railroads have approximately 6,000 cars under load at lower docks.

Receipts of bituminous coal at Cleveland during the week ended May 20 were 1,100 cars; divided, 987 cars for industries and 193 cars for retailers. Industrial receipts exceed those of the preceding week by 168 cars.

BUFFALO

The only change in the situation is a persistent report from the Allegheny Valley districts, claiming that prices were off a dollar or more. As a rule the local shippers do not find any material difference in the prices, except that they do not now appear to be going up.

For awhile some consumers were willing to pay excess prices, which favored a possible panic. The output did not increase as sanguine operators predicted and sensational jobbers sent out scare circulars. There is now another side of it. The threat of the government to interfere appears to have stopped large consumers from bidding against one another and now the miners are reported to be getting uneasy in some districts.

Quotations are mostly a matter of trying in vain to reconcile the many conflicting reports. Some shippers see higher figures right away and refer to sales to warrant such an idea.

The only Lake activity is in bituminous coming in from Ohio ports, mainly Toledo. It goes to the large furnaces chiefly, though one railroad company has a purchase of 20,000 tons coming in. This traffic reached a total of 103,500 tons last week.

COLUMBUS

The coal market slumped sharply during the past week. Railroads, public utilities and iron and steel plants are still the big consumers. Buying to replenish depleted reserves has been the rule and there is still a considerable business being placed, but the edge is off the market.

Retailers are not in the market to any extent and are devoting their time to cleaning up. Retail prices have advanced in sympathy with prices at the mines. Pocahontas lump is quoted $7.50@$7.75 and mine run about $7. West Virginia splint lump sells around $7@$7.50 and mine run $6.25@$6.50. There is only a limited quantity of Hocking available, at $6 for lump and $5.50@$5.75 for mine run.

A few Lake contracts have been made. Prices are generally held in abeyance, depending on the future wage scale. Indications point to an active Lake trade, especially if delayed.

NORTHERN PANHANDLE

The seventh week of the strike saw a more concentrated effort being made by the union to force a suspension of operations, an effort which met with only partial success and which did not interfere materially with the shipment of coal. There were several dynamitings and injunctions were being ignored. Railroads and Lake buyers were seeking more tonnage, but prices and general market conditions reflect the uncertainty which prevails in the coal industry at the opening of the Hoover conference on fair prices.

Cincinnati Gateway

Buyers Who Loaded Up at Top Are Caught in Price Drop

All Sizes Fall $1 Following Price Conference—Even Lower Prices Hard to Get—Heaviest Buyers Gone, Market Is Oversupplied.

IN one week's time the price on all grades and sizings of coal dropped $1 a ton as a result of the conference held in Washington between Secretary Hoover and prominent operators. It was a severe jolt for the jobbers and others who had filled up with what free fuel was to be obtained at the top of the market—around $3.75@$4—to find the market dwindling in interest and orders and the price generally sinking until it reached $2.75@$3.25, with the latter price mighty hard to get.

The heaviest buyers now appear to have cared for their immediate requirements, and the removal of these takers left more coal on the market than could be readily absorbed. Dullness developing at Tidewater added further tonnage to the already congested Cincinnati market.

CINCINNATI

All coals weakened late in May. The Hoover conference was given as the main explanation, as buyers found it advisable to await any possible developments accruing from the "fair-price" meetings.

So far as high-volatile sales are concerned these have not kept pace with production, or more properly speaking, with the tonnage of free coal that is now coming forward. After the $3.50-price had been reached, southeastern Kentucky operators and sales agents, in order to get their tonnage moving, cut the price down as low as $3, which forced an entirely new turn to affairs. The heavier buyers, the steel people, railroads and a great many of the public utilities have their immediate requirements cared for, and with this heavy entity removed more coal was being offered than could be taken.

The same story is told of the smokeless situation—except that the bottom dropped out of the buying at Tidewater, which sent the coal West. The bituminous people were having their difficulties in making sales, however, and the low-volatile interests were quick to realize the situation and likewise made drastic cuts in price.

HIGH-VOLATILE FIELDS

KANAWHA

With approximately 2,000 miners at work, it has been possible to increase production. Many miners are still on strike but sentiment among them for a continuance of the strike is greatly divided. Demand and prices suffered a relapse, last week.

LOGAN AND THACKER

Logan mines are maintaining daily production at almost 60,000 tons. There is a strong demand at Tidewater but so far the bulk of the output is going to the steel centers and to Ohio and Michigan points. Lake shipments also are increasing. Prices, however, broke badly last week, because of government efforts to prevent profiteering.

No market losses have been eliminated entirely from the Kenova-Thacker field and the output of about 160,000 tons a week represents a production of nearly 83 per cent of potential capacity. Most mines are producing nothing but mine run, which is largely consigned to Western markets. Prices dropped $1 a ton last week, as buyers withheld orders awaiting the result of the Hoover conference.

NORTHEASTERN KENTUCKY

An increasing demand for coal was accompanied for further advances in price late in May. Lake shipments are swelling the production, railroad facilities alone handicapping producers. Late reports indicate a bad break in prices, as in other West Virginia fields.

SOUTHEASTERN KENTUCKY

Pending Hoover's conference with coal men, prices have eased off somewhat and there is not the active buying that obtained a week ago. Car supply is better than at any time during May. Practically all mines received a full supply for the past four days and state that prospects are good for regular supply for the immediate future. Production is increasing every day.

LOW-VOLATILE FIELDS

POCAHONTAS AND TUG RIVER

Pocahontas mines had all they could do to handle orders during the seventh week of the strike. In many instances companies have sold their output for several weeks ahead. Late in May a market reaction occurred; due to efforts of the operators to avoid profiteering, many buyers withdrew their orders to await the result of the Hoover conference. Prices made a bad break, in some cases going down an even dollar.

Tug River mines continue to produce more coal than at any time in the recent history of the field, production being above that of the war-time period. Shipments to western points are unusually large but at the same time there is much coal going to Tidewater.

NEW RIVER AND THE GULF

Although New River production is still far below normal, mines are resuming operation from day to day notwithstanding a strike. Shipments to Columbus and other Midwest markets as well as to Tidewater are heavy. Although the principal demand is for mine run, other grades are being accepted in lieu thereof when available.

Gulf production is now on a normal basis except for losses resulting from a labor shortage, such losses amounting to about 50,000 tons a week, with approximately 27,000 tons a day being produced. Much of the tonnage originating in this field is being shipped to Tidewater. Prices are about the same as those prevailing in the New River field.

South

BIRMINGHAM

Inquiry from foreign territory has been somewhat more active, but relatively little tonnage has been actually booked. However, indications are that the expected influx of orders from sections formerly supplied from the central competitive field and other strike centers will begin very soon. The promulgation of emergency rates from the Alabama field to points in central freight association territory is expected daily. The rates reported to have been agreed upon of $4.60 to Chicago, $4 to St. Louis and $3 to Centralia should enable mines to place quite a quantity of coal in territory adjacent to these points. The above rates, it is understood, will hold good until Oct. 1.

The trade in local territory is slightly better than a week ago, there being some increase noted in both production and movement.

There is a fairly good market for the better grades of domestic, some few producers having sold ahead for a month or better, but very few mines producing domestic coal are working more than half time account no market for the steam product. Production has shown some increase during the past two weeks.

Quotations f.o.b. mines are as follows:

	Washed	Lump and Egg
Carbon Hill	$2.00@$2.25	$2.20@$2.45
Corona	2.25@ 2.50	2.45@ 2.70
Cahaba	2.00@ 2.25	2.95@ 3.45
Black Creek	2.25@ 2.50	2.75@ 2.95
Pratt	1.90@ 2.25	....

VIRGINIA

Under the spur of a further increase in the demand, it was possible to speed up production to a point not far from 90 per cent of potential capacity, representing an output of nearly 200,000 tons a week. No-market losses almost disappeared toward the end of May, although the demand and prices suffered a decline late in that period.

Canada

TORONTO

The situation shows practically no change. Demand continues light, and only small consignments are being received from the non-union mines. Industrial consumers of bituminous show no disposition to replenish stocks at present quotations, and are looking for a drop in prices on the termination of the strike. Retail prices are unchanged but wholesale rates have been steadily advancing.

Quotations are as follows:

Retail:	
Anthracite egg, stove and nut	$15.50
Pea	14.00
Bituminous steam	9.25@9.75
Domestic lump	11.25
Cannel	16.00
Wholesale, f.o.b., cars destination	
1-in. lump	$9.25@$10.00
Slack	8.00@ 8.75

News Items From Field and Trade

COLORADO

Approximately 400,900 tons were mined in Colorado during April, according to data prepared by James Dalrymple, state coal mine inspector. The production for the corresponding month a year ago was 644,868 tons.

ILLINIOS

William Miller, for many years general superintendent of the Peabody Coal Co.'s interests in West Frankfort and well remembered by the coal trade in Illinois, has purchased a retail coal yard at Murphysboro and will operate the yard in the future. The yard was formerly owned by Dixon & Bilbrey.

The Springfield-Athens Coal Co., of Springfield, operators of a coal mine at Athens, have dissolved the corporation and surrendered their charter. The company was incorporated Oct. 21, 1910, and had a capital stock of $60,000. The president of the company was Colonel James W. Jefferson and the secretary, Roy T. Jefferson, both of Springfield.

Construction work at Orient Mine No. 2 at Orient, owned by the **Chicago, Wilmington & Franklin Coal Co.**, of Chicago, will continue on through the strike under a special agreement turned over to the Dravo Construction Co., of Pittsburg, which is doing the work. When completed the mine will be as large if not larger in capacity than No. 1 Mine which holds the present world's record for eight hours' hoisting. The work is being done in three shifts daily and over 100 union men are employed. According to the agreement, all of the coal hoisted in the sinking and development of the mine during the present strike must be stored near the shaft and not be sold for commercial purposes until the strike is over.

The mine of the **Donk Bros. Coal Co.**, at Troy, near East St. Louis, which the company recently announced would be abandoned and closed down, will again operate as soon as the strike ends. Business men of the town have completed the formation of a $50,000 stock company and will purchase the mine and equipment. The mine was practically the only industry left for the town's support and the business men foresaw the larger per cent of the 3,000 population moving to other fields if the mine should close. Approximately $20,000 to $30,000 will be spent by the new management in repairs and new equipment for the mine before it is again operated.

The Illinois Chamber of Commerce will convene on Sept. 19th at West Frankfort. While in convention the arrangement committee has planned an extensive tour through some of the largest mines in the world, including the Orient Mine No 1 at Orient of the **Chicago, Wilmington and Franklin Coal Co.**, and several properties of the **Old Ben Coal Corporation.**

W. E. Rutledge, president of the Security Coal & Mining Co., Chicago, and vice-president of the Rutledge & Taylor Coal Co., was in DuQuoin recently inspecting operations near there.

INDIANA

The Clovelly Coal Co., at Terre Haute, has changed its name to the **Talley Coal Mining Co.** The company will still retain its offices in Terre Haute.

A cave-in is threatening the 265 ft. shaft of the **Sunnyside Mine** in the western part of Evansville. A break occurred about 40 ft. down the shaft and a large amount of earth passed through the wooden supports.

The Deep Vein Coal Co. is preparing to sink a new shaft to the workings of the Princeton Mine, which was recently destroyed by a cave-in. The company has petitioned the City of Princeton to annex a strip of territory 200 ft. wide and several blocks long along the southwestern part of town, to include the new mine.

One of the thickest veins of coal ever opened up in southern Indiana has been found at the L. J. Stanley mines, near Shoals. The mine is a slope pit entering a hillside. At a distance from the entry of about 60 ft. the coal has a thickness of about 7 ft. About 30 ft. higher on the hill is another mine under the same management with a vein which averages about 4 ft. These mines are in an entirely new field and the coal covers several hundred acres. It lies within a quarter of a mile of the B. & O. and the engineers of the railroad have recently been at Shoals laying out a new siding.

KENTUCKY

The Hardy Burlingham Mining Co., Hardburly, has recently purchased several hundred acres of timber and coal land on Lott's Creek in Perry County, and plans to lumber this ground for mine timbers. Several other smaller areas of timber have recently been purchased by the company.

U. D. Williams, Paintsville, has been appointed mine inspector to succeed **Lacy Laxton**, of Harlan, resigned.

The Memphis Coal Mining Co., Mannington, after being down for some weeks, is planning to resume operations with a payroll of about 150 men.

The Goodwin-Barney Coal Company's plant at Left Beaver Creek, north of Whitesburg, has been purchased by the **Southern Elkhorn Coal Co.** at a consideration said to approximate $100,000 cash down. Several of the smaller companies are being taken over by larger corporations in that region.

NEW YORK

The coal office of **W. A. Stone & Co.**, Buffalo, occupied as a jobbing branch, has been closed on account of poor business. The company some time ago discontinued its Toronto office. The headquarters of the company are at Uniontown, Pa., in the Connellsville coking district, so that it was too far from this market to use it much for its own coal. At one time it did a large anthracite business here.

Following a meeting of the Board of Directors of the General Electric Co., held in New York, **C. A. Coffin**, retired as chairman and was succeeded by **Owen D. Young**, long associated with the company as vice-president. The position of president was filled by the election of **Gerard Swope**, president of the International General Electric Co., succeeding **E. W. Rice, Jr.**, who requested to be allowed to devote his entire energies to the further upbuilding of the scientific, engineerng, and technical phases of the company's work, and who will become honorary chairman of the board. **Anson W. Burchard**, for many years identified with the company as vice-president, was elected vice-chairman of the board. **J. R. Lovejoy**, vice-president in charge of sales, was elected a director, as was also **G. F. Morrison**, vice-president.

The Quigley Fuel Systems, Inc., has been organized, with offices at 26 Cortlandt St., New York. Wm. H. Baker is president; W. O. Renkin, managing engineer and L. W. Marso, Pittsburgh representative. The new organization takes over the pulverized fuel department of the Quigley Furnace Specialties Co., which had lately been operated by the Hardinge Co., Inc., as the Quigley Fuel Systems Department.

The consolidated income account of **Burns Bros.** and **Wm. Farrell & Son** for the year ended March 31, 1922, shows a surplus after dividends of $619,051. This compares with $854,381 for Burns Bros. for the corresponding period of 1921. Net sales for the year amounted to $31,373,520, gross profits to $3,228,003 and net profits to $1,376,138.

The Virginia Iron, Coal & Coke Co. has declared an initial dividend of 2½ per cent on the preferred stock payable July 1 to stockholders of record June 15. The stock is 5 per cent cumulative and was distributed Feb. 15 as a 50 per cent stock dividend to holders of the $10,000,000 capital stock then outstanding.

James Elwood Jones, of Pocahontas, Va., general superintendent of the Pocahontas Fuel Co., was a recent visitor in New York.

At the annual meeting of the **Burns Bros. Coal Co.**, seven new directors were elected to the board. There was no discussion of the resignation of the heads of the company as had been expected. The new directors elected were Harry V. Lake, **Moritz** Rosenthal, Gerhard Dahl, Mason B. Starring, T. L. Chadbourne, Thomas F. Farrell and S. A. Wertheim. The latter two represent the Farrell interests. Out of a total of 240,000 shares of stock represented at the meeting 238,736 were voted in favor of the present officers.

OHIO

Application was filed in the Federal Court at Columbus late in May by five coal companies in the eastern Ohio field, engaged in stripping operations, against union coal miners to restrain them from interfering with their non-union workers. Plaintiffs, who consist of the **Harmon Coal Co.**, **The Wayne Coal Co.**, **the Penova Coal Co.**, **the Tasa Coal Co.**, and the **United Coal Mines, Inc.**, that since April 1, at the start of the coal strike, their workers have been interfered with and coerced by inducements, threats, intimidation and physical violence to affiliate with the union. A temporary restrainng order which is to be made a permanent injunction is asked for.

Papers have been filed with the secretary of state increasing the authorized capital of the **Black-Burn Coal Co.**, from $200,000 to $250,000.

L. D. Tracy, of the U. S. Bureau of Mines, will address the Chiefs' Convention at Columbus, at its session, June 6 and 7 on "Hazards in Industrial Plants in Using Pulverized Coal."

PENNSYLVANIA

A new organization has been formed in Altoona, to be known as the **Atlantic Fuel Corporation**, chartered under the laws of Delaware. W. Frank Vaughn, a local attorney, is the president; B. F. McCartney, vice-president; H. H. Moyer, secretary and treasurer, and J. R. Carpenter, general manager of mines, with the following board of directors: W. F. Vaughn, James W. Laing, B. F. McCartney, H. H Moyer, J. M. Fissel, J. R. Carpenter and Grant Yon. The new corporation has a half-dozen mines to start with. The mines taken over are all well located and equipped so there will be no waiting for developments. Offices will be in Altoona.

One of the most remarkable coal mines in the United States, from the standpoint of production, is what is called the Rolling Mill Mine of the **Cambria Steel Co.**, located in Johnstown. This mine was opened in 1852 and has been producing coal for seventy years. In that time it has produced 25,000,000 tons and has not yet exhausted 50 per cent of the available coal.

Sales of the **Westinghouse Electric & Manufacturing Co.** amounted to almost exactly $100,000,000 in the past year, as shown by its annual report, as of March 31, 1922. This is the largest volume of business handled by this company except during the abnormally active previous three years.

Coal companies recently incorporated at Harrisburg are **Suffolk Coal Company, Inc.**, Avoca; capital, $240,000; treasurer, E. B. Jermyn, Jr., Scranton. Purpose: Mining and preparing coal for the market. Incorporators: Mary S. Jermyn, Elizabeth Jermyn White and William S. Jermyn, all of Scranton. **Lackawanna Coal Mining Co.**, Carbondale, $50,000; John B. Williamson, Philadelphia, treasurer. Purpose: Buying, owning, leasing and operating coal lands. Incorporators: W. S. Blaisdell, Murray B. Courtright and William B. Wigton, Land Title Building, Philadelphia. **Grove Hill Coal Co., Inc.**, Blakely, $20,000; David R. Humphreys, Peckville, treasurer. Purpose: Mining, preparing coal for the market, leasing and buying coal lands. Incorporators: David R. Humphreys, Peckville; W. L. Houck and R. M. Lebrecht, Scranton. **Penn Valley Coal Mining Co.**, Youngwood, $200,000; C. H. Harman, Youngwood, treasurer. Purpose: Mining, quarrying and preparing for market coal, stone and clay. Incorporators: J. S. Best, J. C. Lowe and L. G. Darr, Youngwood. **Keibler Coal Co.**, Greensburg, $15,000; A. Turney McConnell, Greensburg, treasurer. Purpose: Mining coal and manufacturing coke. Incorporators, Paul Johnson, C. L. Amend and Frank N. Beatty, Greensburg.

The Imperial Cardiff Coal Co., Cambria County, has filed at the State Department a notice of an increase in capital stock from $50,000 to $250,000. E. H. Zimmerman, treasurer.

Edward Boyle, superintendent of the Linn plant of the American Coke Corporation, has been prompted to the position, newly created, of general inside superintendent of all the mines. Mr. Boyle's successor as superintendent of the Linn plant has not yet been named.

State Mine Inspector W. B. Wardrop has changed his headquarters from Patton to Barnesboro.

James D. Walker has been appointed state mine inspector of the third Bituminous District, with headquarters at Butler.

A State charter has been issued to the **Willard Coal Co.**, Pittsburgh, with a capital stock of $40,000. John C. Shaw is treasurer and the purpose of the company is the mining and preparing coal for the market. The incorporators are Mr. Shaw, D. S. Moxon and W. A. Woodburn, all of Pittsburgh.

Earl E. Hewitt, general manager of the Dilltown Smokeless Coal Co., at Dilltown, in Indiana County, is making a strong fight for the Republican nomination for Congressman of his district. Hewitt is widely known in the mining industry, was graduated from the Mining School of Penn State College and is still remembered as a prominent athlete.

The Graff Furnace Co. has obtained a verdict of $12,000 against the **Scranton Coal Co.** in the U. S. Court in Scranton, for damages done by mine caves. The plaintiff contended the company was bound to leave sufficient lateral support.

The Superior Court has affirmed the judgment of the Schuylkill County Court in awarding $1,200 to Enoch Bakunas in a claim against the **Philadelphia & Reading Coal & Iron Co.** Bakunas was struck in the eye by a piece of stone while breaking rock. The referee held that this caused a cataract which led to an operation in which the use of the eye was lost. He awarded compensation and was sustained by the Compensation Board. Judge Koch, of Schuylkill County, in an appeal by the same company from an award to Cassie Samoskie, has remitted the record to the Compensation Board for a further hearing, the Board's previous action in sustaining the award being reversed. The claimant's husband died after helping move a car at Silver Creek Colliery. He had sat down to eat his lunch when stricken with apoplexy. Judge Koch says the evidence shows that he had arterio sclerosis to a marked degree, and was therefore liable to apoplexy whether at work or not. He held that where death comes at work it is only fair to employers that it be shown that the death was due to the work and not to disease. The medical testimony, he said, did not show that Samoskie used any extra effort pushing the car.

Judge Berger, of Schuylkill County, has dismissed the appeal of the defendant from an order of the Compensation Board affirming a referee's award in the case of Peter Holos against the **Buck Run Coal Co.**

Officials of the **Pennsylvania Coal Co.** made a recent inspection of the Nos. 9, 6, 14 and Ewen collieries. At a recent meeting of the board of directors an inspection was ordered and several improvements such as power plants, new shaft openings and new engine rooms were planned. It was reported that the company intends to expend over $200,000 in improvements at the Pittston collieries in order to increase the output.

UTAH

The Rock-Ledge Coal Co. has been incorporated with capital stock of $500,000. The incorporators are N. E. McLachlan, L. W. Ferris, P. G. Ellis, E. J. Klemm and L. A. Lawyer.

The Lion Coal Co., Ogden, has closed its yards and hereafter will do an exclusive wholesale business. Marriner Browning has been appointed general manager of this company. He has been acting manager since the resignation of D. H. Pape.

VIRGINIA

The Norfolk & Western Piers recently broke all dumping records for a 16-hr. day. Monday, May 15, these piers dumped 41,735 tons of coal in 16 hours, the highest record ever made. The next highest record was Aug. 22, 1921, when the piers dumped 41,085 tons. The record was broken again May 18, when the piers dumped 43,110 tons. Officials of the Norfolk & Western announced that if business warrants it they are prepared to put on three 8-hr. shifts.

The Virginian Ry. is said to be contemplating the construction of another coal pier. Plans for this development have not been made ready and officials of the company say there is nothing to be said about it at present.

An error in coal bids opened by the Shipping Board caused them to be thrown out and new bids asked for. As a result, the price of coal for Shipping Board steamers at Hampton Roads during June will be $5.70, instead of $4.70, the amount of the low bid first opened. **The Chesapeake & Ohio Coal & Coke Co.** has been awarded contract for the June supply. No amount is specified, but the average is expected to be 60,000 tons per month.

WEST VIRGINIA

T. H. Johnson, of Bellaire, Ohio, president of the Chesapeake Coal Co. which operates in Marion County, spent a few days recently at the company's plant in the Fairmont field.

R. H. Eisner, Western manager for the Old Dominion Coal Corporation, was in Elkins recently looking after certain of his coal interests there.

General Edward O'Toole, general manager of the United States Coal & Coke Co., with headquarters at Gary, was attending the annual meeting of the Huntington Chamber of Commerce at Huntington, recently.

J. G. Bradley, president of the National Coal Association was elected president of the West Virginia Coal Association at the annual meeting in Chicago. **W. H. Cunningham** was elected secretary; **C. C. Dickinson**, treasurer, and **Everett Drennan**, vice-president.

A. C. Carver, who for six years was assistant to C. D. Weeks of the Milwaukee Coke & Gas Co., has started in business for himself as the **Carver Coal Co.**, at Charleston.

Albert Wilt, of Elkins, president of the Willuquison Coal Co., paid the plant of the company on the Buckhannon branch a visit recently.

R. P. Maloney, general manager of the Davis Coal Co., with headquarters at Thomas, was a visitor in the Somerset field of Pennsylvania a few days ago.

The seventh week of the strike was featured in northern West Virginia by the resumption of operations at two mines at Adrian which have been in idleness since the beginning of the strike. The two mines at which production on a small scale was resumed were those of the **W. H. Green Coal Co.**, and the **Mincar Coal Co.** Between Elkins and Charleston, not less than 60 mines are operating, some of them on a large scale, such as the mines of the Elkins River Coal & Lumber Co., of Widen.

In order to protect its employees from molestation and to insure a continuance of operations, the **Windsor Coal Co.**, operating at Beech Bottom in Brooke County, has secured from Judge J. B. Summerville of the Circuit Court for the First Circuit of West Virginia a temporary injunction directed against the international and local officers of the United Mine Workers of America. The restraining order expressly prohibits any interference with the operation of the Windsor company's mine, and prohibits the union from making any effort to induce the employees of the company to join the U. M. W.

Co-operative ownership, management and operation of the **Thermal Mining Plant of the Champion Collieries Co.** at Thermal, near Lost Creek, by coal miners is projected in the contemplated purchase of the property under an option taken by R. E. Garrett, of Clarksburg. Mr. Garrett, who was formerly superintendent of the mine, plans to take the property over through the sale of shares to the miners living at Thermal and its vicinity. The stipulated purchase price is $162,500.

G. H. Caperton, president of the New River Operators' Association, attended the conference of mine operators with Secretary Hoover at Washington during the third week of May.

Charleston people have organized the **Cherokee Coal Co.**, having a capital stock of $10,000. Charleston is to be the headquarters of the company. Active in organizing this company were W. B. Kubach, O. C. Kubach, J. R. Cunningham, N. P. Cunningham and Lee Stone, all of Charleston.

Visitors at Huntington, Charleston and Bluefield during the latter part of May were **C. T. Denly**, president, and **H. T. Rawlins**, vice-president of the Schroeder-Kelly Coal Co., of Cleveland.

Southern West Virginia was represented by a large delegation of non-union operators at the conference with Secretary Hoover held at Washington on May 18 to consider methods toward preventing profiteering and a runaway market. Among those present were: **Isaac T. Mann**, head of the Pocahontas Fuel Co., and president of the Pocahontas Operators' Association; **E. E. White**, of the E. E. White Coal Co., president of the Smokeless Coal Operators' Association of West Virginia and of the Winding Gulf Operators' Association; **W. R. Thurmond**, president of the Argyle Coal Co., and of the Logan Coal Operators' Association; **G. H. Caperton**, president of the New River Operators' Association; **W. D. Ord**, president of the Roanoke Coal & Coke Co.; **James D. Francis**, vice-president of the Island Creek Coal Co.; **S. A. Scott**, general manager, New River Co.; **Justus Collins**, president Winding Gulf Collieries Co.; **W. P. Tams**, president Guyan Collieries Corporation; **P. M. Snyder**, president East Gulf Coal Co.; **C. C. Dickinson**, Dry Branch Coal Co.; **A. J. Dayton**, president Superior Eagle Coal Co.; **S. R. Smith**, president Stone Branch Coal Co.; **T. E. Houston**, of Cincinnati, and **J. C. McKinley**, of Wheeling.

BRITISH COLUMIBA

Major A. W. Davis, D. S. O., has been appointed provincial resident mining engineer for the Vernon and Ashcroft mining divisions, to fill the vacancy occasioned by the death of R. W. Thompson. Major Davis organized the Third Tunnelling Co., Canadian Engineers, in France, and did excellent service there. On his return to Canada, at the close of hostilities, he became general manager of the Dolly Varden mine until the mine was closed down.

The creditors of the **National Finance Co.**, having given their approval, Justice Murphy has sanctioned the expenditure of $18,000 for diamond-drilling on the coal lands in the Copper River district, in the western extremity of the Omineca mining division. The expenditure is necessary in order to hold the claims, on which more than $300,000 has been expended, and, it is claimed, 15,000,000 tons of coal proved. The coal property is the largest single asset of the liquidation.

ONTARIO

The Federal Coal Co., the head of which is W. C. Denny, has made an assignment for the benefit of its creditors. The company's office is in the C. P. R. Bldg., Toronto, and the organization was formed under the name of the Imperial Coal Co. in 1919.

P. H. Henry, president of the Kentenia Coal Co., Inc., of Cincinnati, and a former Canadian, was a recent visitor in Toronto where he was greeted by many old friends. Mr. Henry was, many years ago, a resident of Port Hope, Ont., and is well-known in the Canadian trade.

The J. P. Burton Coal Co., Cleveland, has opened an office in Toronto, with J. J. Nolan in charge. Mr. Nolan was formerly with the Ontario Fuel Co.

J. H. Milnes, of the Milnes Coal Co., Ltd., Toronto, and Mrs. Milnes have sailed on the Aquitania for an extended visit to the British Isles and the Continent.

WASHINGTON, D. C.

Officers of the **National Retail Coal Merchants' Association** for the year 1922 are: President, Homer D. Jones, Chicago, Ill.; first vice-president, R. J. Wulff, Brooklyn, N. Y.; treasurer, Samuel B. Crowell, Philadelphia, Pa.; vice-president, Ernest B. Sweeney, Kansas City, Mo.; vice-president, J. Maury Dove, Jr., Washington, D. C.; vice-president, Wallace B. Phinney, Boston, Mass.; vice-president, Peter Beck, Harvey, Ill.; vice-president, W. T. C. Berlin, Memphis, Tenn. Board of directors for three years: W. A. Smoot, Alexandria, Va.; Luke D. Drury, Richmond, Va.; G. F. Rodgers, St. Katherine's, Ont.; Robert S. Hayes, Newport, R. I.; Roderick Stephens, New York City, N. Y.; C. B. Staats, Albany, N. Y.; Saul Munter, Indianapolis, Ind.; L. W. Ferguson, Chicago, Ill., and Joseph Langford, Davenport, Iowa. For two years: C. A. Elwood, Rochester, N. Y., and Walter L. Montgomery, Harrisburg, Pa.

David Wing, who has been associated prominently with many of the Government's activities touching coal, has been designated by Secretary Hoover to act as the Department's point of contact with trade associations desirous of discussing plans for submitting their statistical data to the Department.

W. D. Ord, of Landgraff, president of the Roanoke Coal & Coke Co., was a visitor in Washington during the latter part of May.

Association Activities

West Virginia Coal Association

On the eve of the meeting of the National Coal Association at Chicago, as is its custom, the West Virgina Coal Association held a meeting at Chicago on May 24. This was largely attended since there were a good many coal men from West Virginia in Chicago to attend the meeting of the national association. General conditions in the industry were discussed and the position to be taken by West Virginia on various questions to come before the convention were discussed and a policy decided upon.

J. G. Bradley, president of the West Virginia association and who is also president of the national organization, was on hand for the meeting and made a brief address. C. A. Cabell, president of the Kanawha Operators' Association, Colonel W. M. Wiley, vice-president of the Kanawha association, and D. C. Kennedy, secretary of the association, were also present.

The Association re-elected these officers to serve another year: President John G. Bradley of Dundon; vice-president, Everett Drennen of Elkins; secretary, W. H. Cunningham of Huntington; assistant secretary, James E. Hart of Huntington; treasurer, C. C. Dickinson of Charleston. Mr. Dickinson was chosen to succeed Quin Morton as a director of the National Coal Association. Mr. Morton is suffering from paralysis. J. J. Tierney of the Crozer-Pocahontas Coal Co. was re-elected a director of the National.

Northern West Virginia Coal Operators' Association

Since the inception of the strike, directors of the association have been holding regularly weekly meetings for the purpose of discussing and dealing with any question which may arise during the course of the strike. At the meeting held during the third week of May, the directors gave consideration to the conference suggested by Secretary of Commerce Hoover as a means of preventing unduly high prices for coal. No announcement was made as to what action the association will take in connection with the suggestion of Secretary Hoover.

Although not made in connection with the meeting alluded to, nevertheless a statement recently authorized by the association probably reflects its attitude toward a shortage of coal. In the statement mentioned it was said: "The miners and the operators know that there have been only two times in the past sixteen years that a scarcity of bituminous coal was threatened. Both of these times the shortage was due to a lack of railroad facilities. It was a question of transportation. Should a shortage develop from the present situation, it will be because the United Mine Workers of America ordered a nation-wide strike; and they will be called upon to answer why they shut off the entire coal production of the country because of a dispute of doubtful justice in the fields producing only two-fifths of the bituminous product. They must answer this just the same as the railroads were called upon to answer why their transportation system was inadequate in the previous shortage, which resulted in the government operation of the railroad and control of the shipment of bituminous coal."

Recent Patents

Surveyor's Instrument and Range Finder. John Ceserani, Butte, Mont., assignor of one-third to George Wrightson and one-third to **Frank W. Carpino**, Butte, Mont., 1,406,150. Feb. 7, 1922. Filed Nov. 8, 1919; serial No. 336,620.

Crushing Machine. Wm. M. Hoppin, Sharon Hills, Pa., 1,406,189. Feb. 14, 1922. Filed Oct. 2, 1920; serial No. 414,220.

Miner's Electric Safety Lamp. Arthur P. Ford, Stoke-upon-Trent, England, 1,406,359. Feb. 14, 1922. Filed March 10, 1921; serial No. 451,246.

Retarder Feeder for Crushing Machines. Joseph L. Hiller, Mattapoisett, Mass., assignor to Pennsylvania Crusher Co., Philadelphia, Pa., 1,407,330. Feb. 21, 1922. Filed March 14, 1917; serial No. 154,739.

End-Gate Raiser for Mine Cars. Zack Grass, Heiner, Ky., 1,407,329. Feb. 21, 1922. Filed March 2, 1920; serial No. 362,813.

Coal-Chute Attachment. Henry E. Downer, Princeton, Ill., 1,407,391. Feb. 21, 1922. Filed Sept. 9, 1921; serial No. 499,511.

Powdered Coal Burner. Henry J. Stehli, Cedar Grove, N. J., assignor to Sintering Machinery Corp., Netcong, N. J., 1,407,600. Feb. 21, 1922. Filed Nov. 26, 1920; serial No. 426,486.

Process of Forming Fuel. Donald Markle, Hazleton, Pa., 1,407,700. Feb. 28, 1922. Filed March 22, 1920; serial No. 367,702.

Feeding Mechanism for Mine Cars. George M. Johnson Jeannette, Pa., 1,408,088. Feb. 28, 1922. Filed Jan. 28, 1921; serial No. 440,686.

Drainage System. Wilson J. Snively, Mount Pleasant Township, Westmoreland Co., Pa., assignor of one-half to W. I. Hunter, Greensburg, Pa., 1,405,725. Feb. 7, 1922. Filed July 15, 1920; serial No. 396,522.

Electric Signaling System for Mines. Albert Major, Shenandoah, Pa., 1,405,858. Feb. 7, 1922. Filed June 14, 1919; serial No. 304,228.

Traffic News

The I. C. C. has assigned the complaint of the **Wayne Coal Co.**, for argument before it in Washington on June 10 and the complaint of the **Milwaukee Western Fuel Co.**, for argument June 29.

Protest against the rates having been withdrawn, the I. C. C. has vacated its order suspending reduced rates on coal from Illinois mines on the Illinois Central to Arkansas points on the St. Louis Southwestern R.R. The schedules had been suspended until July 30.

The case involving rates on coal from the Southwest to Omaha and related points assigned for hearing May 9 at Kansas City, Mo., has been postponed to June 12.

In the complaint of the C. L. S. & South Bend Ry. vs. the Illinois Central, an examiner **recommends that rates** on bituminous coal from Cass, Ind., to Michigan City, Ind., were not unreasonable.

In the complaint of the **Tuffli Bros. Pig Iron & Coke Co.**, an examiner recommends that shipments of coke from Benham, Ky., to Abilene, Kan., were overcharged though the rate was not unreasonable.

Revison of demurrage rules on transshipment of Tidewater coal at Hampton Roads is requested in a petition to the I. C. C. by the **Hampton Roads Demurrage Committee.** The petition asks that the commission establish and apply in the future to the transshipment of tidewater coal at Hampton Roads, in lieu of existing demurrage rules and rates, rules and regulations which shall provide for no more than a charge of $1 per car per day, allowing 10 days' free time, Sundays and holidays excluded, averaged over 90 days; together with a provision providing for the application of surplus credits days accumulated during the same 90 days' period on cars left standing on track at the end of such period and also the elimination from the substitution car rule of any provision confining that rule to cars of coal of the same pool or classification designation.

In a decision just handed down, the commission holds that bituminous coal shipped from mines in Indiana by **W. L. Carney** to Chicago in January, 1921, was misrouted, but that as Carney was not the real party in interest he is not entitled to reparation.

A report by the I. C. C. on movement of freight in 1921 shows that 2,655,676 cars containing 125,807,944 tons of anthracite were transported. There were 10,623,266 cars containing 532,762,317 tons of bituminous also transported.

The I. C. C. has suspended until Sept. 15 the proposed cancellation of joint through commodity rates and the application instead of combination rates on bituminous coal from mines on the L. & N. in Kentucky, Tennessee and Virginia to points in Minnesota and South Dakota and to Superior, Wis. Under the proposal the rates from Middlesborough, Ky., and all Group 1 mines to Aberdeen, S. D., would be increased from $6.87 to $7.88 a ton, and to Minneapolis from $5.40 to $6.33.

In the complaint of **Mark McFadden and others** an I. C. C. examiner recommends that rates on anthracite from points in Pennsylvania to Detroit be declared unreasonable.

Industries of Lockport, N. Y., are asking the I. C. C. for the same rates on coal from the Reynoldsville, Pittsburgh and related coal districts as are accorded Buffalo. **The Covert Gear Co.** has instituted the proceedings. The railroads oppose the plan on the ground that existing differentials between Buffalo and Lockport should be maintained.

In the complaint of the **National Retail Coal Merchants' Association**, the B. & O. contends that it has not been proven that its rules for re-weighing and inspecting coal are unjust.

Following authorization by the Interstate Commerce Commission, the **Alaska Anthracite R.R. Co.** has issued $1,200,000 first (closed) mortgage 6 per cent 20-year sinking fund gold bonds.

Publications Received

Sound-Proof Partitions, by F. R. Watson. University of Illinois, Urbana. Bulletin No. 127. Pp. 85; 6 x 9 in.; illustrated. Describes methods and results of various investigations relating to the action of materials on sound, gives practical installations of soundproofing and sets forth, in accordance with existing knowledge, recommendations that may be applied where sound insulation is wanted.

Analysis of Detonating and Priming Mixtures, by C. A. Taylor and W. H. Rinkenbach. Bureau of Mines. Technical paper 282. Pp. 33; 6 x 9 in.; illustrated. This paper is a continuation of the publications on explosives analysis from the Pittsburgh laboratory of the Bureau of Mines. The methods given are those used in practical work; they are not intended to fill the requirements of a research chemist working on a particular compound, but they do cover the needs of a chemist analyzing explosive compositions and desirous of results that are accurate within the limits of the variation of the mixtures themselves.

Handbook on Controllers for Electric Motors. This 29-page, 4 x 6½ in. booklet is issued by The Electric Power Club of St. Louis, Mo., and may be obtained from them or from the leading manufacturers of electric power and control apparatus. It should prove a useful book for users of electrical control apparatus. It sells for 25c. a copy.

Coming Meetings

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

Central Pennsylvania Coal Producers' Association will hold its annual meeting at Altoona, Pa., June 8. Secretary, Charles O'Neill, Altoona.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

The annual convention of the **Pennsylvania Retail Coal Merchants' Association** will be held at Trenton, N. J., June 7 and 8.

American Institute of Chemical Engineers will hold its summer meeting at Niagara Falls, Can., June 19-22, with headquarters at the Clifton Hotel. Secretary, Dr. J. C. Olsen, Polytechnic Institute, Brooklyn, N. Y.

Southwestern Interstate Coal Operators Association will meet June 13 at 619 Keith & Perry Bldg., Kansas City, Mo. Secretary, W. L. A. Johnson, Kansas City, Mo.

Illinois Mining Institute will hold its summer meeting June 8, 9 and 10 on the Mississippi River, the boat leaving St. Louis, Mo., on June 8. Secretary, Martin Bolt, Springfield, Ill.

Mine Inspectors' Institute of the United States of America will hold its annual meeting July 11, 12 and 13 at Chicago, Ill. Secretary, J. W. Paul, 4800 Forbes St., Pittsburgh, Pa. Announcement regarding headquarters will be made later.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, Editor

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Fair Prices

EXTRAORDINARY conditions warrant extraordinary procedure. Most extraordinary are the conditions faced by Secretary Hoover when he undertakes to hold in check coal prices, and the most blasé will concede that he has handled the situation in an extraordinary manner. Prices, rapidly climbing to panic heights, were steadied by Mr. Hoover's announcement of two weeks ago that at the request of the President he would seek to call a halt. It was expected that the operators would be asked to take control of the problem as theirs, and this they had promised to do. But Mr. Hoover finds that under our laws it is as improper for coal operators to agree to put the price down as it is to agree to put it up.

With marked courage and resourcefulness he has taken on himself the full responsibility for a schedule of maximum "fair" prices for bituminous coal. The announced prices are not "fixed" in any sense of the word, for, as Mr. Hoover has stated, he has not a shred of authority or of law for fixing prices or controlling distribution. These prices are simply his notion of what under all circumstances the operators in the several fields now producing coal are warranted in charging for their coal. Except as individuals meeting with the Secretary of Commerce no coal operator has been asked or allowed to agree to settle on any price for coal. Mr. Hoover takes full responsibility for the figures named, as a duty becoming his office.

Certainly no producer can complain that the prices are unfair to him. They represent practically the top of the market today. They are extremely liberal to the operator who is able to produce; they should encourage increased output and likewise, because they stabilize the market, should encourage buying.

No one will contend that the announced prices have a very close relation to costs. It was plainly stated by Mr. Hoover that the public is interested in dollars and not cents—in other words, this is no time to haggle over fine distinctions of costs and margins. The present is a temporary situation. Circumstances in no wise parallel those under which the Fuel Administration fixed prices. In short, it is the stoppage of the upward surge of prices at a reasonable level. To have gone on, ascending perhaps to $5 or $10, would have cost the consumers millions of dollars.

The action of Mr. Hoover was timely. Instead of waiting until it became necessary to call for a retreat, he stepped in at a time when it was much easier to obtain acquiescence from the operators. Consumers might take it better were the prices adopted a recession from the market and representing therefore more obviously the saving they actually will prove to be.

Will the plan work? There can be no assurance that it will. Everything depends on those who sell or who buy and sell coal. There is no law, the clever or crude circumventing of which would, as in war time, stimulate imagination and incite cupidity.

Violation of the implied agreement between Secretary Hoover and a majority of the coal producers will be nothing less than betrayal of the best interests of the coal industry.

Where the Jobber Comes In

IT IS well that Secretary Hoover intends to follow up his conference with the producers of bituminous coal on matters of price with similar conferences with the jobbers and retail dealers. No well-informed individual any longer holds that the jobber is an excrescence on the coal trade. His services are just as essential as those of any other part of the industry. Because the jobber—the free-lance trader as distinguished from the regularly connected sales agent—lives by guessing on the market he is the one whose activities the more frequently attract attention when prices are high. His part in distribution is important, however, and he doubtless has felt slighted that no recognition was given him in the prices announced in Washington last week. He might be expected to have become calloused in that respect in view of the treatment he was accorded during the early days of the war period. Or he might have known that his turn would come.

The prices announced by Mr. Hoover last week are mine prices and the producer is going to hold out for the entire amount, despite the assertion that they are supposed to include a fair share for selling. The jobber who tries to buy coal will find that he is a buyer, and to the buyer the price is $3.50. He must look elsewhere for his commission. If the Hoover prices are fair prices for the producer, then the jobber who buys for the account of a consumer, in hand or in the bush, should, it seems to us, be entitled to add his commission. This was 25c. according to the Lane-Peabody schedule and quite generally 15c. under the Garfield régime. If our war-time journey into price regulation taught anything, it is that there is no other way to take care of the wholesaler.

Time to Break the Anthracite Deadlock

IT WILL soon be three months since the anthracite operators and miners began to negotiate a new wage scale. So far as the public has been let in on the proceedings the net result has been that the miners have informed the operators that they are striking for a 20-per cent wage increase and the operators have said to the miners that they can have no such thing; that they must in fact take a 21-per cent wage decrease. There is not the slightest indication that either side has any intention of conceding an inch.

By the end of this month the hard-coal mines will have been idle a quarter of a year. Since 1916 it has required almost full-time operation of these mines to meet the needs of the householders who depend on this kind of fuel. Therefore there is certain to be a shortage of anthracite this winter. The outlaw strike in the summer of 1920 that affected but a portion of the miners for less than a month resulted in a shortage sufficient to produce $15 hard coal at the mine in ensuing months. True, very few tons were sold by operators at that figure, but those who held up the buyer two years ago are still in business. Sufficient independent high-cost tonnage will be put on the market this winter to create a scandal and lend color to the charge that the whole industry is profiteering.

The anthracite operators have a public necessity in trust. They have spent nearly three months in fruitless negotiations with the miners. There is no non-union production; no substitute on which the public may rely. Work in the anthracite mines must very soon be resumed. Strategy, politics, reasoning, argument, have all had their opportunity and have availed nothing. The public wants hard coal and it wants cheaper coal. The sliver of from a quarter to less than half a dollar shaved off by the reductions in freight rates will not satisfy. The public thinks in terms of dollars and wants at the very least a dollar off the price of its coal. The 20-per cent reduction in wages urged by the operators should take a dollar off the price.

It is suspected that John Lewis and the international officers, having their eyes on the larger stake in the bituminous-coal situation, are holding up the settlement in the hard-coal region. Were the hard-coal men to get back to work, and particularly at a reduced wage, as eventually they most certainly will, the effect on the morale of the striking soft-coal miner might be far from what Mr. Lewis would like.

There is a suspicion, too, that some at least of the operators have been and are in no hurry to open their mines in view of the general slackness in the public's buying last winter and this summer—in other words that a partial suspension of mining would have been inevitable this summer from lack of market, even if there had been no strike. This hand can be overplayed. July 1 is about the latest date at which operations may be resumed and really serious trouble be avoided next winter.

The deadlock can be broken, and very quickly. Were either party to appeal to President Harding, stating that there is no solution save by arbitration, the other party must most certainly accede. The miners are openly opposed to arbitration. Should they break off negotiations, and perhaps by the time this is published they will have done so, the operators should act quickly in the direction of Washington.

Peace Enough and No More

"THERE must be no violence," was the union order with which the strike commenced. No one is destroying idle mines, no one assails men who do not meditate going to work, whether union or non-union. But "scab mines" and "scab workmen" in strike districts are being attacked just often enough and regularly enough to keep those who would work or would hire men to work duly afraid of what might happen to them and their properties. It is remarkable how effectively the sparse violence used prevents mine operation.

In Europe it is customary to put in troops and police before violence is resorted to. Here the plan is to wait till the mine is wrecked, the men terrified, driven out or killed. A previous administration, when the situation became serious in Colorado, sent in troops to preserve the *status quo*. What mines were closed were to remain closed; only men who were being employed were allowed to work; what victories intimidation and crime had won were to be respected by the federal government. It was a travesty of justice—this pious respect for the *status quo*.

One questions how the cities would prosper if they provided no police force till a bank was bombed or a mob looted a grocery or destroyed a factory. Conditions at the mines are unbelievable. What order there is shows that at most mines there are more good than bad miners, for the "preservation of the peace" till peace is shot to smithereens by armed rebellion or dynamite is ludicrously inefficient, except indeed where the company induces the sheriff of the county to hire armed guards at the company's expense.

Heavy Cost of the Open Torch

WHO can summarize the loss resulting from the cap lamp with an open flame and who shall estimate the losses of the future from this same cause? Is it a mere blind guess that places on the miner's open flame the onus of many of the mine conflagrations of recent years?

Our mines are getting further and further from the outcrop. They are becoming drier and yet more dry as the years pass by. With greater depth comes increased heat and less surface water. With better drainage comes greater dryness. The dangers of greater depth are found not alone in the open torch, for an increase in depth also makes spontaneous combustion more frequent and more active. This is because weight and crushing make the coal liable to burn spontaneously, and coal unoxidized or less oxidized than that nearer the surface is likely to ignite from causes not attributable to flame. Electrification also has its dangers. Yet despite all these various causes of ignition the open torch is often blamed, and with reason.

Among the accidents caused by an open flame may be numbered Delagua, Cherry, perhaps also Sunnyside and Red Ash. It seems almost certain that the Hollenback fire came from an open torch, and the Baltimore tunnel flare-up quite possibly had a like origin. For this reason it is to be hoped that the electric portable lamp will become more effulgent and its use more general. It cannot start a fire, whereas the open flame can and often does.

One of the big economies of the future probably will be the electric lamp. It is being given a greater candle power, and in the future it may be made less heavy. It probably would have been far more generally adopted had not the ownership of the open torch by the miner caused him to oppose the introduction of a lamp for which he would have to pay a power and maintenance charge. Only the fact that the miner has his own lamp, and supplies the fuel for it, has delayed the introduction of the electric lamp.

If the union would permit in every case, as it has in some, a slightly lowered rate for mining where the mine worker saved the lighting charge formerly borne by him and the operator supplied electric lamps, the electric lamp would speedily come to the front

Plastic Fuel Can Be Made of Low-Grade Coal and Oil And Can Be Coked Even if Non-Coking Coal Is Used

With Fine Grinding Almost All But Inherent Ash Is Removed by Trent Process—Ash May Be Reduced to One Per Cent—Amalgam Produced Twice as Much Gas as Ingredients Separately

By George H. Dacy
Washington, D. C.

After much experimentation, Walter E. Trent, a metallurgist of Washington, D. C., has developed a process for producing a satisfactory and economical plastic fuel from low-grade and waste products such as impure lignite, anthracite culm, the waste coal dumps around bituminous mines and municipal ashes. This process removes the coal ash and prepares a fuel that has been termed with some propriety an oil amalgam.

Experiments on this process began during the world war, when, at the instance of the War Department, facilities were provided by the U. S. Bureau of Standards for the making of tests to ascertain how the ash which slags and interferes with the combustion of coal could be removed from the fuel when in powdered form.

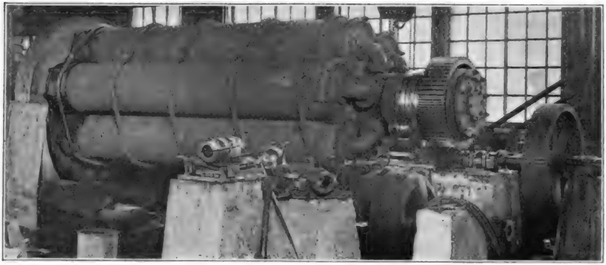
After peace was concluded the investigations were continued, with the ultimate result that the Trent process of agitating or beating together powdered coal, water and oil to form a plastic fuel was devised. This fuel has been investigated and a report made on it by the U. S. Bureau of Mines.

Though, up to the present time, the work has been largely experimental the process exhibits great possibilities in the solution of troublesome problems in fuel and gas manufacture. The officials of the U. S. Bureau of Mines declare that already a half dozen ways have been discovered in which the process might be applied

General View of Mill

Showing amalgamator screen and ash tanks. The coal is treated with 30 or 40 per cent as much oil as clean coal substance. This oil, remaining with the coal, is available for either combustion or distillation and so in no sense is lost. The oils used are of inferior grade.

NOTE—The frontispiece shows a stockpile of amalgam at the dock at Alexandria, Va., ready for shipment to consumers of the product.



BALANCED PULVERIZER OF ROD-MILL TYPE

This mill, which grinds the coal to a fine powder, carries 30,000 lb. of crushing rods which roll on the coal as the nest of tubes revolves.

to the solution of the intricate technical problems of many industries.

To quote Mr. Trent's own language: "Wet, pulverized coal suspended in water, when treated with about 30 or 40 per cent as much oil as there is coal substance present, agglomerates into a pasty, plastic mass in which all the coal ingredients and the oils are intimately united. The ash, which is separated mechanically from the coal particles as a result of fine grinding, does not enter into the coal-oil mixture but remains suspended in the water and can be readily separated from the fuel paste. A purified fuel material results.

"This is practically free from objectionable moisture and is extremely low in ash content. The excess water contained in the plastic fuel is removed by mechanical manipulation similar to that which frees water from butter. This is done by agitating the coal, oil and water with paddle blades rotating at a speed of 1,000 r.p.m.

"By these means the ash-content can be reduced to as low as 1 per cent of the treated fuel although sometimes it runs around 2 to 3 per cent and under certain conditions is as high as 6 to 8 per cent. The quantity of ash depends on the fineness of grinding and the character of the ash itself. All the ash which is inherent in the coal or which is not mechanically sepa-

Amalgamator and Screen

Where coal, oil and water are mixed. When the mixture has been allowed to settle the coal and oil remain as globules in the water, forming the marketable product. The slaty particles fall to the bottom, leaving the amalgam with only the impurities inherent in the coal and oil, which impurities are, of course, comparatively insignificant. The cleanness of the product depends on the fineness of the grinding and the inherent freedom from ash of the original vegetable material from which the coal is formed. The proportion of ash may fall as low as 1 per cent.

Amalgam Discharge Belt

Note the pile of amalgam on the floor of the building. The plant is designed to handle 1,000 tons of raw coal per day and to test coals to ascertain their availability for the manufacture of amalgam. Coals, such as lignite and culm, containing 30 to 40 per cent ash have been treated by this process. The amalgam may be burned either as a liquid fuel, being sprayed into the furnace by special burners onto a grate for final combustion, or as a solid fuel, being fed onto a mechanical stoker.

rated from the carbon particles remains with the fuel substance."

An unusual feature of this process is that it will treat with efficiency both coal of low-ash content and low-grade fuels, such as lignite and anthracite culm, containing from 30 to 40 per cent of ash. Both give satisfactory amalgams of coal and oil. Such amalgams can be used as liquid fuels and be blown into the furnace through special burners, the preliminary combustion occurring while the fuel is in suspension and the final combustion being effected on the grate. The amalgams can be burned also directly by means of one of many types of stoking equipment. At present the amalgams are being made and sold on a commercial scale in a plant operated at Alexandria, Va., designed to handle 1,000 tons of raw coal per day. At this plant not only is amalgam made for commerce but all types and varieties of coals are being tested in order to ascertain their availability for use in the production of improved amalgams.

CHEAPEST GRADE OF OIL AS EFFICIENT AS BEST . . .

A great variety of oils can be employed successfully in the commercial production of plastic fuel. Experimental and practical results, however, show that gasoline, kerosene, benzol and other high-priced oils are no more efficient or satisfactory than the crudest and cheapest of petroleum products. Any oil or organic liquid may be used which will not mix with water and which is not of excessive viscosity.

In many instances oil emulsions which for other uses were almost valueless have been utilized successfully. The indications are that the majority of the waste liquid fuels can be combined in this process with waste solid fuels to make commercial amalgams valuable for heat generation or for the manufacture of producer gas. The amalgams may be handled in several different ways. They can be shoveled like coal or they may be forced through pipes by pressure. If desired they can be stored under water.

This process is particularly efficient because in it the fuel is ground wet. Furthermore, the fact that the ash content can be measurably controlled makes available many types of coal that were practically valueless prior to the inception of the new process. If an oil is employed which distills at a lower temperature than coal, powdered fuel may be reclaimed from the amalgam and the oil may be used again. On the other hand, if a heavy oil is used and the amalgam distilled to a coking temperature, a satisfactory coke product may be recovered despite the fact that the original coal may have possessed no coking qualities. The possibilities of this process solely in the way of coking the otherwise non-coking varieties of coal are unquestionably large. In case the original distillation is continued only to the point where a heavy pitch results, the mass may be used for briquet making. It is believed that in this way coal briquets may be made and sold at much lower prices than those which now prevail.

Tests of government experts have demonstrated that a greater quantity and a better quality of distillates such as tar, coke and the like can be made from powdered coal and oil in mixture than can be obtained from these same materials separately. Graphite ore can be separated readily from the non-metallic minerals occurring with it in the ore deposit and coke can also be separated from flue dust by the same means. Hitherto, such separations have been complex and baffling riddles. Even the clean coal contained in anthracite sludge will make a satisfactory amalgam if sufficient oil is added. This process is highly efficacious also in the removal of excess sulphur and combinations of iron and sulphur from coal, particularly anthracite.

In the government investigations of this process approximately 0.3 lb. of oil was used to every pound of dry, clean coal. Where the coal is pulverized to a fineness such that it will pass readily through a 200-mesh screen a mixture of 62 gal. of light fuel oil to 450 lb. of coal will produce an amalgam in granules about ¼ in. in diameter. Where more finely ground coal is used, it is sometimes necessary to employ about 0.4 lb. of oil per pound of coal.

Generally it is preferable to use as small a quantity of oil as possible, for the amalgam can be washed more completely if its granules are small. Furthermore, under such treatment the resultant cleaned coal contains less ash. The quantity of oil retained in the refuse rarely if ever exceeds 1 per cent of the total quantity used and frequently is so small as to be entirely negligible. Where the heavier petroleum oils are used the evaporation losses are so small as to be of little consequence, but are quite appreciable where gasoline or benzol are employed. However, it is not expected that these latter materials will be used in any commercial application of the process.

Some of the amalgams of heavy petroleum oils and finely pulverized coal produce a denser grade of coke than can be obtained directly from the coal alone. Even anthracite when properly treated with the oil will yield a good grade of coke. Thus this process may be made a means of efficiently using low-grade asphaltic oils and of concurrently producing coke—useful as a domestic fuel—from inferior non-coking coals.

MORE COKE, GAS AND HEAT FROM AMALGAM

When these amalgams and grades of oil and coal similar to those used in making them were tested at the Bureau of Mines' laboratories it was found that the residue from the amalgams was of fair quality and 10 per cent greater in quantity than those obtained from the separate ingredients, which when carbonized did not form suitable coke. The amalgam yielded over twice as much gas as the coal and oil distilled separately and the heating value of this gas was 5 per cent greater.

Mr. Trent is now busy perfecting a commercial method for making a new variety of cheap and satisfactory coke that may be used for domestic and industrial purposes. Patents are now being filed on this new process, which reduces the cost of coke manufacture one-half and lowers the total investment to one-fifth of the outlay necessary where production is attempted under the ordinary methods of manufacture. In this new process the amalgams are placed in huge caldrons or pots and after vertical holes have been bored through them their containers are placed directly over gas burners which initially are operated at low temperatures in order to drive off the oils and other volatile products. After this has been done the temperature is increased until finally the amalgams are converted into coke. By midsummer a large commercial plant for the production of coke from such amalgams, located in northern Virginia near Washington, will be in active operation.

TESTS RECENTLY WERE MADE at the Pittsburgh (Pa.) experiment station of the U. S. Bureau of Mines of the explosibility of coal dusts from the Cassidy mine at Cassidy, Vancouver Island, B. C. The tests were made in order to compare the explosibility of these dusts with Pittsburgh coal dust.

TWO SERIES OF STUDIES have been undertaken at Pittsburgh, Pa., by the U. S. Bureau of Mines in connection with electrical shotfiring methods in mines. The first problem is the relative danger of firing shots with iron and copper "leg" electric detonators, which has a possible bearing on the mine fires reported in the Utah field. The second problem is the cause of mis-fires in the firing of a large number of series shots by push-down type blasting machines in places where the leakage current through the earth is excessive.

Central Power Station Fired with Peat

BY G. T. ZIMMER
London, England

PEAT as a fuel for power-house boilers has not only been much discussed in Germany but has actually been tried. The peat deposits of Germany are estimated to be about ten billion tons, the usable half of which would be sufficient to provide fuel for the complete light and power needs of Germany for 150 years. Before the war, peat at 5,760 B.t.u. and at a cost of 95c. per ton, could compete with coal at $2.85 and lignite at 71c. per ton.

The power plant of Wiesmoor, in Bavaria, was the first to burn air-dried peat, which was gathered in the immediate vicinity. This plant has a maximum capacity of 7,000 kw. and during the winter of 1917-18 it generated about 15,000,000 kw.-hr. with a peat consumption of about 23,500 tons, in addition to about 11,900 tons of coal.

Possible sites for future peat-burning central power stations are: Zehlaubruch, in eastern Prussia, with a peat deposit sufficient for forty-five years, generating four hundred million kilowatt-hours per annum. This would be sufficient for the needs of the whole of eastern Prussia.

A further station has been contemplated for Leba Moor, in Pomerania, with a capacity of thirty billion kilowatt-hours; and another at Friesland, of twelve billion kilowatt-hours. A smaller installation in the Havelland, for the electrification of the Berlin Ry., also is under consideration. In all there are seven proposals for the erection of central power stations in close proximity to peat deposits. In each of these peat will be used as fuel either alone or with coal.

Stowing Slack in Gob of Lancashire Mines

A QUESTION raised by Stephen Walsh in the British House of Commons reveals the difficulty in disposing of slack in British mines and the waste of good coal which takes place in consequence. About Christmas, 1921, the Parr Colliery in Lancashire, unable to dispose of its finer coal, ordered that the slack made in some of its workings be stowed, the delay in placing slack making it possible to work only two or three days a week. By leaving a certain percentage of slack underground the running time has been raised to four or five days. The coal is either screened by hand riddles, or screens, 20½ in. in diameter with a ¾-in. mesh or loaded with forks.

Question was raised as to the safety of the practice. A divisional inspector who visited the mine declared the work unobjectionable, as it did not put any more dust into the air and onto the main roadways than was suspended in the operation of coal-cutting machinery with the loading thereafter. It also was questioned whether the coal thus stored might not ignite spontaneously, as the Ravenhead Main Delph had been troubled at times by such combustion. It was said, however, that no instance of spontaneous combustion had occurred there or in any other seam of the Parr Colliery for thirty years. When fine slack is loaded onto cars it tends to be blown off and it keeps the roads dusty. With only coarse coal on the cars this danger is obviated. It may be noted that this mine has been rendered less susceptible to a dust explosion by the use of stone dust.

What Precautions Should Be Taken to Keep the Control Devices of Mine Locomotives in Good Condition—I

Three Points to Be Noted as to Condition of Trolley Pole—Lubricate Contact Fingers with Vaseline, but Not in Excess—Wood Drum Cleaned and Shellacked—Smooth All Pitted Fingers and Contacts

By H. H. Johnston
East Pittsburgh, Pa.

UNDER the head of control equipment for mine locomotives is included all devices for governing the electrical circuits from the trolley wire to the rail. It usually embraces trolley, controller, fuse boxes, circuit breakers, transfer switches, headlight equipment, grid resistors and in fact all electrical devices except the motors themselves. Each of these contains a wide range of separate devices needing careful attention. For example, the trolley includes mainly the wheel and its bushings, the use of which must be watched closely, yet the trolley pole, although it need not be frequently inspected, must be watched and its condition occasionally noted, for during the day's work the wood may be broken or split. The tension of the trolley or the pressure of the wheel against the wire should be noted, and the tension spring in the trolley socket adjusted if necessary. The socket itself should be kept lubricated, so that the pole may swing freely, thus allowing the wheel to follow the wire throughout the limits in which it may be satisfactorily operated.

The controller has many intricate parts that need attention from time to time. These consist mainly of the drum contacts and fingers, which are subject both to mechanical and electrical wear. The controller-finger tensions should be checked and adjusted to limit the drop of the fingers when leaving the drum contacts, also to prevent the fingers from "stubbing" when approaching these contacts. Contacts and fingers also "pit" from time to time. This pitting may be corrected by dressing them with a file, as this action takes place from day to day. This procedure will often eliminate much trouble later that may be experienced if the pitting be allowed to continue untouched.

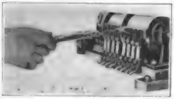
Proper Pressure for Controller Fingers

Controller fingers are designed to provide the correct contact pressure, and it is important that in service the recommended pressure shall be maintained as closely as possible. The pressure between fingers and drum contacts and the current-carrying capacity of the joint thus made will depend largely upon the metal in both the finger tips and contacts. The usual practice is to use copper for both, particularly where high current-carrying capacity is desired. The usual pressures recommended for copper fingers on copper contacts for maximum capacity are: ¼-in. fingers, 2 lb.; ½-in. fingers, 4 lb.; ⅝-in. fingers, 5 lb.; ¾-in. fingers, 6 lb.; ⅞-in. fingers, 7 lb., and 1-in. fingers, 8 lb.

With these pressures, which it will be noted equal 8 lb. per inch of finger width, each of the finger sizes will have recommended current-carrying capacities that will vary for arcing and non-arcing duty, the arcing duty being that secured when the arc is blown out by the action of a magnet. For example, a ½-in. finger for arcing duty, with blowout, may have a rating of 50 amp., whereas for non-arcing duty and continuous service it probably would be rated at 65 to 75 amp. Fingers for arcing duty are used at the main drum of the controllers, whereas those of the non-arcing type are used on the reverse and series-and-parallel drum. Fingers in arcing duty are subject to heat and burning when the circuits are broken between the drum and finger tips. These fingers require more attention than those of the reverse and series-and-parallel drum.

In most up-to-date controllers used on mine locomotives with arcing duty the main-drum contact tips are designed so as to be removable. This makes it possible to renew these parts when badly burned or worn, without putting in an entire drum segment. By such renewals maintenance is reduced to a minimum.

If the drum contacts are not lubricated at the point where the fingers slide over them, or if they receive little regular attention, the fingers and contacts wear away more rapidly than they do when these parts are properly lubricated. The lubricant employed must be a heavy grease, such as vaseline, that will cling to the drum contacts for a reasonable length of time. Too much of this material often is applied and this has a bad effect upon other parts of the controller, particularly on the insulation at the drum and the arc barriers.

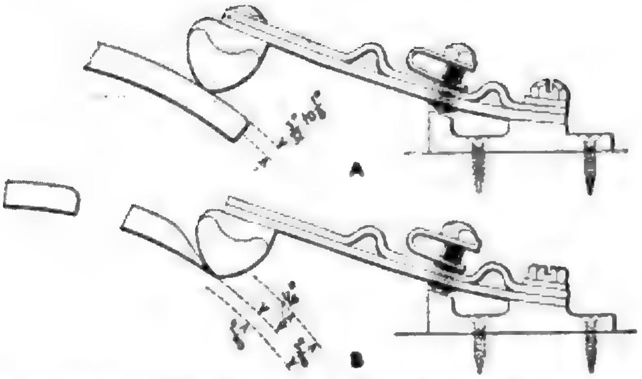


TESTING CONTACTOR PRESSURE
Each contactor is separately pulled out by a spring balance and the resistance observed.

Only a small quantity of grease is required for each contact and by rubbing it onto the contacts with a clean cloth or piece of waste so as to apply only a thin layer, excellent results can be obtained. By operating the controller drum several times the lubricant will be evenly distributed over the surface, after which any excess can be cleaned from the fingers and ends of the contacts. Excess lubricant gathers dust and other foreign matter and is as bad as, if not worse than, none at all.

Controller arc barriers are subjected to the intense heat of arcs and the throwing of molten copper from fingers and contacts. Fine copper thus will be deposited on the arc barriers. At regular inspections these parts should be cleaned to maintain the insulation necessary, the deposited copper and all other foreign matter being removed.

Almost all controllers used on mine locomotives of present-day and older types are provided with a wooden



FINGER SPRING WITH STOP TO PREVENT STUBBING

A stop is provided so that the contact finger cannot drop excessively, for when it does, it tends to stub and break the finger spring.

drum upon which the reverse contacts are held by means of screws. The wood should be kept clean, and at every overhaul period or during heavy inspections these drums should be inspected thoroughly and resurfaced with shellac or non-conducting paint. Improper finger pressure or bad contact due to unclean or pitted surfaces causes excessive heating, which sometimes chars the wood little by little. This will undoubtedly lead to much trouble, sometimes causing grounding of the circuits and destructive flashes.

Sometimes in repairing control drums the screws for holding the contacts to the drum are placed in a position different from that originally intended. Care should be taken to avoid this, but when it is done the screws should be located so that the fingers in making contact will not rest on or over the screw heads, which usually are countersunk so that the contacts will have to wear down considerably or as far as the screws before the fingers begin to wear in passing over them. These screws usually are of brass, consequently they are harder than the copper finger tips.

In making a jumper connection between contacts on drums a strap is always preferable to a cable. Such a strap or jumper should be permanently attached by sweating and screwing in place. Attempts never should be made to connect a jumper by merely placing its ends under the drum contacts, depending on the pressure of these parts to hold them together. Neither should screws only be employed to connect jumpers to the contacts without sweating. Where the wear is not great, it is often desirable to combine the jumper with its contacts, cutting them to shape from a single piece of copper.

In measuring finger tension a handy equipment consists of a U-shaped tool or stirrup. This is so constructed as to go over the end of the contact finger, which may be of any size up to 1 in. in width. After putting this in place and attaching a small spring scale, the finger-spring tension is measured by pulling in a direction radial to the drum. Such a device can be quickly used and changed from one finger to another. It also is a highly accurate means for checking tensions as well as for aiding in good maintenance.

The finger drop and pressure of contact bear a close relation to each other. A finger having too high a pressure will drop, when leaving a contact, enough to cause stubbing. This not infrequently results in breakage of finger springs. A stop is sometimes provided in controller-finger mechanisms to prevent the fingers dropping past a fixed point. This reduces the stubbing and breakage. The drop from the contacts will vary from 1/16 in. to 1/8 in. (See illustration.) Usually this will be ample, and when a finger is on a contact it will not rest on the stop.

In maintaining controllers it is important that they be subject to frequent inspection, that records be kept of renewals, that the drum contacts be lubricated to prevent excessive wear; that insulating parts be kept clean, that moisture be excluded so as to protect the insulation; that the bearings be maintained to prevent loose drums, eccentricity, unevenness in the pressure of contacts and stubbing of fingers; that the contact pressure be kept up to standard; that the fingers be prevented from dropping excessively; that arcing tips be kept in condition (that is, clean and smooth), that they be renewed before they are allowed to burn the main contacts; that arc barriers be kept clean and free from such accretions of copper, smoke and grease as may fall from the drum contacts; that the wiring of the controller be maintained in good condition and free from dust, oil, copper and other foreign material, and that the controllers be blown out with clean, dry, compressed air, wherever this is available.

Belts Badly Repaired Soon Break Again

By W. F. Schaphorst

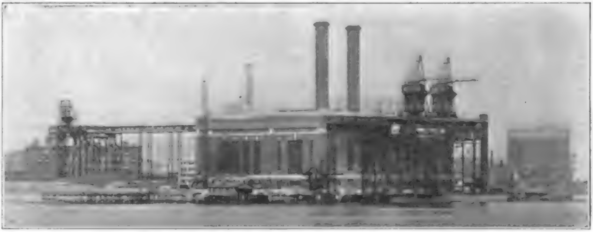
NOT long ago I was called upon to inspect an engine that the owner wished to dispose of because it "gave him too much belt trouble." He admitted that the engine itself was perfectly satisfactory. He could find no fault with it as far as its operation was concerned, but, he said, "It breaks the belt as fast as I can fix it. I spend most of my time fixing the belt."

Of all the belts I have ever laid eyes on I never saw the equal to this one. I firmly believe that it is not only the "most patched belt in the world" but that it is the "most poorly patched belt in the world." The word "repaired" can hardly be used because it is too dignified a term in this case.

Originally this was a double leather belt. Whenever it broke, the owner would simply take a piece of belting of the same width, lay it over the break, drive some rivets through, clinch them, and let it go at that.

Of course, such a joint wouldn't hold long. Another splice would then be riveted on top of the first, the owner doubtless thinking that two splices should be twice as strong as one. And when that, again, would break, the owner "simply couldn't understand it." He decided that he would have to sell the engine and install a motor.

Never before has it been brought to my attention so forcibly that whenever a belt needs repairing it pays to do the job right in the first place. In this instance if the first repair had been properly made it is quite possible that up to the present time there would have been no need for a second. The joint in a leather belt that has been properly scarfed and cemented is just as strong as the original belt itself. Leather-laced joints, of course, are never as strong as the solid leather, but if in the above case the owner had even laced his belt, instead of riveting it in the unworkmanlike manner described, he probably would have had much less trouble. Wire-laced joints are stronger than those laced with leather and often possess an efficiency of 85 to 90 per cent. A wire-laced joint could have been used in the belt described without serious difficulty and I believe such a joint would have held.



UNITED ELECTRIC LIGHT & POWER CO. PLANT IN THE HELL GATE SECTION OF THE BRONX, NEW YORK CITY

At the front of the boiler house on the edge of the East River are two grab-bucket towers for the unloading of coal, feeding to a cable tramway which delivers coal either to the boiler bunkers or to the storage ground in the rear, where also coal can be received by rail. About 100,000 tons of coal always will be kept in store.

First of New York's Central Plants to Use Sea-Borne Coal; To Store 100,000 Tons*

THE new Hell Gate power station of the United Electric Light & Power Co., illustrated herewith, possesses certain features not found in the general run of such plants. Chief among these are the provisions made for fuel supply and storage.

As may be seen from the accompanying map, this plant, which will have an ultimate capacity of 300,000 kw., is located at the entrance of Long Island Sound, where an abundance of condenser water may be readily obtained. It is only a short distance from the center of the present electrical load of New York City, and this distance probably will decrease somewhat during the next few years. Four turbines with an aggregate capacity of 150,000 kw. now are in operation, using steam at 250-lb. pressure and 200 deg. F. of superheat.

Fuel may be received from two separate sources and enough coal—about 100,000 tons—will be kept in storage to supply the plant for four weeks' operation if all supplies are cut off. Normally fuel will be received in 10,000-ton ocean-going barges, from which it will be unloaded by means of grab-buckets operating from towers and fed to a cable tramway, by which it will be delivered either to the boiler bunkers or to storage. It will be reclaimed from storage by a dragline scraper. Coal may be received also by rail, be dumped and placed either in storage or in the bunkers by the same means as have been mentioned, except that a locomotive crane is employed in place of the coal towers.

This is the first central station in the metropolitan district to be equipped for receiving fuel direct from deep-sea vessels. The facilities provided will permit this plant to receive fuel normally from such ports as Hampton Roads, but, should the necessity arise, it might be imported from England or elsewhere with equal ease. Its rail connections afford a further safeguard against shutdown.

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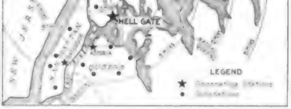
*Abstracted from *Electrical World* of April 29, 1922.



HELL GATE PLANT CAN GET ITS COAL BY SEA OR LAND

This plant is the first in New York to sense the advantage of being able to get coal direct by boat from the non-union fields of West Virginia and Virginia or even from Great Britain if need be.

Timber Preservation Grows in Importance

INCREASE in demand for permanent timber structures is shown in a recent report of the Service Bureau of the American Wood Preservers' Association. Over 2,400,000,000 board feet of timber for various purposes were pressure-treated in 1921 by the 122 wood-preserving plants in operation throughout the United States, thereby surpassing the 1920 record by nearly 17 per cent. Approximately equal amounts were treated with coal-tar creosote and with zinc chloride.

To treat this wood 51,375,360 lb. of zinc chloride, with an absorption of one-half pound per cubic foot, and 79,384,326 gal. of creosote, with an absorption of 5 to over 20 lb. per cubic foot, were required.

Ease of handling and the permanance of well-treated wood at low cost are given as the reasons for the increased demand. The proper use of a wood preservative adds a new quality to timber which enhances its value as a construction material.

The material treated consisted mainly of construction timbers for wharf, bridge, highway, mining and building purposes, piling, telephone and power poles, ties, fence posts, wood blocks for street paving and for factory floors, and timber for miscellaneous uses.

J. E. TIFFANY, ASSISTANT EXPLOSIVES ENGINEER of the U. S. Bureau of Mines, now in Europe, has been authorized by the Secretary of the Interior to inspect the mining and explosives experimental stations of England, in order to compare their methods of testing with those used in the United States. Mr. Tiffany also will study the use of permitted explosives in British coal mines.

Design of a Concrete Fan Housing Equally Efficient for Blowing and Exhausting

By F. C. Cornet
New York City

THOUGH to be classed among the many improvements projected but delayed by the present business depression, the fan the general design of which is shown in the accompanying illustration is worthy of consideration. The housing of this fan as well as the engine room and boiler house adjoining it are cast integral of reinforced concrete. The heaviest pieces in the skeleton, or reinforcing, are 8-in. I-beams.

The ventilating current set up by this fan can be reversed promptly and with entire safety to the men employed in making the reversal. This is accomplished in a manner and by a means readily understood from an inspection of the drawing. The design is such that the efficiency of the fan is the same whether blowing or exhausting. Most installations attain maximum efficiency with either one or the other system of ventilation; that one in fact in which they have been designed primarily to operate.

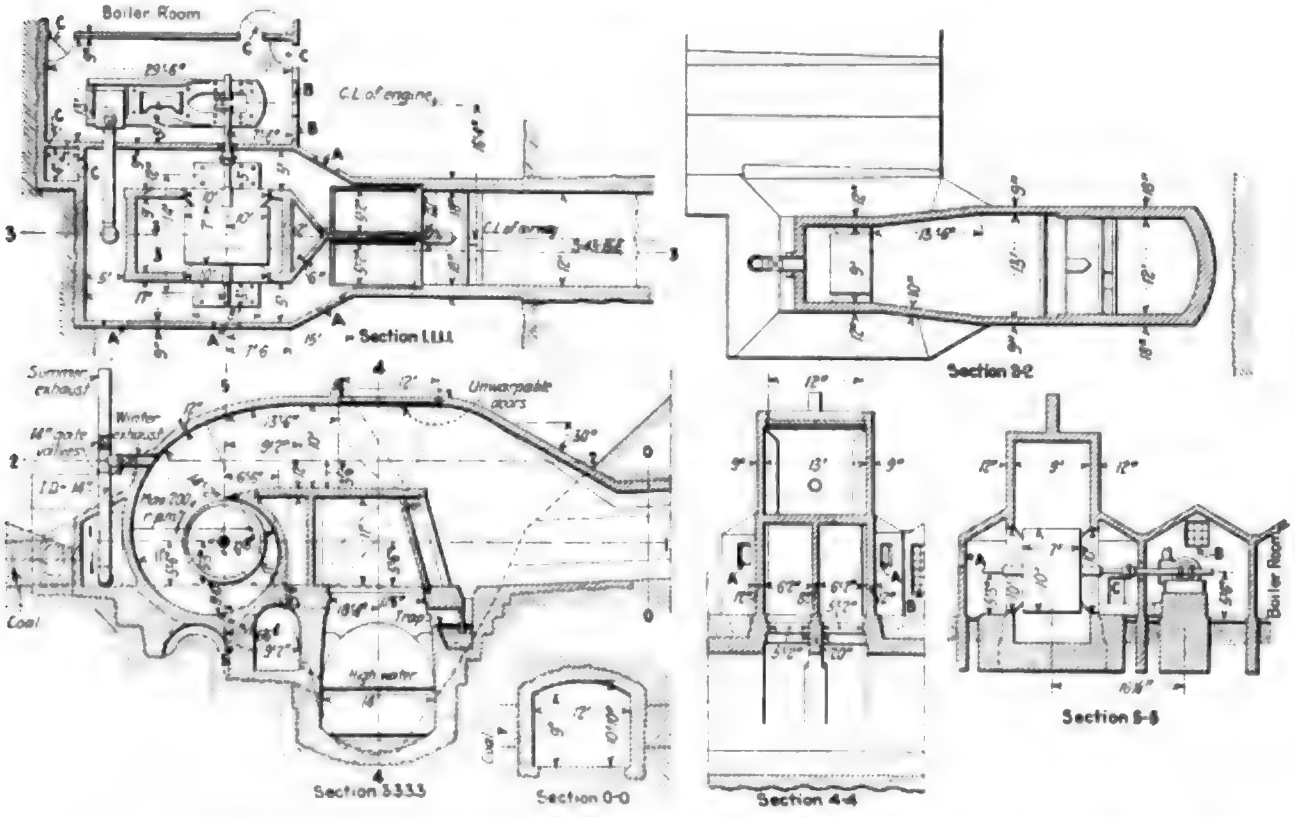
In summer this fan will be operated as an exhauster and in winter as a blower. When so used the exhaust of the 28 x 24-in. driving engine will be turned into the ventilating current, warming the air and imparting to it a certain amount of water vapor and humidifying it to this extent. The discharge of this steam is made in the direction in which the air current is moving and in such manner as to assist the action of the fan and boost the current.

Any steam that may have condensed in the air and not absorbed by it together with any water that may run out from the mine workings through the air course reaches the outside by way of a concrete trap through a water seal that effectively prevents air leakage.

It is estimated that the capacity of this fan when operating at 180 r.p.m. will be 350,000 cu.ft. of air per minute against a 4-in. water gage. In the accompanying drawing the windows marked *A* are to be of plate glass in which wire is embedded. They will be set tightly in copper frames yet will be easily removable, so as to ease the work of the fan when blowing. The windows, marked *B*, will be of glass and the doors, *C*, will be of steel. The internal doors for reversing the air current will be made up of hollow brick laid in steel frames. They will thus be unwarpable.

Though concrete-housed fans have not been entirely unknown hitherto, they have not been installed as frequently as their permanency would appear to warrant.

Inefficiency in Mine Fans Due to Change in Equivalent Orifice.—At the North of England Institute of Mining Engineers, Samuel Hare remarked that not 50 per cent of the fans working in Great Britain were operating efficiently. When a fan is designed it is planned to suit a certain equivalent orifice and as the mine grows larger that orifice naturally changes. Consequently, if the fan is designed correctly in the first place it must, afterward, as a result of changes in the mine itself, become quite inefficient. Mr. Hare declared that where the equivalent orifice had changed he had replaced fans with others half their size, and obtained better results thereby.



CONCRETE HOUSING FOR FAN, WITH DUCT FOR MINE WATER AND PIPING FOR EXHAUST STEAM

The capacity of the fan at 180 r.p.m. against a 4-in. water gage is 350,000 cu.ft. per minute. The volumetric ratio is 280. Windows, *A*, are to be wired plate glass tightly set in copper frames but easily removable when blowing; windows, *B*, or doors, *C*, to be of steel and glass only. The unwarpable doors are to be hollow brick laid in steel frames.

Henceforth the Combustion Engineer Will Prove Powerful Factor in the Selling of Coal

Mainly a Psychological Worker, the Fuel Engineer Must Show Skill, Ability to Handle Men and to Make Friends—He Also Will Train Coal Salesmen in the Rudiments of Boiler-Room Practice

By E. W. Davidson*
Chicago, Ill.

KEEN competition in coal selling seems inevitable during the period that will follow the present strike. Coal men generally agree that demand can hardly be expected to equal the supply and consequently the man who sells coal is even now girding his loins and sharpening his wits. Companies big and little are taking a long look into the future, trying to determine their selling policies and preparing to avail themselves of every selling aid possible. One such aid is the combustion engineer—horny handed perhaps, but tactful, and at home anywhere from the ashdump up through the boiler room and the chief engineer's smudgy office to the mahogany-trimmed sanctum of the president.

The combustion engineer has been in the business of helping coal producers sell fuel almost long enough now to be acknowledged as a coal-trade necessity—almost, but not quite. For years he has occasionally been called from the mine's own boiler room and sent out on special jobs such as "finding out what's the matter with our coal in So-and-so's plant." But only recently has he been placed on the payroll with the title of fuel engineer and with a regular and official relation to the selling organization.

Fuel Engineer's Job One Without Precedents

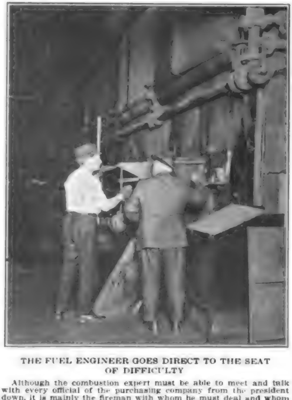
In a large measure he has made good. But it cannot be said that he has done so in every case. There are all sorts of pitfalls for his feet. There are all manner of critics above his head. Like every other pioneer in industry he has at times blazed crooked trails. He by no means can lay a straight course even now. He is still a pioneer. For that reason he is not yet an accepted necessity in the coal-selling business; but he is approaching that goal. He is nearing it with enough steadfastness of purpose to win recognition from many a strong and far-seeing coal company. In the Midwest region, for instance, several of the important fuel interests have given him a place.

The Chicago, Wilmington & Franklin Coal Co. employs S. H. Viall, a well-known fuel engineer. The Old Ben Coal Corporation has Otto Hertel together with a varying number of assistants. The Bell & Zoller Coal Co. employs V. G. Leech, and the Harrisburg Coal Co. has A. Bement on its regular staff. These are the men who have done most of the trail blazing for the fuel engineer now entering the sales organization of the coal business.

And now the fuel engineer is beginning to broaden his service. He is helping to get business, especially from comparatively small coal users, by methods few salesmen are capable of employing. Furthermore as an instructor of salesmen he has great possibilities which few companies have yet realized.

The difficulty encountered by this expert in proving his worth to his company, expressed in dollars and cents, explains why he is not appreciated by every coal concern. Occasionally he is lucky enough to run a test in some large fuel consumer's boiler room which wins a big contract over the best efforts of competing companies. Occasionally also he is able to point out changes in boiler-room methods which, when made, turn a sour customer into a satisfied one, thereby saving much business for his employer. But such cases are more or less unusual. The average experience of the fuel engineer is that he does much skillful work for a fuel purchaser without being able to put his finger on any absolute gain to his company. He knows his employer has benefited by his labors, but, like advertising, his services are difficult to measure concretely.

"One reason for this," explains one of the most experienced of the fuel engineers in sales work, "is that our service is largely psychological. It is not always the actual work we do that counts most. It is fre-



THE FUEL ENGINEER GOES DIRECT TO THE SEAT OF DIFFICULTY

Although the combustion expert must be able to meet and talk with every official of the purchasing company from the president down, it is mainly the fireman with whom he must deal and whom he must "show."

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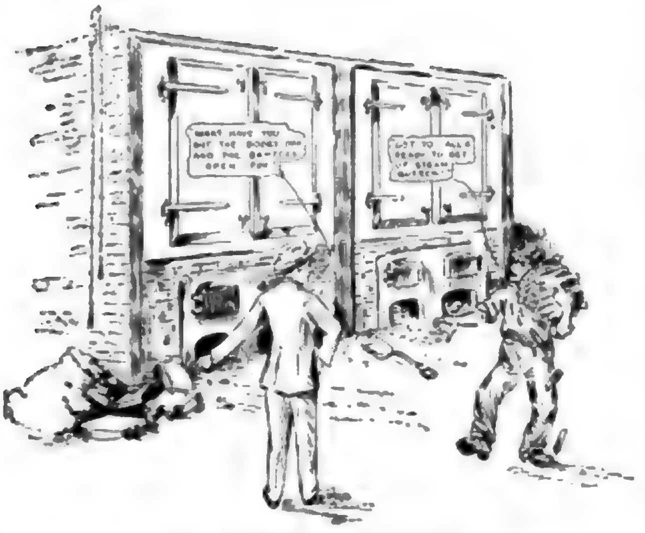
*Western Editor, *Coal Age*.



HOW TONY RAISED STEAM
Many problems confront the fuel engineer—some simple, others complex—but most of them have to do with draft intensity and control.

quently the impression we make that does the business. Take a case where three or four coal companies are bidding against one another for a big contract. Often there is mighty little difference in the quality of the coals. Any one of them, of the correct size and fired properly, would give just the results the consumer wants.

"Suppose the fuel engineer for one of those coal companies goes into the consumer's plant and by his manner rubs people the wrong way and another goes in and wins friends and confidence. If both of them run tests in exactly the same way with exactly the same conclusions, each recommending his own company's coal, who do you think gets that coal contract? The answer is easy.

"I tell you the fuel engineer has to be an accomplished man. He must know how to run a boiler room. He's got to be able to meet all the men in the plant each on his own plane and make them all see that he knows his business and that he has their interest thoroughly at heart. He's got to be a cross between a combustion engineer, an executive and a salesman, with emphasis on the last. Above all he must know men and be able to handle each one right. If he does not, he might as well never go into anybody's plant. He will do his employer more harm than good. He will be psychologically a dud."

It cannot be denied that this veteran engineer knows what he is talking about. There are plenty of instances on record wherein a fuel engineer has gone forth on order from his employer, with instructions to find out why a customer is dissatisfied with the coal he has been getting, only to convert that mildly displeased customer into a rabid knocker whose business is lost forever. He does it, perhaps, merely by entering the plant with a "Here-lemme-show-you-guys" air. He may show them beyond question. The errors he points out may be indefensible and the improvements in boiler-room practice he recommends may be highly desirable; but his company probably will lose the customer just the same.

"That fellow is just throwing a bluff," reports the exasperated chief engineer to his superior, when the combustion man has gone.

"I guess we'll try another coal, just to see how it works," the superior probably tells the coal company. No matter how willing he may have been to continue relations with the firm originally furnishing his fuel, he does not want to match his own judgment on coal against that of his engineer. So the business is lost and months or years of careful missionary work by the coal-selling organization is reduced to naught in one day by the fuel engineer who has exercised insufficient tact.

MUST HAVE "A WAY WITH MEN"

It is extremely difficult to find an engineer gifted with this tact. No matter how thoroughly trained he may be in combustion, no matter how much practical experience he may have had, it is foolish to suppose that any man is so competent that he can walk into any one of a hundred installations and know more about the conditions peculiar to that particular plant than the man who has been running it year after year. Consequently, together with a specialized boiler-room knowledge he must combine "a way with men." Thus equipped he can go into any number of strange plants, put across a good idea here and there and win good will for his company and confidence in its coal.

Occasionally the customer makes the fuel engineer's position difficult. One of the veterans in the business one day was sent out to a small packing plant that had been a regular customer. In that plant a size of coal called "No. 3 chestnut" had been used for a year under contract. It had been a troublous period, but the packer had not complained to the coal company. Instead he took his own engineer's word for it that the coal was below standard. The first the company knew of this was when the displeased packer declined to renew his contract and declared he was going to buy elsewhere. With things in this condition the fuel engineer visited the plant.

"Here, Joe, is the man who's going to show us how to run our plant," was the sarcastic introduction the packing-house manager gave the fuel engineer as he led him into the plant engineer's cubbyhole of an office.

"When he said that," relates the fuel engineer, "I knew just how they all felt toward my company and toward me. I might have quit and gone home right there. But instead I just spent the day winning that engineer, without even looking at his boiler room. The next day I got down to business, but you bet I didn't pose as knowing anywhere near as much about that plant as the dirtiest fireman in it. However, by that time the engineer had an idea I was a pretty good man, so he listened whenever I talked about combustion.

COOKING TANKS CALLED FOR PEAK BOILER LOADS

"They had two 400-hp. boilers, fitted with chain-grate stokers, though most of the time one was enough. Only occasionally, when they needed steam for the cooking tanks, did they attain a peak load too great for one boiler. Well, the engineer had given orders that the men should keep their fires clear back against the water-backs. With such a long fire as that, they had to choke the damper to keep the safety valve from blowing all the time. The result was that all the air that the low draft would take into the furnace came up through that part of the fire bed close to the front, while the fire at the back lay solid against the grates with no air going through to cool the bars. In consequence the grates were simply burning up all the time. Section after section was ruined. The same thing happened with grate after grate. They couldn't understand it, so they blamed the coal.

"It was easy to see what to do. All they needed was finer coal. That would make a fire bed so dense that the little air necessary to run their fires could not all come up through the front part of the grate but would have spread over the whole area. I didn't tell that engineer what was the matter. I led him to it by asking him questions. The first thing I knew he was dashing up to headquarters telling the boss he had discovered that he should be using screenings instead of chestnut. They tried a car. It worked fine and we got the contract for their next year's supply—10,000 tons.

"But did I get complimented for keeping a customer who had decided to leave us? I did not. The salesman in that district was peeved because I got that plant to use coal costing 25c. a ton less. To this day he alleges that I beat the company out of $2,500."

This suggests a great service the fuel engineer can render his company—a service seldom thought of by many coal firms. He can train salesmen with an effectiveness hardly to be equalled by even the best of short courses in combustion engineering. If, for instance, the particular salesman who still protests over the loss of $2,500 of business had understood the rudiments of boiler-room economics he himself might have induced the plant in question to switch from chestnut to screenings without the services of the fuel engineer.

Keenness in future competition probably will require more technical knowledge on the part of the men who sell coal. Where can they get it? Few of them are engineers. Few ever fired a boiler. Some coal companies have tried to drum rudimentary engineering into them during seven-day salesmen's training courses. Too often it does not "take." In the first place the dose is too large for a single treatment. Most of it goes by ungrasped. Secondly, the lessons as they are outlined on the blackboard are too much in the abstract. And in the third place the salesmen, drawn into the city for the week, usually are human enough to devote much of their thought during class to what they are going to eat that evening and to the "show" they expect to see. The conference is more or less of an outing. It is difficult to keep it down to "brass tacks."

Best Place to Learn Is in Boiler Room

"But just let me take one of those fellows out on a job with me," says a combustion engineer whose service to his company has been a great business asset, "and I'll teach him more in one day down in somebody's boiler plant than he could learn in a week anywhere else. He's got his mind in it. It's business for him. And there's a practical application for every theory. He's psychologically ready for his lesson there. He gets 90 per cent of it and fixes it in his mind.

"I think it would be a good idea for every company with a fuel engineer to have that man make regular tours of the field—two or three days or possibly a week or two with each salesman, depending upon conditions in the territory. If the salesmen know he's coming and about when to expect him, they will take more interest in every little problem and every little complaint of their customers. They will make up lists of places to call with him and things to be done. The result will be better satisfaction from that company's trade and salesmen much better trained."

A salesman with only a rudimentary knowledge of boiler-room practice would be able to solve many of the problems that perplex small plants manned only by a more or less unskilled fireman such as was on the job a year or so ago for a small Dakota biscuit company that was using coal shipped by an Illinois mining company. One day a salesman wrote in to the home office saying that the president and general manager of the biscuit factory had decided to change to another kind of coal because he had discovered his fuel costs, in proportion to steam output, were almost twice those of anybody else in his industry. The salesman had talked loudly and long, using his most persuasive methods, but all to no avail. He asked for the service engineer.

Dampers Wide Open and Fires Almost Out

"The plant turned out to be one of the dirtiest little dumps I ever saw," related the fuel engineer. "Originally it had but one boiler, but the president told me he had installed another because the 'engineer' insisted he could save coal that way. You see, the occasional peakload was too great for one boiler. Ordinarily, in warm weather, the plant needed steam only to heat water and once in a while to run the ovens when there was no need to heat the building. It was summer when I was there.

"Well sir, I found the little Italian who was trying to run the boiler room so as to 'save coal' had the dampers wide open—they looked as if they never had been closed—and the ashpit doors clear off!

"'What have you got the doors off and the dampers open for?' I asked him.

"'Got to,' he said. 'Alla ready to get up steam queeck'!

"About that time somebody from up in the bakeshop hollered down for steam for the ovens. Well, you ought to have seen that little fellow raise steam. With his drafts all open and no demand for steam, his fire had practically gone out. He grabbed up a lot of kindling and threw it in both fireboxes. Before I knew it, he had those boilers popping off, and less than half of a good fire under either of them! Then, almost as quickly, the fires cooled down again on account of the great quantities of excess air going through the furnaces.

"His system was to try and keep two thin firebeds hot all the time, even though most of his fuel went up the stack. Then, whenever steam was needed, in went the wood and up went the pressure. Great scheme—nit.

"Well, all they needed in that plant was to put in a good, conscientious fireman who knew what to do and was willing to work. Then, in summer they could cut out one of the boilers and by decent, intelligent firing, raise enough steam to take care of the peaks. In winter they could work both boilers, keeping one fire bright and the other checked except at rush hours. To make a long story short, that's what they did, and as far as I know they're getting along all right. I know they're still buying our coal regularly and without a kick."

These service engineers meet all sorts of problems, going and coming among scores of plants, facing tasks both simple and complex. In one case an engineer went into a plant to find out what ailed the draft through a new horizontal water-tube boiler that was not performing as well as the others. The plant engineer insisted its design was exactly the same as that of the boilers previously installed, and to all outward appearances he was right. Finally the fuel engineer asked to have the fire drawn and the boiler cooled off so that he could make a more thorough examination. He found the opening from the combustion chamber to the bank of tubes was only 36 in. and the aperture from the tubes to the space below the steam drum was but 18 in. wide. He recommended 60- and 40-in. openings. Sections of the lower and upper baffles were accordingly knocked out and the fire was rebuilt. From that day on the boiler performed excellently.

"My job is made up of a lot of things, but 80 per cent of them have to do with correcting faulty draft," declares one of the combustion experts who works out of Chicago. "Seems as if there are lots of power-plant engineers who do foolish things to the currents of air that are the breath of life to their whole plants. I remember one case where I found an engineer completely fuddled because his two boilers wouldn't work worth a cent after two rusty old steel stacks had been taken down and a slick new brick stack erected to replace them. The old stacks had led directly off the tops of the boilers. The new brick chimney had to be built off about 20 ft. to one side, where there was room for it, while a horizontal S-shaped steel breeching connected the boilers to the stack.

"Because that brick stack had exactly the same area of cross-section as the combined area of the old steel stacks and the same height—70 ft., I think it was—the engineer figured it would give exactly the same draft. He forgot that the gases had to be pulled through that 20 ft. of horizontal breeching with its three turns, and that to do this work required considerable power in the form of draft intensity. After the new stack was in use, the draft at the flue-cap doors of the horizontal fire-tube boilers was reduced from approximately 0.45 in. with the old stacks to about 0.3 in. with the new one. Of course all that was necessary was to add enough more height to the new stack to exert the extra 'suction' that was required to pull those gases through that crooked breeching. A foot of stack height increases the draft about 0.0063 in. So, knowing from the gage just how much the new draft fell short of the old, he added enough lightweight tile top to the stack to give just the draft required."

It may be added that the engineer who figured out the problem of that stack did not sell any coal and that he cost his employing company more than he returned in results. There is no definite explanation for this condition. It is typical of much of the service of fuel engineers employed by coal companies. If their employers do not profit by the good will they create, then their salaries and expenses are wasted. But wise men in the coal industry firmly believe that the competent fuel engineer is indispensable. They believe the fuel engineer is beginning to put into coal salesmanship an element of the technical that it has long needed and which, in the strenuous days to come, will prove of great value.

Field studies have been made in Pennsylvania by the U. S. Bureau of Mines regarding the preparation and particularly the washing of both anthracite and bituminous coal. In addition special attention was given to two new coal-cleaning processes now being tried out on anthracite—the Conklin-Elmore and the Chance processes. Methods for the utilization of culm were examined. In the bituminous fields the use of tables and dewatering pits were studied.

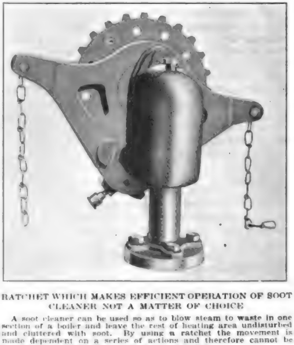
Ratchet So Regulates Soot Cleaner That Steam Cleans all Surfaces Equally

SOOT-CLEANER owners sometimes have complained that these devices did not thoroughly remove all the accumulations of soot from their boiler tubes. Investigation disclosed that in a majority of such cases the cleaning elements either were being rotated too fast or being operated by careless workmen through only a fraction of their full permissible sweep. In consequence the cleaner was prevented from doing its work properly, the steam jets not being allowed sufficient time for complete removal of the soot from the tube surfaces.

To correct this difficulty, as well as to make the soot-cleaning operation more mechanical and less dependent upon the uncertain human factor, a new ratchet cleaner head has been designed and is now being placed upon the market by the Vulcan Soot Cleaner Co., of Du Bois, Pa.

The new head is so constructed that when the operator pulls the chain the cleaning element is rotated through only a small arc. It can be turned no farther until the ratchet frame has been returned to its original position, after which a pull on the chain causes the element to rotate another space. Between movements of the new head, the steam jets have an opportunity to concentrate their action upon a definite section of the tube surface for a length of time sufficient to insure a thorough removal of the soot. When the complete arc of effective operation has been swept through in one direction, this being limited by "stops" especially set for that purpose, the mechanism automatically reverses itself and the cleaning element moves backward in the same manner through the same arc. Any soot that may have redeposited after the first movement of the element is completely removed on the reverse travel.

In designing this head the fundamental purpose of every soot-cleaning apparatus—namely, the thorough



RATCHET WHICH MAKES EFFICIENT OPERATION OF SOOT CLEANER NOT A MATTER OF CHOICE

A soot cleaner can be used so as to blow steam to waste in one section of a boiler and leave the rest of heating area undisturbed and cluttered with soot. By using a ratchet the movement is made dependent on a series of actions and therefore cannot be done so as to direct all the steam to one point.

removal of soot—was kept constantly in view. The device was thus built with this purpose only in mind, placing no dependence on the competency of the individual actually manipulating it. The net result is a mechanism that takes the control of cleaning entirely out of the hands of the operator and places it solely in a ratchet-operating head.

This head possesses five characteristics of high importance to the power plant owner. These are: (1) It prevents the man operating it from neglecting any portion of the complete sweep of the cleaning element; (2) it substitutes a step-by-step rotation for the old irregular, uncertain movement governed by the whim of the operator and his desire to get through with the job as quickly as possible; (3) it assures a saving in the quantity of steam used, because the operator knows that he has to make the sweep only once in each direction and can stop when this has been completed; (4) it provides the operator with a clearly defined task, instead of a vague and indefinite one, and (5) it entirely eliminates wrong methods of soot cleaning.

As may be seen in the accompanying illustration, the new head is simple and strong while its action is positive and sure. It is operated independently of the steam valve, and consequently should the operating mechanism accidently fail for any cause the whole cleaner system is not put out of commission while repairs are being made. The value of a soot cleaner depends upon its usefulness. If the temporary failure of one element means that the whole system is out of use until that one part has been repaired, the real utility of the cleaner is seriously impaired.

San Francisco Labor Plan Guards Interests Of Public, Labor and Employer

WHAT is termed a new plan for handling labor has been introduced by the Industrial Association of San Francisco. Here is how the association explains it:

"The general public may be interested in learning that the American plan as established and enforced in San Francisco by the Industrial Association is something distinct and different from the old-time, so-called open shop. Whereas the open shop wherever enforced usually has meant the entire absence of all restriction or restraint upon employers with respect to wages paid, hours of work and other conditions of employment, thereby giving opportunity for unscrupulous employers to deal unfairly, the American plan in San Francisco has set up machinery for reasonable control of these matters in the interest of the public.

"In other words, it really has been a *plan*, definitely conceived and definitely carried out, in the interest not of any special group or faction but in the interest of the three parties to industrial relations: the public, labor and the employers.

"The American plan is predicated upon the proposition that the public interest is paramount to that of any other community element, and that neither labor nor capital, nor any other faction or class, should be allowed to take action that will jeopardize that interest. And, as the public interest actually would be jeopardized as much by unfairness of any kind visited by the employers upon labor or consumers as by autocratic labor-union control of industry, the American plan prevents either of these things taking place.

"The American plan says to labor: 'You cannot be allowed to obtain an autocratic, selfish and restrictive control over industry, for the result is that not only the industry itself but the whole public is seriously injured thereby.' It says to the employer: 'You cannot be permitted to beat down labor, for when labor receives less than that to which it is justly entitled, not only labor but the whole public suffers seriously and is permanently injured, and we will not give you such unlimited backing that you can enter into combinations with your competitors and get a monopolistic control in your industry under cover of a community-wide organization.'

"Then, turning again to labor, it says: 'You are entitled to an equitable wage, to reasonable hours and to decent working conditions, but in turn you must be willing to give to your employers honest, loyal and efficient service.' And turning once more to the employer, it says: 'You have the right to demand honest, loyal and efficient service from *all* your employees. You are entitled to the right of hiring and discharging employees individually on merit, without outside interference, so long as on all occasions that right is exercised only upon broad principles of justice; and to the right of rewarding individual merit in employees, but in turn you must recognize the obligation of the management to the employees generally, and particularly to co-operate in providing, so far as possible, continuous employment.'

"Roughly, and in brief, that is the American plan as established and enforced in the building industry of San Francisco by the Industrial Association. Theoretically fair, it stands proven as practically fair as well. It has freed labor from the self-imposed but misconceived restraint of selfish leadership, has emancipated employers from the throttling control of labor unions, and has guaranteed to the public, to labor and to the employer that all their legitimate rights will be protected at all times."

Would It Be Profitable to Make Fuel Smokeless for Salt Lake City?

IN a survey of the Salt Lake City smoke problems, engineers of the U. S. Bureau of Mines found that about 27 per cent of the smoke made in the city was from residences. As the most obvious way of eliminating the domestic smoke nuisance is to provide smokeless fuel for these consumers, the bureau conducted an investigation regarding the feasibility of establishing a local supply of coke to take care of domestic heating requirements. The bureau found that the installation of a byproduct plant of sufficient size to supply the entire domestic demand of Salt Lake City for coke fuel is not economically feasible unless municipal legislation prohibiting the production of smoke is obtained. By education and legislation consumers must be induced to pay $3 more per ton for smokeless fuel than for the ordinary bituminous coal in order to make the carbonization plant a success. Although the coke and byproducts of a low-temperature carbonization plant probably would find a readier market than those of a standard high-temperature plant, neither plant would be a commercial success without protective legislation.

A semi-experimental 100-ton plant should be able to operate with a smaller differential between the price of coal and coke due to more favorable disposal of the smaller volume of byproducts. Future developments in the iron industry of the state and in the substitution of byproduct ovens for the beehive ovens at Sunnyside, Utah, when conditions warrant the change, will make available a supply of the smaller sizes of coke for domestic use, but it is doubtful whether the entire domestic demand can be supplied in this manner at a sufficiently low price. No single solution for the domestic smoke nuisance appears available. Means which should be considered for alleviating the nuisance are (1) sale of the available supply of gas-house coke; (2) briquetting of coke breeze from the beehive ovens at Sunnyside for domestic fuel; (3) burning of powdered coal where feasible; (4) installation of semi-experimental 100-ton plant for low-temperature carbonization; (5) continuation of educational campaign to teach domestic consumers proper methods of firing the native coal.

Problems of Operating Men

Edited by James T. Beard

Successful Use of Flexoid Tubing in Sinking Mine Shaft and Slope

Use of Exhaust from Compressed-Air Machines for Ventilating Blind Headings Causes Trouble—Flexoid Tubing Saves Expense, Gives Good Air and Avoids Disaster

IN REGARD to the ventilating of a blind entry, by means of the compressed air used for driving the drills and coal cutters, allow me to say I have had considerable experience of the kind, having often ventilated tight places by allowing air to escape from the pipe line, at times when the machine was idle. At other times, the exhaust from the cylinders was sufficient to furnish good ventilation.

While the results were generally good and, I believe, breathing the air produced no ill effects on the men, there were those who would complain that they suffered from severe pains in the head, shortness of breath and a general all-gone feeling, which they attributed to breathing the air exhausted from the engine. Personally, I ascribed these effects to too much "moonshine" the night before.

No argument could convince these men on that point, however; and it cannot be denied that there is a deep-seated prejudice, in the minds of many, against the use of compressed air for ventilation. Knowing this, I decided to adopt some other method of ventilation when taking charge of another job.

This undertaking was to sink a 145-ft. shaft, together with a 500-ft. slope, at given points on the surface, and connect the two openings underground by driving entries in the seam. The distance between the bottom of the shaft and that of the slope was 600 feet.

Investigation showed that several firms were making small fans or blowers similar to what a blacksmith uses at his forge only larger. I secured two of these blowers and a considerable length of flexoid tubing made by the Bemis Bro. Bag Co. of St. Louis.

One of the blowers I installed at the top of the shaft and the other at the mouth of the slope. A length of the flexoid tubing was attached to each blower and extended down the shaft and the slope, respectively, to conduct the air furnished by the blowers to the working faces.

The result was more than satisfactory and the entire cost of installing the two fans with sufficient tubing to finish the job and including what repairs were made from time to time was less than $1,000. This cost was repaid many times by the comfort and peace of mind of the men possessed of the compressed-air bugaboo.

There is one serious objection to the use of compressed air for ventilation, as was shown by what happened in an instance in my own experience. A blast had been fired at the face of a heading and the entryman, wishing to clear the smoke away quickly, opened the valve wide on a 2-in. air pipe that was under a pressure of 100 lb. gage.

There being no cutoff on the compressor, which was laboring heavily under the load, the engine at once started to race when the valve was opened. As a result the governor belt broke, and, in few moments, the engine and the compressor were strewn about the floor of the engine room.

A great strain is thrown on the compressor and the engine or motor driving it when operating under a heavy load. A sudden release of pressure is dangerous unless the compressor is equipped with the recent unloading devices. This severe strain, however, is a factor that must always be considered.

In conclusion, let me say that the flexoid tubing I mentioned must be put up in accordance with the instructions sent by the factory. Also, it must be kept in good condition, free from holes and not allowed to sag, if good results are to be obtained.

In my opinion, a good supply of fresh air can be had in this manner, with a less cost than by any other means on the market today. A similar tubing, I learn now, has been devised and is manufactured and sold under the name "Ventube," by the Du Pont Powder Co., Wilmington, Del.

Carrolltown, Pa. CONTRACTOR.

Sealing Off Abandoned Areas Safest Practice

Large caved areas impossible to ventilate—Panel system of working presents a new difficulty—Possibility of fire less when abandoned areas are sealed.

THE discussion regarding the sealing off of abandoned areas in mines has interested me greatly. I was particularly glad to see the letter of Albert Rickets, *Coal Age*, Mar. 23, p. 493, who argued in favor of the practice of sealing off such areas.

Previous writers had contended that it was dangerous to seal off these areas, owing to the likelihood of their becoming filled with explosive gas. The suggestion of ventilating these places will, at first sight, appeal to many as the right thing to do. It is my belief, however, that experience and further thought will convince most of these advocates that they are wrong.

While it is a simple matter to direct an air current into an abandoned area, it becomes a practical impossibility to conduct that current in such a manner as to make it sweep the entire area or even to dilute the accumulated gases to an extent to render them harmless.

CAVED AREAS PRESENT DIFFICULTIES IN KEEPING THEM CLEAR OF GAS

All will agree that caved ground generally prevents the erection of brattices and other means of conducting the air through such places. An air current directed into caved workings will, naturally, take the shortest way out and, if tested at the point where it leaves the old works, will seldon be found to contain more than a small percentage of marsh gas.

Such a test, however, cannot be taken as any indication of the true condition of the atmosphere existing in the heart of the old workings. Mine officials who have had occasion to examine large abandoned areas, will recall many instances where it was impossible to explore such places any distance to the right or left of the path taken by the air current, owing to the presence of a dangerous percentage of gas.

Within the past few years, much mining has been done by the panel system, where each panel is an area by itself separated from other panels by barrier pillars. There is no fixed size for these panels, which may cover an area of ten acres, more or less.

ABANDONED PANELS HARD TO VENTILATE

It is evident that the ventilation of such areas when abandoned is quite a different proposition from keeping the old workings free from gas, in the room-and-pillar system of mining. In a large panel area, an air split of five or ten thousand cubic feet is practically lost, the air having a velocity that is almost negligible in such an area.

There is still another danger in attempting to ventilate large abandoned areas. This is owing to the disposition of such areas to spontaneous combustion. For this reason alone, if for no other, my belief is that the only safe method of dealing with an abandoned section in a mine is to seal it off as tightly as possible by means of well built stoppings.

It is generally understood that fires cannot occur or gas be ignited where the supply of oxygen is insufficient for combustion. From the time an area is sealed, there is a continual though gradual decrease in the oxygen content of the air, owing to the absorption of the oxygen by the coal and through different forms of oxidation taking place.

It is worthy of note that, in any abandoned area, there may be sufficient air to support combustion and yet the ventilation be wholly inadequate to exercise any cooling effect in the mine, which is an important factor in keeping the old workings safe.

Sealings Built in Advance

My observation is that the conditions inviting gob fires in mines are so well known and recognized that many operators start the building of substantial seals some little time before an area is to be abandoned. These seals are carried well up towards the roof, in many of the openings and require but a short time to close them completely when that moment arrives. With proper care, sufficient air can be kept in circulation where the men are at work, while the condition in other parts of the area are such as to lessen the tendency of the waste to fire. To my mind, this is an important subject.

James Dickson.
Victoria, B. C., Canada.

Another Letter

In his letter, *Coal Age*, March 30, p. 536, I. C. Parfitt gives a number of good reasons why the building of seals is not an effective method of dealing with waste or abandoned places in mines. Both the writer of that letter and of the following one argue in favor of ventilating such places instead of sealing them off.

While I am not in favor of the erection of seals in all mines, there are conditions in the Bicknell field where I am now employed that render it impossible to work the mine without sealing off abandoned areas.

The first writer to whom I have referred says that the practice of building seals is to "establish intimate relations with a known and active enemy." For my part, I would rather do that than to take chances with an unknown enemy, as would be the case in attempting to work No. 5 coal at Indian Creek, Bruceville and American No. 1 mine, without seals.

In this field, what is called the "steel band" is a hard rock that lies some 5 ft. above the coal. The top of this seam caves badly and makes much gas, which accumulates on the falls, often coming down to the top of the coal and requiring a strong air current to dilute and carry it away as fast as it accumulates.

To attempt to ventilate, say ten or fifteen worked-out places, under these conditions, would require from 75,000 to 100,000 cu.ft. of air in circulation. Moreover, there would be every likelihood of the steel band falling and striking sparks that would ignite the gas on the falls.

Under conditions where a feeble air current is sufficient to ventilate an abandoned area, it may be possible to keep such places safe and free from any dangerous accumulations of gas. That is not possible, however, under the conditions I have mentioned.

In working coal 6 ft. high, under 250 to 300 ft. of cover, safety requires barrier pillars 75 ft. thick; and where large quantities of gas are generated, pipes should be built in the seals to enable samples of the gas to be taken, from time to time.

My experience is that what change of pressure takes place in such sealed areas is very gradual, and due wholly to changes in atmospheric pressure. When the seals are first built, there is the same pressure on both sides of the seal. As the barometer falls, the air within the sealed area expands and blows out through the pipes. Again, as the barometer rises, the mine air is forced into the inclosure. In other words, the pipes left in the seals blow out and blow in with every fall and rise of the barometer.

A drillhole sunk from the surface has such a small area, compared with the volume of air inclosed behind the seals, that such holes have little effect to quickly equalize the pressure due to a change of barometer. At the American No. 1 mine, we never had a pressure behind the seals greater than 3½ in. of water gage or, say 18 lb. per sq.ft., blowing out and almost that when blowing in.

Our experience is that when seals are properly built in good solid coal pillars there is far less danger than when these abandoned areas are left standing open.

Alban Ricketts,
Wheatland, Ind. Standard Coal Co.

Success of Any Plan Depends On How Carried Out

In REGARD to the sealing off of abandoned workings, I have been surprised at the difference of opinions expressed in the several letters that have appeared in *Coal Age*. This is an important question in coal mining and one that has been given much thought and study.

To my mind, there are arguments in favor of both of these practices; and it is necessary to make a careful study of the conditions, before deciding which method would be the safest to adopt. Whatever plan is employed, its success will depend on the manner in which the work is carried out.

I know a mine where they seal off all abandoned workings and have no trouble. Again, I know of other mines, within a radius of ten miles, where the abandoned workings are left open and no trouble is experinced by reason of so doing. There are many things to be considered in deciding a question of this kind, and it is impossible to lay down any fast rule, without being on the ground and knowing the conditions.

The questions of whether the mine generates gas; is making much water in the workings; whether the pillars are drawn or left standing; and whether the mine is ventilated on the blowing or exhaust system, must all be taken into consideration, together with other things that are made known only by a careful study of the situation. In general, my belief is that no serious danger need be expected when a proper plan has been adopted and is carried out in good faith, from the start.

Just now, I have in mind a large mine that was opened in a very gassy coal. The mine was planned by an engineer who made a careful study of the conditions that must be met underground. The main headings were driven five abreast and butt headings turned off these to the right and left, in pairs, at distances of 500 ft. apart. The three middle main headings formed the intake and the two side headings the return airways for each respective side of the mine. The three intake airways were each 6 x 10 ft., in section, giving a total intake area of 180 sq.ft. The two side headings were driven 15 ft. wide, in order to provide an equal return area.

Twenty rooms were driven to the right and left of each pair of butt entries, making forty rooms in a section ventilated by a single air split. Concrete stoppings were used in all crosscuts and the air bridges or overcasts were reinforced with steel rails. Double trapdoors were used between the two headings of a pair, to avoid any interruption of the air current.

No pillars were drawn in this mine, as the surface conditions would not permit. Accordingly, each section was thoroughly ventilated until all the rooms on that section had been worked out, when the entire section was closed off at one time. As quickly as one section was worked out, another section would be in readiness for development.

In this mine, the company experimented, for a short time, with sealing off the butt entries by building 2½-ft. concrete walls having a 4-in. pipe near the bottom and a 6-in. pipe at the top, built into each wall. These pipes were provided with valves and were for the purpose of draining off any water that might accumulate and for testing the gas behind the seals. With such a system as this, no danger should be expected if the plan is carefully worked out and followed.

Ostel Bullock.
Central City, Ky.

Ideal in Superintendency

No one man can fit all positions—The ideal superintendent must have wide knowledge and experience in all branches of mining—One chief qualification ability to keep down costs.

THE discussion, in *Coal Age*, of what constitutes the make-up of a mine superintendent has been both amusing and instructive. I have wondered why we have not heard from more superintendents themselves, or better yet why some general manager has not given us his test of qualifications for the position.

The general manager knows the type of men he must have as superintendent. In making his selection, he invariably studies carefully the fitness of the man he may appoint to fill the place. In this respect, a superintendent must pass the same scrutinizing test as a mule driver, timberman, trackman, electrician or other worker, only more severe.

No one man can be equally fitted for all the various branches of coal-mining work. There are superintendents that fill the position with credit to themselves and the companies who employ them; but, placed in another position, they would fail badly, because they are not adapted to the work in hand.

WHAT HE WAS GOOD FOR

I once knew an old farmer who had a dog that he had never been able to find what the animal was good for. One day a man came along and inquired of the farmer if he knew where he could get a good coon dog. "Well," said the farmer, "you can have this dog for $25 and if he will not hunt coons bring him back and get your money."

About a year later, the farmer again met the hunter who, to his surprise, told him the dog was the best coon dog he had ever known. The farmer stroked his whiskers meditatively, and remarked, "I thought so, as he was no good for anything else."

Questions have been asked: Should a superintendent be a college graduate; a certified mine official; a good organizer; loyal to the company who employs him? To all of these questions, I answer "Yes, and have a hundred other qualifications besides." I have never known a mine superintendent to have too much knowledge and experience.

By way of illustration, let me assume that a coal company has a position open for a superintendent. He must be a man capable of assuming complete control of a mining camp that is isolated from the rest of the world. It is a new operation of fairly large size and the man chosen to superintend the work will be required to open the mine, build and equip the plant, and build the town, in a manner to secure the best returns on the money invested.

REVEALING FITNESS OF APPLICANT

We will assume that the position is advertised in *Coal Age*, where it is stated that the applicant must explain fully, in his first letter, his knowledge and previous experience in coal mining, and outline briefly his plan of proceeding in the undertaking at hand. This forecast of the situation would reveal plainly whether the applicant was a student direct from college, or whether he has the necessary knowledge and experience in coal mining that fit him for the place.

While it is true that the superintendent can employ an engineer, architect, mine foreman, electrician and other men fitted for their special work, he must himself have the knowledge and experience to know whether or not they are efficient in their several departments. The superintendent cannot afford to take long chances on the fitness of the men he employs. The position requires a well trained mining man.

We have all seen operations where the plan of the undertaking could not be improved in any respect; and, on the other hand, we know of places where the plan is wholly impracticable. We have seen mining camps where little consideration has been given to the kind of houses suited to miners, or to the question of water supply, sewerage and other living necessities.

Briefly stated, the responsibilities that rest on the shoulders of a mine superintendent are manifold. Chief among them, however, is the necessity of keeping down costs. Here is where the superintendent must prove his real qualification. He must be able to show a satisfactory difference between the cost of production and the selling price of the coal.

How often the question is asked, "What does your coal cost on the track ready for shipment?" The intelligent superintendent has this question ever in mind. Its answer is the test of his ability and fitness for the position he holds.

Speaking of college training, mention should be here made of the excellent work of Dr. E. S. Moore, dean of the School of Mines, State College, Pa., who has organized mining-extension classes throughout the coal-mining districts of the state. The result is that men and boys are being taught the essential principles of successful mining that will enable them to become practical men able to assume positions of responsibility in every branch of mining. S. D. HAINLEY.

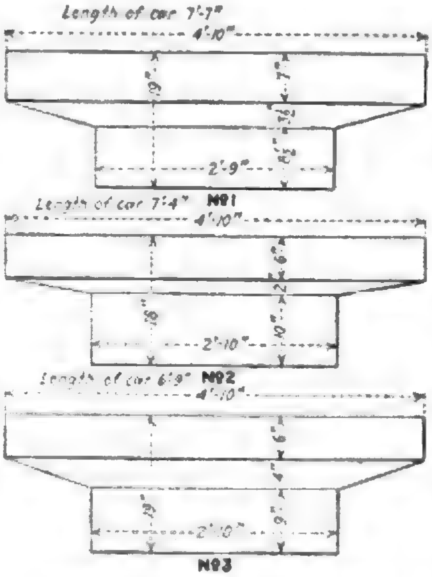
Osceola Mills, Pa.

Inquiries Of General Interest

Calculating the Capacity of Mine Cars

Miners' Dispute the Rated Capacity of Mine Cars—Calculation of Cubic Contents Forms Basis of Tonnage Capacity —Average Mine-Run Coal, Forty Cubic Feet per Ton

SOME dissatisfaction arose recently, among a few of our miners, regarding the rated capacity of the mine wagons in use. It was finally decided to submit the matter to *Coal Age*, those who were dissatisfied with the present rating agreeing to accept the decision in regard to tonnage and number of bushels the cars will hold.



THREE TYPES OF MINE CARS

In keeping with this agreement, I am inclosing a sketch showing the dimensions of three cars, which are types of those in use in the mine, and have numbered these 1, 2, and 3. The cars are to be loaded even with the top and the coal is an average bituminous coal. All dimensions shown on the sketch are inside measurements. They are as follows:

No. 1 Car: Length 7 ft. 6 in.; top width, 4 ft. 10 in.; bottom width, 2 ft. 9 in.; depth, 1 ft. 7 in.

No. 2 Car: Length, 7 ft. 4 in.; top width, 4 ft. 10 in.; bottom width, 2 ft. 10 in.; depth, 1 ft. 6 in.

No. 3 Car: Length, 6 ft. 9 in.; top width, 4 ft. 10 in.; bottom width, 2 ft. 10 in.; depth, 1 ft. 7 in.

These dimensions, together with the depth of each section, are marked on the sketch, for each car. J. R.

———, Pa.

In estimating the tonnage capacity of the cars shown in the accompanying figure, which is a duplicate of the sketch sent us by this correspondent, we first calculate the cubic contents of each car and then compute the tonnage of the car, allowing 40 cu.ft. of mine-run coal, per ton, which is the customary allowance for bituminous coal of average quality. This allowance will, of course, vary slightly with the specific gravity of the coal, which may range from 1.2 to 1.5. The weight of the coal per cubic foot will also vary according to its condition, whether dry or wet. For the purpose of estimate, however, it is customary to allow 40 cu.ft., per short ton of mine-run bituminous coal; or 40 cu.ft., per long ton of the same grade of anthracite.

CROSS-SECTIONAL AREA OF EACH PART COMPUTED SEPARATELY

It will be observed that the cross-section of each car is divided into three parts, top, middle and bottom sections. Reducing all dimensions to inches, the area of each section is found in square inches and their sum, divided by 144, gives the sectional area of the car in square feet. This multiplied by the length of the car, in feet, gives the cubic contents, in cubic feet, which divided by 40 gives the desired tonnage. The calculatons are as follows:

Car No. 1:

Section		
Top	7 × 58	= 406
Middle	3½ × 45½	= 159.25
Bottom	8½ × 33	= 280.5
	19 in.	845.75 ÷ 144 = 5.87 sq.ft.

(5.87 × 7½) ÷ 40 = 1.1 tons; or 27½ bus.

Car No. 2:

Section		
Top	6 × 58	= 348
Middle	2 × 46	= 92
Bottom	10 × 34	= 340
	18 in.	780 ÷ 144 = 5.42 sq.ft.

(5.42 × 7⅓) ÷ 40 = 0.994 tons; or 24.8 bus.

Car No. 3:

Section		
Top	6 × 58	= 348
Middle	4 × 46	= 184
Bottom	9 × 34	= 306
	19 in.	838 ÷ 144 = 5.82 sq.ft.

(5.82 × 6¾) ÷ 40 = 0.982 tons; or 24.55 bus.

Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

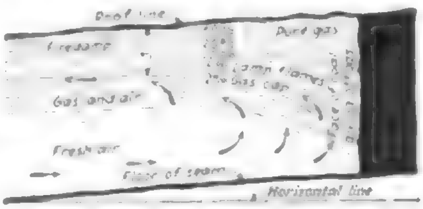
QUESTION—*Assuming that a pair of headings, each 5 ft. high and 8 ft. wide, are being driven to the rise, on a grade of 10 per cent, suppose one of these headings is standing idle, waiting for a crosscut that is almost through, and the fireboss reports that the idle heading is filled with gas to within 1 ft. of the bottom, at the face. (a) State what quantity of gas is in the heading. (b) As mine foreman, how would you proceed to remove the gas with safety? (c) State what quantity of gas would be in the headings if the pitch was 10 deg. instead of 10 per cent.*

ANSWER—The height from the floor to the roof of this heading being 5 ft., and the rise 1 ft. in every 10 ft. of horizontal distance, a level line drawn from a point 1 ft. above the floor, at the face, would strike the roof at a distance of 40 ft. back from the face.

It is hard to understand how a fireboss could crawl under this body of gas and make an accurate measurement at the face, a foot above the floor. In so doing, he would disturb the gas and it would be difficult for him to retreat in safety.

(a) Theoretically, the body of gas accumulated in this heading and extending from the face to a point 40 ft. back, in the entry, has a volume of $\frac{1}{2}(4 \times 40)8 = 640$ cu.ft. It cannot be assumed, however, that this is pure gas. As shown in the accompanying figure, the diffusion of the gas given off at the face forms successive layers of gas-charged air, the percentage of gas increasing toward the roof. It is probable that, under the conditions stated, this heading would be filled with a firedamp mixture from 2 to 3 ft. below the roof and extending almost to the last open crosscut, where it would be diluted by the air current passing through that opening.

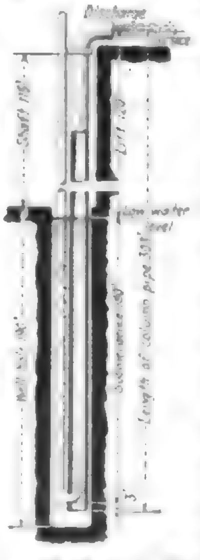
(b) This is a dangerous body of gas and, before making any attempt to remove it, the foreman should withdraw all the men working in that pair of headings. He should further safeguard all entrances to the main return of that current, so as to prevent anyone from entering the return. Having chosen competent men to assist him, the foreman should proceed to extend a line of brattice, from the outby rib of the open crosscut a short distance into the heading containing the gas. If this is the return heading, the line of brattice should be carried up the heading, about 2 ft. from the rib of the entry pillar. If this heading is the intake, the line of brattice should be carried along about 2 ft. from the opposite rib. It should be extended toward the face gradually, giving time for the air current to act on the gas. Always, careful tests must be made to determine the progress of the work before extending the brattice another length toward the face.



(c) A pitch of 10 deg. instead of 10 per cent, corresponds to a rise of 17.63 ft. per hundred, which would be a 17.63 per cent grade. In that case, the theoretical distance the gas would taper off at the roof, for a depth of 4 ft. at the face, would be 4 ÷ 0.1763 = 22.7 ft., making the theoretical volume $\frac{1}{2}(4 \times 22.7)8 = 363$ cu.ft. Practically, as before stated, a dangerous percentage of gas would extend back in this heading to a point almost to the last open crosscut.

QUESTION—*For the purpose of handling the water accumulating in a shaft 115 ft. in depth, it is proposed to install an air lift capable of handling, say 70 gal. of water per minute, under a discharge head of 120 ft. To what depth will it be necessary to drill a wellhole, in order to give the required submergence of the column pipe necessary to insure successful working? Also, what air pressure will be required and what volume of free air must be provided when estimating on a discharge of 100 gal. per minute?*

ANSWER—The safest practice in air-lift pumping is to provide a submergence of the column pipe not less than 50 per cent greater than the actual lift, as measured from the low water level in the sump or wellhole to the point of discharge at the surface. In other words, the depth of the submergence should be 60 per cent and the actual lift 40 per cent of the total vertical height of the column pipe. As shown in the accompanying figure, the actual lift being 120 ft., the depth of submergence of the column pipe is half again this depth or 180 ft.



It is well to estimate on a column pipe of sufficient size to carry the required quantity of water with a velocity not to exceed 100 ft. per min. For a discharge of 100 gal. per min., on this basis, a 5-in. pipe will be required.

The air pressure must be sufficient to overcome a head of water equal to the depth of submergence, which in this case is 0.434 × 180 = 78.12, say 80 lb. per sq.in., corresponding to an absolute pressure, at sea level, say 95 lb. per sq.in. The estimated volume of free air required to lift 100 gal. of water per minute, through a height of 120 ft. is (100 × 120) ÷ 125 = 96 cu.ft. per min.

As shown in the figure, the air pipe (in this case 1¼ in. diameter) is carried under the mouth of the column pipe and bent upward and extends, say about 3 ft. within the column pipe, so as to insure that none of the air will escape downward, instead of bubbling upward and raising the water in the column pipe. It is the bubbling air within the pipe that decreases the relative density of the water column in the pipe, which is thereby forced up to the point of discharge at the surface, owing to the greater pressure of the water column in the wellhole.

German Coal Output Shows Marked Increase; Renewal of Equipment Pressing Need

By H. O. Herzog
Berlin, Germany

A MARKED increase in coal output took place in March in most of the mining districts of Germany. The total production of that month was 13,418,000 tons, which is about 2,000,000 tons more than in March, 1921, and only 500,000 tons less than in 1913, the record year in German coal production. The figures for March do not include production by the Saar district and Alsace-Lorraine. March output was as follows, in metric tons:

Bituminous coal	13,418,000
Lignite	12,260,000
Coke	2,513,000
Bituminous-coal briquets	491,000
Lignite briquets	2,634,764

Production for the first quarter of 1922, in comparison with the corresponding periods in 1921 and 1913 is shown in the following:

First quarter	Bituminous coal	Lignite	Coke
1922	37,040,000	33,380,000	7,183,000
1921	35,479,000	30,072,000	7,116,000
1913	43,160,000	20,018,000	7,560,000

The returns for this year compare favorably with those of last year, but it should be taken into account that the extra shifts which were in force until March, 1921, aided materially in increasing the production of that period. The main mining districts share in the production as follows, in metric tons:

Ruhr	9,014,000
Upper Silesia	3,212,000
Lower Silesia	490,000
Saxony	402,000
Aix la Chapelle	231,000

The output of Ruhr coal during March exceeded that of February by 1,217,000 tons, but it should be remembered that March, 1922, contained three more working days than the preceding month. It is important, however, to note that production per day since February has increased by 11,000 tons. A slight increase also can be noted in the daily output of coke and briquets. Marked improvement in transportation has taken place. Complaints in this direction had completely ceased by the end of March. The improvement culminated in April in the unusual situation of more cars being available than were required. The accumulation of coal and coke reserves at the mines, however, had not materially decreased by the end of March. The quantity of fuel stored was still 1,475,000 tons, which is quite abnormal in comparison with last year.

The output in Upper Silesia was 500,000 tons, or nearly 20 per cent higher than in February, which, as in the case of the Ruhr district, is partly due to an increase of the daily output. The output of byproducts kept in proportion to the production of coal. Shipments, however, still suffered somewhat from inefficient transportation.

The production of lignite, which has almost doubled since 1913 and now closely approaches the output of bituminous coal, continues to increase. In the central German mining districts the increase since February is 7.6 per cent and for briquets 12.8 per cent. The increase is even more noticeable in the case of lignite coke, which, owing to the scarcity of high-grade coke, finds a ready market. A striking increase is seen in the lignite production in the Rhineland, which in March was 19.4 per cent higher than in March, 1921, and 118 per cent more than in 1913.

Without arousing special notice by the public, the price of German coal has lined up with the so-called world market standard. For years this has been the chief topic of discussion on the coal situation. The newest increase has brought prices to the following figures, in marks per metric ton:

Pit coal, unwashed and unassorted	907.50
Best steam nuts	1,194.30
Coke	1,308.10

These prices are at mine in Rhineland Westphalia. In various parts of the country, of course, the prices are higher, depending upon the distance from the mines. In Berlin, for instance, the wholesale prices are:

Pit coal, unwashed and unassorted	1,308.15 M per metric ton
Best steam nuts	1,600.86 M per metric ton
Coke	1,716.00 M per metric ton

At the present rate of exchange the gold parity of these prices is 19.07M, 24M and 26M respectively. Corresponding pre-war prices in 1913 were 20.75M, 24M and 26M.

Berlin prices approximate those of Hamburg and other places along the sea coast. This is more than English coal now costs in Hamburg. Apart from the fact that the grades used for shipping cannot be supplied in sufficient quantities from Westphalia, their price now is against them in coast towns. Unless the mark takes another drop, German coal will for some time be out of competition in such territories. Under such conditions, it would be against the interests of the shipping trade to keep the restrictions on coal imports in force. Foreign coal has already been placed on the same footing in taxation with domestic coal. The control of coal imports remains in force, but it has been greatly relaxed. Its complete removal, however, is only a question of time. There are strong reasons to believe that a free market of coal will have to be established soon.

It is unreasonable to suppose that coal prices will stay at their present level. The upward tendency is still too strong. The rapid rise of coal prices cannot fail to impart a strong impetus to the movement of other commodities of everyday use, which in turn must react upon the cost of labor. Miners' wages have been keeping pace with the rise of coal prices, having recently been increased 40M per shift. On the heels of this rise, the miners have asked for a further increase, which if granted will cause coal prices to be readjusted at a still higher level. Apart from the cost of labor, however, an increase in prices hardly can be avoided, for the mine owners must be enabled to set aside a certain sum toward sinking funds. Appropriations hitherto made for this purpose have been inadequate. Renewals and modernizing of equipment, especially for the coking plants, the need for which has become very pressing, can no longer be postponed. It is now clear that no further material increase of production can be expected from swelling the number of miners, therefore in view of the ever growing cost of labor, higher efficiency has become the keynote of the situation.

The time seems near at hand when conditions will call for a halt in the upward movement of coal prices. As it is, there is no margin left to satisfy the reasonable claims of the mine owners for a certain share of the price increases, which of late have largely been absorbed by wages. Otherwise, the mines will be forced to look elsewhere for financial support, which can be found only among the large consumers. This will inevitably lead to complete vertical trustification.

The attitude of the administration, which looks upon such trusts with ill favor, is rather illogical when judged by its veto of the new constitution of the coal syndicate. The latter provides that pure mines desirous of maintaining their independence be enabled to conclude substantial long-time contracts with consumers outside of their syndicate ration as a substitute for the advantages mines incorporated in vertical trusts enjoy with regard to financial support. This action of the administration instead of preventing the formation of combines is likely to encourage it. Apart from this, the administration has decreed that a combine between producers and consumers shall not be privileged in the matter of free supply from the one to the other unless the former hold at least 80 per cent of the capital of the latter, instead of 50 per cent as has been proposed. This may put obstacles in the way of combines, but will not obstruct them.

The aim of the administration has, of course, been to prevent further increase in the leakage which such combines cause to the quantity of coal at the disposal of controlled distribution, with an eye upon the attitude of the population, chiefly the working classes. Its attitude is only justifiable as long as the present scarcity lasts. Much will depend upon how conditions shape themselves in Upper Silesia—how much of the Upper Silesian production can be preserved for Germany proper. The question whether the present level of coal prices will influence the size of the coal tribute to France and Belgium also will be an important factor in the coal situation. The developments in this direction are being watched with the greatest attention.

Coal Wholesalers, in Convention at Detroit, Chafe At Hoover Plan to Control Coal Market

Will Try Again to Reach Better Understanding with Secretary of Commerce—Rage at Each Other Over Cushing and Costs—Feel That Their Association Is Strengthening

By E. W. Davidson*

A GOOD deal of war in committee and an occasional outbreak of belligerent language in open session marked the sixth annual convention of the American Wholesale Coal Association in Detroit June 1 and 2. The big questions were: What should the association do about the Hoover plan of controlling the coal market, and should George H. Cushing, the active managing director, be continued at Washington. Both were live issues, to put it mildly. Much opinion was loosed throughout the sessions but it can hardly be said that either question was completely settled. Association men hardly knew what they could do about Mr. Hoover's apparent failure to put a wholesaler on his little "privy council" of coal men and his apparent failure to recognize that the wholesaler must make a small but clear profit if he is to stay in business. However a committee is to meet Mr. Hoover this week. The case of Cushing remained more or less on the lap of the gods at the end of the convention, though it is presumed that a majority of the new board of directors are friendly to the managing director.

One thing appeared sure during the convention: The bulk of the association is not going to let the organization die, in spite of the loss during the year of 194 members. A good deal of spirit was roused in the association over one issue or another and the majority of delegates recognized that there are troubles ahead and that in union there is protection for all. As Noah H. Swayne, 2d, one of the association's stalwarts, said after the convention was all over: "It seems as if every time we begin to weaken, the government or somebody does something that drives us to unite again." And so the association, with Seth W. Morton, of Albany, N. Y., as its new president and with a number of economies in mind for the future, may be getting its second—or sixth—wind as it starts its new year after having overspent itself by about $11,000 in 1921.

Offers His Business Outright to Coal Trade

At least one other feature made this convention notable. General J. B. Sanborn, of Chicago, who has spent forty-four years in the coal trade and who has conducted a credit service most of that time, astonished—not to say confounded—most of the association by offering to give his business outright to the coal trade. He proposed that it be conducted as a national credit service for coal shippers and coal producers. The convention thanked the general for his unusual offer and referred the matter to committee.

"I didn't expect them to do anything about it yet," said General Sanborn, "but the seed is planted. It may take two or three years for it to sprout. The plan is feasible and I hope some day it will be adopted. I will never sell my business, though I have lately had some excellent offers for it. I would much rather see it taken up by the coal trade co-operatively. If the coal trade doesn't want it, then when my active days end—pretty soon—I'll just close it up."

Naturally a great deal of discussion, both in session and out, centered on the present coal emergency and the itch of governmental fingers. Not much was said about the strike as such. But the majority of opinion was that the wholesaler is threatened with a rather battered and misshapen form of square deal in the Hoover market-control plan for the strike period. It would be fairly accurate to say the wholesalers feel with their 1921 president, W. R. Coyle, of Bethlehem, Pa., that the present approach is wrong. With him, they size up the situation thus:

(1) If you regulate price you reduce production.

(2) Stimulate production and the price takes care of itself.

(3) In times of emergency all persons should confine their inquiries and their dealings, so far as practicable, to their normal source of supply or to established known wholesalers in their own vicinity.

(4) The best aid which the railroads can give will be found in the temporary suspension of prohibitive demurrage and reconsignment charges and the restoration of at least one free reconsignment at all established terminal yards.

Discuss Hoover Plan and Future of Association

Much talk of both the Hoover plan and the future of the association which was heard Friday morning at the closing session of the convention resulted in a partial clearing of the atmosphere by the electric discharge method, but no definite action on either matter was taken beyond the adoption of a couple of rather general resolutions.

The question of where the coal wholesaler stands in the Hoover scheme of things is indistinct in the association's mind. Two of the officers of the association visited Secretary Hoover a week ago, making clear that wholesalers feel that they should be allowed to realize approximately 10 per cent above the mine price on all tonnage they handle, and that they should have a man on Mr. Hoover's "advisory council" of five. When they left they were under the impression that Mr. Hoover was in accord with their wishes. Press dispatches indicate they were in error. A member of the board of directors said on Thursday night that an exchange of telegrams took place Thursday between association officers and the Department of Commerce at Washington, indicating that Mr. Hoover felt that coal operators are going to "absorb selling costs" in the mine prices set by Mr. Hoover instead of allowing a definite profit for jobbers. Furthermore there appeared some doubt as to whether the wholesalers were to be represented on the "council." The final wire from Washington requested that the new officers send a delegation to visit Mr. Hoover about June 5. This the association decided to do.

In the telegraphic discussion with Mr. Hoover's depart-

PRESIDENT SETH W. MORTON AND SOME STALWARTS OF THE AMERICAN WHOLESALE COAL ASSOCIATION

Standing, left to right: C. L. Dering, retired vice-president and now a director; E. M. Platt, first president of the association; C. L. Couch, a past president; Noah Swayne, 2d, a past president, and H. J. Heywood, member of executive committee. Sitting, left to right: G. H. Merriweather, secretary-treasurer; Seth W. Morton, new president, and Jay W. Johns, new vice-president.

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*Western editor, *Coal Age*

ment Major Coyle tried to relieve the Secretary of Commerce of the impression that coal operators "always have absorbed a reasonable allowance for selling expense." He assured Mr. Hoover that operators never have done that.

At the Friday session Mr. Swayne took occasion to voice his personal code of business ethics for a trade situation such as that of the present, and was cordially applauded. Said he: "I think it right for me to buy coal for definite customers, paying whatever I have to pay, and selling at that price plus 10 per cent, but never to buy a ton for speculation."

RALLY TO GEORGE CUSHING'S DEFENCE

The difference of opinion in the association over continuance of the Washington office along the lines of past activity under the guidance of Managing Director Cushing broke into the open Friday morning. E. M. Platt, of Chicago, declared the association performs too valuable a service to be allowed to die, but that perhaps the dues should be lessened. "If we had the money we should continue the Washington office and its full functions," said he, "but if that work is too costly for us to bear, the time to correct our errors is now, not after it is too late."

J. W. Johns, vice-president, said there should be no reduction in dues. The association, said he, gives a coal wholesaler his only "business insurance" against undue government interference and other harassments, and it is worth a good deal more than the $2 a week it costs Class A members. Mr. Weinhart, of Grand Rapids; Mr. Martin, of Omaha; Mr. Taylor, of Morgantown, W. Va., and Mr. Ratterman, of Cincinnati, put their cities on record in favor of the retention of the Washington office and Mr. Cushing.

"I'm for Cushing," stated Mr. Dunn, of Detroit. "I'd rather be on a ship with a master and that is headed somewhere, than to be on an aimless drifter." He said the value of Mr. Cushing's services should not be measured by expense alone. Six thousand dollars was wasted fighting other people's battles in the recent Interstate Commerce Commission rate case, he said, but such mistakes cannot be charged to Mr. Cushing. He urged that the association quit fighting within itself and back up its representatives in Washington. "We once had 640 members when our business was endangered," said he, "and we'll have 640 again if the government hammers us too hard."

Mr. Cushing took the floor long enough to say that he believed the association's expenditures during the past year were $11,000 above income, but that this did not presage ill for the coming year. About $6,000 of it, spent on the rate case, was extraordinary and probably never will be duplicated, and the same can be said of the $3,000 spent to oppose the Frelinghuysen bill. He added further that he had proposed two months ago that his own salary be cut $3,000 from $10,000, so that during the coming year, he thought, the association should at least break even.

Immediately after the last session of the convention the new board of directors went into executive session and stayed there continuously from 12:30 p.m. to 3 p.m. without stopping for luncheon. Much violent difference of opinion was freely expressed, but at the end no definite decisions were reported. The board is to meet again soon to decide what to do about the Washington office and the association's finances.

There was no open competition for any of the official positions in the association. Seth W. Morton, of the W. G. Morton Co., Albany, N. Y., was chosen president without the suggestion of another name. Jay W. Johns, of the Straub-Atkinson Coal & Coke Co., of Pittsburgh, Pa., was unanimously chosen vice-president after H. L. Forstbauer, of the Lake City Coal Co., of Cleveland, had withdrawn. G. H. Merriweather, of Chicago, was retained as secretary-treasurer.

This is the board of directors: R. S. Bain, of Cleveland, Ohio; C. A. Weinhart, of Grand Rapids, Mich.; J. B. Ratterman, of Cincinnati, Ohio, W. H. Weller, of Birmingham, Ala.; John Cochran, of Indianapolis, Ind.; I. I. Sheehan, of Baltimore, Md.; C. F. Dunn, of Detroit, Mich.; G. H. Reeves, of Minneapolis, Minn.; C. W. Moss, of Buffalo, N. Y.; H. J. Heywood, of Toledo, Ohio; Clarence L. Clark, of New Haven, Conn.; W. E. McCurda, of Boston, Mass.; W. D. Eyre, of New York, N. Y.; George Schwartz, of Columbus, Ohio; W. J. Prescott, of Memphis, Tenn.; C. G. McGill, of Toronto, Can.; M. L. Taylor, of Morgantown, W. Va.; Louis Overholt, of Chicago, Ill.; R. H. Lee, of Kansas City, Mo.; J. F. Hershey, of Louisville, Ky.; C. L. Dering, of Chicago, Ill.; F. S. Morton, of Omaha, Neb., and Charles A. Owen, of New York, N. Y. Two are yet to be chosen.

Executive committee men to serve with the president and vice president are C. F. Dunn, H. J. Heywood, C. G. McGill and W. E. McCurda.

Enough keen humor to stimulate the risibles of a wooden Indian with a chipped nose made the convention banquet merry Thursday evening. About 200 men and women heard Edgar A. Guest, nationally known newspaper poet, read some of his "home-made" verse and enjoyed the wit of James Schermerhorn, once managing editor of a Detroit newspaper. Both men were capital entertainers. Noah H. Swayne, 2d, performed the more or less sacred duties of toastmaster with grace and good fun, changing the tone of the assemblage to the serious to dilate upon the unselfishness in which the American Wholesale Coal Association was conceived and born during the war.

"And it still serves unselfishly," he declared. "At every convention it has faced some emergency in that spirit. Just now some unthinking people talk of the discontinuance of the association. Perhaps we have another fight on our hands. If so, let 'em bring it on. We are ready. We'll make that fight while adhering to our firmly maintained policy: 'Service upon reasonable terms for the public good.'"

At the speakers' table with the toastmaster and speakers sat retiring President W. R. Coyle, Managing Director George H. Cushing, C. C. Corey, of Detroit, chairman of the convention committee, Executive Committeemen J. W. Johns of the Straub-Atkinson Coal & Coke Co., Pittsburgh, Pa., and H. J. Heywood of W. A. Gosline & Co., Toledo, Ohio, and James A. Ballard, of the Semet-Solvay Co., Detroit.

During the dinner there was some cheering for and friendly impromptu songs about both Managing Director Cushing and Toastmaster Swayne. Mr. Swayne is always popular at the conventions. He has an excellent singing voice and entertained with a recital in the music room for an hour before the banquet.

Invitations for the next convention were received from New York and Cincinnati and good naturedly extracted from Chicago.

New England's 1921-22 Bituminous Receipts Lowest of Any Recent Coal Year

FINAL returns collected by the Massachusetts Fuel Administration give the total quantity of anthracite received in New England in the coal year ended March 31, 1922, as 10,424,000 net tons, the Geological Survey reports.

Receipts of bituminous coal were 18,356,000 tons, the smallest in any recent year. A notable feature of the bituminous-coal trade for the year was the increasing percentage obtained by tide. Fifty-six per cent of the total receipts came by water from New York, Philadelphia, Baltimore and Hampton Roads, as against only 44 per cent the year before.

SUMMARY OF NEW ENGLAND COAL RECEIPTS (a)
(In Net Tons)

Coal Year	Tide	Rail	Total	Per Cent Tide	Per Cent Rail
		Anthracite			
1916-17	4,963,000	5,487,000	10,450,000	47	53
1917-18	4,151,000	7,878,000	12,029,000	35	65
1918-19	3,981,000	9,011,000	12,992,000	31	69
1919-20	3,499,000	7,310,000	10,809,000	32	68
1920-21	3,744,000	8,505,000	12,249,000	31	69
1921-22	3,382,000	7,042,000	10,424,000	32	68
		Bituminous			
1916-17	13,707,000	9,606,000	23,313,000	59	41
1917-18	12,253,000	11,123,000	23,376,000	52	48
1918-19	15,085,000	10,208,000	25,293,000	60	40
1919-20	9,092,000	9,997,000	19,089,000	48	52
1920-21	9,673,000	12,469,000	22,142,000	44	56
1921-22	10,261,000	8,095,000	18,356,000	56	44

(a) Data furnished by courtesy of the Massachusetts Fuel Administrator.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

STRIKING features brought out by figures relating to industrial conditions for the month of April as received by the Department of Commerce, were further big increases in building construction with attendant larger production of building materials and an increase of some 30 per cent in the production of automobiles. In many other lines the April figures did not show the advance over March conditions that might have been expected from the preceding month. April has been a month rather of assimilation and of adjustment of conditions for progress in later months.

It is very encouraging that business for the most part is advancing in this less spectacular but more substantial manner. The fact that prices have been relatively much more stable in recent months and that some increases are taking place in commodities which have been below the general level, indicates improved fundamental conditions.

Receipts of wool at Boston during April amounted to 34,194,000 lb., compared with nearly 40,000,000 lb. in March and 51,000,000 lb. in April last year.

The per cent of active hours for all classes of wool machinery was less than for the preceding month, while the activity of cotton spindles decreased from 7,779,000,000 hours in March to 6,636,000,000 hours in April. The average activity per spindle in place decreased from 211 to 180. These figures bear out the data on the smaller consumption of cotton by mills in April, as previously reported.

Exports of cotton cloth increased in April with a total of 51,615,000 sq.yd., compared with 48,406,000 in March. Silk imports remained stationary, while imports of burlap and fiber declined.

Production of sheet steel, as shown by association reports, increased from 68 per cent of capacity in March to 75.2 per cent in April. Shipments and unfilled orders also increased, while sales and unsold stocks declined. Exports of iron and steel showed a decrease of 10,000 tons from the March total.

The production of passenger automobiles as compiled from reports to the Bureau of the Census increased from 152,647 in March to 196,512 in April. This is an increase of nearly 30 per cent in the month and represents the largest output reported in any of the last 10 months for which these figures are available. Truck production also increased from 19,449 to 21,944 and again shows the maximum figure for any month reported.

Imports of hides and skins increased slightly, while the exports of leather declined. The exports of boots and shoes amounted to 463,000 pairs in April, compared with 455,000 pairs the month before. A year ago nearly three times as many boots and shoes were being exported each month.

Exports of wheat, including flour, were equal to 10,244,000 bushels in April, a decline of 4,000,000 bushels from the March total and less than half as much as in April last year. Corn exports, with a total of 18,817,000 bushels, showed a slight decrease from the record made in the preceding month.

The wholesale price index of the Department of Labor remained stationary at 152. Slight increases in farm products, fuels, metals, and chemicals, were offset by declines in other groups. The cost of living as reported by the National Industrial Conference Board also showed no change from the March figure.

Freight Loadings Continue to Gain

Loading of revenue freight during the week ended May 20 totaled 792,459 cars, compared with 777,359 during the preceding week, or an increase of 15,100 cars. This was an increase over the corresponding week last year of 21,468 cars, but a decrease of 69,615 compared with the corresponding week in 1920. Coal loadings amounted to 81,967 cars, a gain over the previous week of 2,797. This was, however, 78,665 under the corresponding week last year and 87,082 below the corresponding week two years ago. Coke loadings totaled 9,335 cars, 522 more than were loaded the week before.

On May 23 there were 504,702 freight cars idle because of business conditions, compared with 512,196 on May 15, or a decrease of 7,494 cars. Surplus coal cars numbered 208,691, a reduction since May 15 of 9,775. An increase of 256 cars, however, was reported in the number of surplus coke cars.

Structural Sales Near Capacity

Orders for fabricated structural steel placed during April were almost equal to the capacity of fabricating firms, according to reports made to the Department of Commerce by firms comprising two-thirds of the fabricating capacity of the United States. Sales reported during April amounted to 115,247 tons by 75 firms having a capacity of 116,916 tons, or at the rate of 99 per cent of capacity. At this rate, the total sales throughout the United States, based on a total capacity of 180,000 tons, were 177,600 tons in April. This compares with 139,300 tons reported for March by the Bridge Builders & Structural Society.

Minnesota Rail Mill to Open

The Minnesota Steel Co. will start operating its steel rail mill about the middle of this month, according to recent reports in the New York financial district. The mill is reported to be the most modern in the Northwest and is favorably situated for supplying the Middle Western, Northwestern and Pacific Coast railroads.

Rail Shops Resume June 5

Full force activities were resumed June 5 at the Ontario & Western locomotive department, Middletown, N. Y. Increasing need of motive power equipment to meet the demands of the increasing summer passenger traffic is stated as the reason. The locomotive department had been working with a greatly reduced force since April 7, when 272 employees of the department ceased work as a result of the curtailment of traffic by the strike of the coal miners.

Supreme Court Holds That Unions May Be Sued, but In Coronado Case Union Is Not Liable for Damages

IN a unanimous opinion delivered by Chief Justice Taft, June 5, the U. S. Supreme Court held that labor unions may be sued in federal courts for violation of law. The court reversed the Circuit Court of Appeals, Eighth Circuit, which gave treble damages, $600,000 plus $25,000 attorneys' fees, and $125,000 interest, to the Coronado Coal Co. against the United Mine Workers, District 21 (Arkansas), for destruction of the coal company's property in Arkansas during a strike in 1914. The basis of the decision to set aside the damages was that the strike was a local issue and not a conspiracy by the organization as a whole to restrain commerce in violation of the law.

On the ground that there was nothing in the evidence to show that the International union or international board of the United Mine Workers had authorized the strike or taken any part in preparation for it or in its maintenance or had ratified it by paying any of the expenses, the court concluded that the International union and its officers should not have been held by the trial court as subject to joint liability with the district and local organizations and officers for participation in the conspiracy or for the destruction of property incident to the strike.

The authority placed by members of District No. 21 in their officers to order a strike, it was held, made the district organization responsible for any unlawful injuries inflicted during the conduct of the strike and made the fund accumulated for strike purposes by the district subject to the payment of any judgment which is recovered.

It was necessary, however, in order to hold District No. 21 liable in this case under the anti-trust act, to establish that the conspiracy to attack the Bache-Denman mines and stop non-union employment there was with intent to restrain interstate commerce, to monopolize it, and subject it to the control of the union, Chief Justice Taft stated.

While unincorporated labor organizations could be sued under the Sherman anti-trust law for triple damages for losses to property caused by them, there was nothing in the evidence of the present case, it was declared, to show that the acts complained of were aimed by the labor unions to restrain interstate trade.

Pointing out that the United Mine Workers is admirably framed for unit action, that it is directed largely toward propaganda, and that most of its expenses are devoted to strikes, the court says labor organizations exceed corporations in unity of action. Pointing out various forms of state and federal legislation recognizing labor unions, the court holds "that the suable character of such an organization as a labor union has come to be recognized. We think that such organizations are suable in the federal courts for their acts and that funds accumulated to be expended in conducting strikes are subject to execution in suits for torts committed by such unions in strikes," the court says.

The court took occasion to define the extent to which Congress may legislate on coal, which is of timely interest in view of proposed regulation. The court said: "Coal mining is not interstate commerce, and the power of Congress does not extend to its regulation as such. The mining of coal is not interstate commerce nor does the fact that it is to be afterward shipped or used in interstate commerce make its production a part thereof. Obstruction to coal mining is not a direct obstruction to interstate commerce in coal, although it of course may affect it by reducing the amount of coal to be carried in that commerce. If Congress deems certain recurring practices, though not really part of interstate commerce, likely to obstruct, restrain or burden it, it has the power to subject them to national supervision and restraint. It has the power to punish conspiracies, in which such practices are part of the plan to hinder, restrain or monopolize interstate commerce. The intent to injure, obstruct or restrain interstate commerce must appear as an obvious consequence of what is to be done or be shown by direct evidence or other circumstances."

Plans for $35,000,000 Coal Merger Said To Be Nearing Completion

STORIES of the contemplated merger of thirty independent coal compaines in the Panhandle district of western Pennsylvania were revived last week through John A. Bell, Pittsburgh banker and chairman of the board of directors of the Carnegie Coal Co. "The merger may take place in a month or two," Mr. Bell said. The consolidation would bring under one corporation approximately 50,000 acres of coal land, most of which is undeveloped, and the corporation would have a capitalization of $35,000,000. Mr. Bell stated that the deal had been under consideration for about six months, but that the time was not yet ripe for the announcement of the names of the companies involved. J. H. Sanford, president of the Carnegie Coal Co., and William Henderson, president of the Henderson Coal Co., also are named in connection with the proposed merger.

Coal Consumption by Utilities Falls to Lowest Level Since Last July

COAL consumed by public utility plants during April totaled 2,491,091 net tons, according to figures just published by the Geological Survey. This was less than the tonnage consumed by these plants during any month since July, 1921. During March the total fuel consumption was 2,722,952 tons; in February, 2,593,259; January, 2,953,540 and in December, 2,902,987 tons.

A comparison of the reduction in the average output of electricity in the important coal-producing states in April with the reduction in output of electricity for the entire United States in that month shows that the coal strike reduced the public-utility output of electricity in the coal-mining states by about 4 per cent. The proportion of the total kilowatt-hours produced by water power increased steadily from 33.5 per cent in November to 40.6 per cent in April, while the average daily output in kilowatt-hours declined to 120,300,000 in April from a figure in excess of 123,000,000 during the preceding four months.

Coal Consumption by Roads Up in March; 3-Months' Total Less Than Year Ago

CONSUMPTION of coal by Class 1 railroads in March, 1922, reported by the Bureau of Statistics of the Interstate Commerce Commission, as charged to account 394, was 8,503,000 net tons, as compared with 7,711,000 tons in March, 1921. Including the equivalent coal tonnage for fuel oil consumed the coal consumption in road service was 9,293,029 and 8,470,575 tons respectively. Although the figures for March of this year show a considerable gain as compared with 1921, consumption of coal charged to account 394 for the first quarter of 1922 was less than for the corresponding period a year ago, the figures being 24,436,000 tons, against 24,611,000 tons in 1921. Including the equivalent coal tonnage for fuel oil consumed the coal used in road service was 26,749,260 tons and 26,969,315 tons respectively.

With the heavier March consumption the roads have made a considerable saving in their fuel bill, as the cost of coal per net ton is given as $3.49 this year, which is more than a dollar below March, 1921, when the cost per ton was $4.55. For the first quarter of 1922 the cost was $3.56 per ton; in 1921 it was $4.58. During the first quarter of 1922 the net revenue and non-revenue freight ten-miles amounted to 88,000,000, as compared with 82,000,000 last year.

Epoch in Industrial Progress Seen in Co-operation in Hoover Plan to Keep Coal Prices at Fair Level

By Paul Wooton
Washington Correspondent of Coal Age

NEW proof of the ability of Herbert Hoover, Secretary of Commerce, to get results is had in his handling of the coal-price situation. He has handled it in a way which is meeting with the approval of 99 per cent of the operators, in spite of the fact that he is preventing them from recouping the losses most of them have sustained in the sale of their coal during the past year.

When the operators gathered for the general price conference on May 31 there was a minority among them which did not look with favor on the plan of applying the Garfield scale to their free coal when most of their output is moving on low-priced contracts. The opposition, however, was won over completely by Mr. Hoover's remarks at the opening of the conference. It is believed that the policy of co-operation between the government and industry, outlined in that speech, marks an epoch in industrial progress. The full stenographic record of Mr. Hoover's remarks follows:

"I have been asked by the President to call this conference for the purpose of consultation with you as to what measures we can properly take to restrain runaway prices, profiteering and speculation in coal during the present coal strike. This is not to be a discussion of the strike nor of wage questions but purely a discussion between the Secretary of Commerce and the producing operators upon the sole question of price and distribution of coal.

"You are aware of the facts in the present situation as well as I. At the present moment bituminous coal is being produced at the rate, approximately, of five million tons a week. Consumption is somewhere from eight million to eight and one-half million tons a week. We are drawing upon stocks at the rate of three million to three and a half million tons a week. Production will probably increase slightly as time goes on. But the time has arrived when those unwise virgins who did not accept the recommendations I repeatedly made as to stocking themselves with coal, find themselves compelled to go into the market. Distribution is greatly disturbed from its normal channels. There is a tendency to multiply bidding from the public and thus to force up the price of coal against itself.

"On the last occasion when there was disturbance in coal production, prices rose at some mines from $6 to as high as $10 and $12 and even $15 a ton for spot coal at the mine, and all holders of coal raised their prices accordingly. Such a condition represents a loss on spot coal to the public running into millions of dollars a week. It gives to the industry a color of profiteering, and it is my distinct recollection of that period that the charge given the operator was not only laid against many unjustly but that the vast majority of operators considered that in its reactions it was the most disastrous thing that had happened to them.

"It is utterly impossible for each operator to act alone. Many hundreds of operators during that occasion held to their price list despite the offers that were made to them and despite the fact that coal which they placed on board cars at a comparatively low price was sold under their eyes at double and treble the price at which they had turned it out. I had felt that before such an occasion arises again it was desirable that we take such steps as we can take to prevent its recurrence.

"A week ago I called a preliminary conference of some thirty or forty coal operators to determine what steps might be taken, in their view, and to test out the disposition of producing operators in this matter. Those gentlemen were unanimous and emphatic in an expression of the necessity that restraint of some kind should be placed upon the existing situation, not only in the interest of the public but in the interest of the operators and the fundamental interest of the whole industry. Upon their suggestion the President directed me to call this larger conference.

"The result of the last conference, a week ago, has been to put a check on the daily rise in price that was in process, and prices have receded from 50c. to $1 a ton nearly throughout the country. Prices today vary somewhere from $2.50 to $3.50 a ton at the mines in most districts, although there are one or two districts that are still over the $4 level.

"What we are interested in—what the public is interested in—is not the question of cents; it is the question of dollars. With the unrestrained operation of the law of supply and demand in a situation of this kind the price of spot coal might easily be carried to $12 or $15 a ton at the mine, and any such situation as that, I believe you will agree with me, must be prevented if we can.

"I have some little knowledge, perhaps, of the situation in the coal industry as it has existed during the past twelve months. I am fully aware that the industry as a whole has operated without profit, and perhaps even at a loss; that prices to the public have been unduly low so far as the mine operator is concerned; that differences in price of 10c. or 15c. or 20c. a ton make the difference between profit and loss in coal production. The public does not realize, I believe, that these are the margins for which the operator must contend. With high freight rates, with high cost of retail distribution the public has little appreciation of the secondary part that prices at the mines pay in the ultimate cost to the individual of coal put in his cellar. Nevertheless the operator has, in the public mind, the primary responsibility for the price of coal, and it is with a view to summoning that responsibility, in the public interest and in the interest of the industry, that we are meeting here at this moment.

THINGS THE PUBLIC SHOULD UNDERSTAND

"There are some things that the public should understand in respect of this problem:

"(1) That it is a problem of the most stupendous difficulty, that it is easy to denounce profiteering, in fact it is the favorite sport.

"(2) That the vast majority of the coal operators, out of their own interest and out of their sense of public interest, do not wish profiteering in coal.

"(3) That where profiteering begins and ends is not a question of demagogic statement; it is a question as to a definite fair price. There is no use of arguing theories when it comes to determine what must be done in a practical world, but it becomes a problem of determining the actual basis upon which fair transactions should take place if actual constructive work is to be done in the situation.

"(4) What a fair price may be depends upon conditions in each district and varies not only with each district but with different mines in each district.

"(5) That the majority of the coal is sold in contracts established before the strike and that price fluctuation refers only to spot or free coal.

"(6) The public should understand that there is not a shred of law or authority to either determine or enforce a fair price; that there is not a single shred of law on the statute books of the United States Government in prevention of profiteering or anything of that character.

"(7) That the law itself prohibits coal operators agreeing among themselves as to what a fair price would be, even if the operators should place that fair price below cost of production. We may as well face the fact that a combination in the public interest is just as illegal as one against the public interest. Without entering into the merits or demerits of the local situation that is the actual case.

"In times like these, in emergencies of this character, someone has got to take the responsibility, someone must take the leadership and say what is fair. I do not believe that men deserve to hold public office unless they are prepared to accept the responsibilities that arise in emergencies.

"I, therefore, am not going to shirk this responsibility by asking you to enter into any agreement or combination among yourselves to restrain trade or prices or to do anything else that is wrong in law, whether it is in the public benefit or not. I propose to inquire, with your co-operation, as to the situation in the various districts; I propose to consult with you and to co-operate with you; I am going to take the responsibility upon my own back of saying what is fair, and I am going to ask every individual operator as a public service to adhere to such basis in his district, and that is to be a moral agreement between him and me. If he should fail to keep that agreement it will be between himself and his conscience. I may have remarks to make about it but I have no power to enforce it.

"I have no desire to assume unnecessary responsibilities, responsibilities that are bound to carry unusual loads of criticism; but there is a question here of protecting the public from losses that might aggregate $15,000,000 or $25,000,000 a week; aye, there is even a greater responsibility than that, and that is to save the business men of the United States from undeserved criticism by reason of being thrust in a position that they cannot themselves alone prevent.

"There is no question in mind as to the high sense of public service among the business men of the United States; that they want above all things not only to maintain but to demonstrate their right to esteem in the community, and I would be a failure as Secretary of Commerce if in representing these men I did not give opportunity to make such demonstration and to offer such public service. I am, therefore, suggesting to you a co-operation between each of you individually and the Secretary of Commerce.

PRELIMINARY PLAN ELICITS ADVERSE CRITICISM

"Last week we prepared, after considerable discussion, a preliminary plan, a plan that I have no doubt would have been effective. That plan, however, has been criticised in that it might contain elements of restraint of trade by co-ordinate action between yourselves. I will not ask you to enter into any plan that might be subject to that suspicion, even though it be in public interest. The plan proposed then would be more effective than that which I now have to propose. The plan I propose here depends solely upon moral forces and good will.

"It becomes necessary, then, that I should propose to you for discussion some alternative to that plan that will free it absolutely from any taint of suspicion or criticism as a conspiracy in law to restrain trade. In doing so I would like to make the emphatic statement to the public that the administration is here seeking co-operation of each individual coal operator in the public interest; that if such co-operation fails it will not be a failure of the administrative officials. I am confident that the vast majority will adhere to the plan proposed. If it won't work in a minority it will be a failure in authority of administrative officials. But I do not believe we will fail; in fact, I believe that here will be offered an opportunity to the business men to demonstrate that moral forces can be established that will prove that the arm of the law is unnecessary in the matter of protection of the public interest.

"Now, gentlemen, we are all busy people and I would like to make one or two propositions to you for your views:

"(1) That the Garfield prices for run-of-mine coal should be the basis for computing sales prices, with such adjustments as are necessary to include the wholesale selling costs, changed conditions at the mines, and other factors that will be fair to the public and to the operators and will maintain production of coal. Any agreement to adhere to this is a moral agreement between each individual operator and myself.

"I know that there is some objection, and some rightful objection, to using the Garfield prices as a base. On the other hand, we have no time, we have no machinery for determining what is detailed right or wrong in the matter of price. The Garfield prices were the result of experience extending over a considerable period of time and an elaborate series of investigations, and it is much more easy, it is much more facile, and much more practical to say broadly what are the necessary changes to be made in such basis than to go out and endeavor to establish a new base at this moment.

"We know, approximately at least, the changes in wage levels. We know, approximately, those districts where the Garfield prices proved to be unfair. We know the changes that were proposed by the old Fuel Administration in those prices had that work continued. We know that a large proportion of the coal is sold on contract at prices below the Garfield levels. We know that this problem is a problem of spot coal alone. We know many of the factors that have entered into the question. The public is not interested in the question of cents; the public is interested in the question of dollars. Therefore my feeling is that we can arrive quickly at some notion of a fair price which I can state after discussion with you as to these changed conditions, whereas otherwise we would be at sea for weeks.

"(2) My suggestion is that each district should today nominate to the Secretary of Commerce a committee of the district to advise with him as to the conditions that bear upon the Garfield level and upon which I may form some judgment as to a fair price for the district.

"(3) After we have made this primary determination these committees should continue and should report to me any unfair prices in their respective districts, and should act on my behalf and as I may direct them to do in individual cases that may arise in their respective districts.

COMMITTEE TO ACT AS A MORAL FORCE

"In other words, the latter part of the machinery is altered to the extent that I wish to appoint a committee in each district to represent me purely in the capacity of a moral force in securing a fair price that I must take the responsibility of stating after I shall have learned as well as I can the conditions in each district.

"The whole of this is purely temporary expedient during this strike; I do not know how long the situation will last; it may be months for all that I know. I should have been glad to propose to you machinery that would relieve me of this major responsibility, of machinery that would be absolute, but I cannot do so without imposing upon you certain responsibilities and risks that I have no right to ask you to take.

"I do not ask you to vote or take any collective responsibility on this proposition. I wish your individual views. This is a transaction between me and each individual operator. If anybody is to be called into question for this agreement it is I alone and I will stand it. I shall be better able to judge the situation when I have had your views.

"I will now call on some of those present for discussion. I would like to call upon all of you but it happens I do not enjoy your personal acquaintance and therefore I may not call upon some who will be able to give us valuable suggestions. I first call upon Mr. Ogle, the president of the National Coal Association."

Mr. Ogle expressed the opinion that every one of the operators who had assembled would pledge his individual support in such co-operation. He took occasion, however, to point out that "the Garfield price applied to all coal, contract and spot, and for that reason it is only fair in determining the price of spot coal that the average realization should be taken into consideration.

"We all welcome the opportunity, Mr. Secretary, that you have given us to demonstrate that the coal industry can and does recognize the responsibility of public service, and that we can of ourselves work out our own problems, in co-operation with you, so that at the end of this strike you can say to us and to the coal industry in general that it has performed its duty."

J. G. Bradley drew a round of applause when he gloried in the fact that he is a non-union operator, independent of labor domination. He declared, however, that the industry needs the protection of a man like Secretary Hoover when public opinion has been inflamed "by those who are trying to create a labor monopoly in our industry, trying to create a coal panic, and trying to put every fair coal operator 'in bad.'" He urged the operators to put a will behind the Hoover program and make it a go.

The service being performed by the Secretary of Commerce was referred to by D. B. Wentz, when he addressed the assembled operators, as follows: "This is the third emergency in coal in the last five years. I wish to bring it forcibly to the attention of operators that this is the first occasion when the administration has said to the coal operators of the United States: 'We want to help you take care of this thing. This is your affair but we want to help you. We will take the responsibility of helping you.'"

At the close of the general conference Secretary Hoover designated a committee of five to act as his immediate advisers. He selected the following to serve on that committee: A. M. Ogle, president of the National Coal Association; C. E. Bockus, president, Clinchfield Coal Corporation; A. H. Holbrook, acting director, U. S. Bureau of Mines; George Otis Smith, director, U. S. Geological Survey, and F. R. Wadleigh, head of the coal division of the Department of Commerce.

On the day following the meeting, Secretary Hoover authorized a statement, in part as follows:

"It should be understood that the whole object of the administration's interest in coal prices is to protect the consumer by indicating the maximum price that would be fair for spot coal during the temporary period of the strike, and by doing so, to protect that great group of operators who do not wish to take advantage of the present situation.

"In order to prevent the resale of coal for speculative purposes it is most desirable in the interest of the consumer, operator and wholesaler that the operators and dealers should insist upon knowing that purchases are on behalf of a definite consumer.

"Every consumer who is interested in knowing that he gets a square deal can easily check the freight rates, can compare them with the maximum price, can inquire from his dealer whether he is buying contract coal, and at what rate, and can make proper allowances for retail distribution. If consumers are unwilling to take this degree of interest in negotiating for coal it is a certainty that no one can help them. I believe the vast majority of operators, wholesalers and retail dealers sincerely wish that this difficult occasion shall pass by without any rightful criticism of their conduct anywhere along the line. I regret that a small minority have refused to co-operate and are demanding higher prices. The government has no authority in the matter, for this is purely a moral question and one of co-operation. The consumers who are not treated fairly may appeal to this department in Washington and their case will be inquired into."

Charges Vintondale Mine Police Abrogate Rights of Free Speech and Assemblage

FOLLOWING a trip to the Pennsylvania coal fields made late in May by A. G. Hays, a New York attorney, and members of a party sent by the American Civil Liberties Union to test the rights of free speech and free assemblage, Mr. Hays has instituted proceedings against eight coal and iron police and coal company officials at Vintondale, Pa. The Vinton Colliery Co., of Vintondale, is the defendant in the suit prepared by Mr. Hays, which is for "assault, battery and false arrest" on behalf of himself and members of his party, who are alleged to have been attacked by coal and iron police in Vintondale on May 27.

Mr. Hays states that on their arrival in that town for the purpose of holding a meeting to test the rights of free speech they were ridden down by armed guards, who ordered them to leave town immediately. They found Vintondale an armed camp with the company police mounted and heavily armed, permitting no one to congregate on the streets. On returning from a nearby town armed with warrants for the arrest of the policemen Mr. Hays was arrested on the charge of trespassing on the coal company's property.

Roger Baldwin, director of the American Civil Liberties Union, says that the co-operation of Samuel Untermyer, prominent New York attorney, has been obtained and that the union will take every legal step to bring about a change of what is described as "well-nigh incredible conditions in the Pennsylvania coal fields."

L. I. Arbogast, Harry McArdle, John Butalli, James Dempsey and Richard Esaias, employees of the company, waived a hearing before Justice of the Peace Robert Harnish at Nant-y-Glo on June 1, on the charges preferred by Mr. Hays. All entered bonds in the sum of $500 for their appearance in the Cambria County Court.

It is stated that injunction proceedings also will be started against the operators and their police "to restrain them from interfering with access to Vintondale and from breaking up proper assemblage and restraining freedom of speech."

The president of the coal company, Clarence M. Schwerin, with offices in New York, has taken issue with the union and says he will take the case to the Supreme Court if necessary.

Senate Directs Secretary Hoover to Make Inquiry in Coal Strike

AN echo of the Hoover coal-price regulation conference was heard in the Senate when that body adopted a resolution presented by Senator Walsh, of Massachusetts, calling on the Secretary of Commerce for detailed information in respect to coal supplies and prices. Senator Frelinghuysen, of New Jersey, took occasion to remind the Senate that it had pending for over a year on its calendar his coal-stabilization bill and that had it been acted on the Senate would now have the information on which to base any action it might desire to take in connection with the strike.

In the House Representative Bland, of Indiana, is seeking action on his bill to establish a coal-investigation agency, having introduced a resolution, which has been referred to the Rules Committee, seeking a special rule for consideration of the bill by the House.

The Walsh resolution recites that as a result of the strike of bituminous-coal miners, consumption of bituminous coal is exceeding the production and the available surface reserve is being rapidly exhausted: that an adequate supply of bituminous coal at reasonable prices is vital to the domestic and industrial welfare of the nation, and refers to the fact that the Secretary of Commerce has been "negotiating with certain coal operators for voluntary agreement to fix prices during the pending emergency."

The resolution asks the Secretary of Commerce to furnish the Senate at the earliest moment all available facts relating to the following:

The present supply of mined bituminous coal.

The average weekly production and consumption of such coal since April 1, 1922.

The amount of bituminous coal estimated to be necessary for all uses in the United States until May 1, 1923..

The effect of the strike upon present coal prices and the probable effect upon such prices if settlement of the strike is not reached before Sept. 1.

What action, if any, has been taken by the United States, through government agencies, to terminate the strike.

What action, if any, has been taken by the United States to protect consumers of coal from paying exorbitant prices by reason of curtailment of production.

CHAIRMEN OF COMMITTEES of the National Coal Association, to serve for the next twelve months, have been selected as follows: Cost Accounting, T. T. Brewster, president Mount Olive & Staunton Coal Co., St. Louis; Statistical, F. C. Honnold, secretary Illinois Coal Operators' Association, Chicago; Membership, Michael Gallagher, general manager M. A. Hanna & Co., Cleveland; Finance, J. J. Tierney, vice-president and general manager Crozer Pocahontas Co., Philadelphia; Publicity, C. E. Bockus, president Clinchfield Coal Corporation, New York City; Government Relations, J. G. Bradley, president Ella River Coal & Lumber Co., Dundon, W. Va.; Railroad Relations, E. C. Mahan, Southern Coal & Coke Co., Knoxville, Tenn.; Foreign, F. W. Wilshire, vice-president Consolidation Coal Co., New York.

Ninth Week of the Coal Strike

EDITORIAL REVIEW

PARTICULAR significance attaches to reported statements of union officials to the effect that the end of the bituminous strike is near. William Petry, of Charleston, W. Va., vice president of District 17, United Mine Workers of America, is authority for the statement that the strike will be brought to an end in less than thirty days. Speaking at Fairmont on June 1 Petry said: "I have the assurance of official heads of the organization that a meeting of the coal operators and the miners' officials will be held not later than June 15, which means the termination of the present industrial struggle. I believe this conference will pave the way for negotiations in the outlying districts, including the northern West Virginia fields, and the possibility of a settlement here."

P. T. Fagan, vice-president of the United Mine Workers of America, in an address at Pittsburgh, Pa., June 4, to nearly a thousand miners from Turtle Creek, Sandy Creek, North Bessemer, Plum Creek, Hays, Renton and Lincoln Place, declared that every indication was toward a speedy settlement of the strike, especially as controversies regarding soft-coal prices and the alleged excessive prices asked by the operators had weakened the cause of the producers to such an extent that the government was now taking a serious interest in the lockout. He asserted that the strike would be over before July and as far as the miners are concerned the worst of the trouble was over.

As against these signs of weakening on the part of the union, important because coming from officials of the scale committees, was the trip to Washington of three operators from Cleveland. S. Purseglove, Cleveland & Morgantown Coal Co.; F. E. Taplin, Cleveland & Western Coal Co., and E. H. Gilbert, Gilbert-Davis Coal Co., called on Secretary Davis on Monday, June 5, presumably to discuss the possibility of an early settlement with the miners. Officials in Washington attach no significance to the conference, as these men represent no one but themselves, it is understood, and have no authority from any scale committee.

Having no strike developments in their own fields, Illinois operators view with interest the efforts of these Eastern operators to talk with Secretary Davis. Dr. F. C. Honnold, secretary-treasurer of the Illinois Coal Operators' Association, issued a statement saying the association knew nothing of the Eastern plan for peace and that operators in Illinois have been expecting mines in the East formerly union to reopen on a non-union basis. Since unions still refuse local conferences in Illinois this cannot be done because of legal obstacles against hiring men outside of unions. It had been the widespread hope in districts outside the Central Competitive Field, reads the statement, that the policy of the national representatives of the mine workers might be changed and permit of negotiations by local districts. That such policy remains unchanged may mean universal repudiation of any further effort to bargain collectively with the miners, as in times past.

The price situation remains easy. The average is below the Hoover prices and the Secretary of Commerce is following up his conference with operators by meeting with retailers and jobbers. On Monday, June 5, the retail coal dealers of the country met with Mr. Hoover and assured the government of their desire to keep down coal prices during the present situation. They stated that their stocks had been rapidly depleted since the strike but that they had not advanced the price because of the strike. Secretary Hoover opposed selling coal at a replacement value, contending that it should be sold at a reasonable profit above that at which it was purchased. The wholesalers and retailers will appoint a representative to Mr. Hoover's advisory committee to work with the government in keeping down coal prices.

The drift back to work continues in the non-union Connellsville coke region. The two Alicia mines of the Pittsburgh Steel Co. are raising a little coal and at Alicia No. 1 plant fifty ovens have been blown in. The Reliance Coal & Coke Co., at Denbo, has increased its output of coal during the past week from one car a day to five cars a day. The Republic Iron & Steel Co. has started the Bowood mine with seventeen miners. The H. C. Frick Coke Co. started the Kyle plant last week with about 20 per cent working force and slightly increased the force at the York Run plant.

Anthracite Operators Propose Arbitration; "Suspension" May Be Declared a Strike

SUSPENSION of mining operations in the anthracite fields has entered upon its third month with prospects of settlement apparently still far away. There were strong indications during the past week that the so-called suspension would be declared a strike by the union officials, which some observers declared would mean the withdrawing from the mines of those men, such as pump runners, who had been left there to protect the property.

The first conference of the joint subcommittee of operators' and mine workers' representatives for the week was held on Friday, June 2, when the operators' committee presented its reply to the miners' refusal to consider the counter demands of the employers.

The reply of the operators was as follows:

"You have stated to us, supplementing your letter of May 28, that further negotiation between us would be fruitless unless we were willing favorably to consider your demands for a large increase of wages, the unreasonableness of which we have endeavored to show you. You have refused at the same time even to discuss our counter-proposals.

"In view of these facts we are faced with the alternative of either allowing the present suspension of operations to continue indefinitely or finding a method of settlement of our differences other than by direct negotiation.

"We fully realize our responsibilities to all concerned, and we have endeavored in every reasonable way to settle the difference between us by honest argument in accordance with the directions of the joint conference of operators and miners.

"We deeply regret the failure to agree. We also deeply deplore the present suspension of operations, which you ordered without previous notice to us at the very outset of negotiations, and which is bringing distress to those dependent upon the industry.

"This condition must not be allowed to continue if there is any feasible means of preventing it. It is the plain duty of both of us to find such a means.

"In view, therefore, of the situation which now exists, we propose that the President of the United States be requested to appoint a commission or tribunal to ascertain and consider all the facts and determine the questions concerning wages and conditions of employment at issue between us, said commission or tribunal to find a practical method by which prompt operation of the mines may be resumed pending its ultimate decision, and also to seek and recommend a method by which future suspensions or strikes may be as far as possible, avoided.

"In behalf of the anthracite operators whom we represent, and for whom we speak, we herewith agree to abide by and faithfully carry out the decision or award of the commission or tribunal so to be appointed by the President of the United States."

The statement was addressed to John L. Lewis, International president of the United Mine Workers, and was signed by T. D. Warriner, W. J. Richards, W. J. Connell and W. W. Inglis.

Philip Murray, vice-president of the United Mine Workers, on his return from a visit to John L. Lewis, is reported to have said to friends that he found Mr. Lewis not averse to arbitration but ready to demand that the body to whom the question is entrusted be instructed not to bring in a report calling for a reduction in wage. Mr. Lewis took exception to the indefiniteness of the second reply of the anthracite operators and to the fact that therein they made no reference to the size and personnel of the proposed arbitral committee. The three district presidents of the anthracite region met on June 6 with Philip Murray to prepare a reply to the operators.

The next conference between the subcommittee of operators and miners will be held at the call of the chair.

The newly organized civic body known as the Public Committee on the Coal Strike has taken a hand in the situation and will endeavor to interest the public. Its first meeting was held on June 1 in the Engineering Societies Building, 29 West 39th Street, which was attended by representatives of the miners, who told the committee that their co-operation in the settlement of the controversy was welcome. Another meeting was scheduled for June 6.

The committee is composed of Frank Pattison, an engineer, of 1182 Broadway; Norman Hapgood, editor; Morris L. Ernst, a lawyer of 7 Dey Street; the Rev. J. Howard Melish of the Holy Trinity Church, Brooklyn, and Frank H. Somer, dean of the New York University law school.

Indiana Strikers Demand That Lewis Call Out Union Miners in Kentucky

COAL miners on strike in the Evansville (Ind.) field have been called to meet soon at Boonville, Ind., to take further action regarding a demand sent recently to John L. Lewis, international president of the United Mine Workers, to call out union miners who are working in Kentucky. It is expected that several hundred miners will attend. Indiana miners assert that many of their number have transferred their memberships to locals in Kentucky so as to work in the mines in that state. It also was pointed out that many of the Kentucky mines now are working three shifts when they should be working only one. A large quantity of union-mined coal is being shipped from Kentucky through Indiana to Chicago and the Northwest.

Conciliation Board Suggests 20 Per Cent Cut for Coal Miners of Eastern Canada

A 20-per cent reduction in the wages of mine workers employed by the British Empire Steel Corporation and its subsidiaries was recommended June 5 in a majority report of a conciliation board at the close of an investigation of the dispute between the workers and the operators.

The majority report, signed by D'Arcy Scott, of Ottawa, chairman, and John E. Moore, of St. John, N. B., recommended that $3 a day minimum for miners over 18, working by the day, be adopted.

A minority report, submitted by the miners' representative, recommended an increase in pay of men working by the day from $2.83 a day to $3.45. It also recommended that contract rates at present in force be increased 18½ per cent.

I. D. MacDougall was the third member of the board, representing the miners. The board was appointed by James Murdoch, Minister of Labor.

OHIO STRIPPING OPERATORS SEEK INJUNCTION—The hearing on the injunction suit brought by a number of stripping operators in Jefferson County, Ohio, to restrain union miners from interfering with their workmen was heard before Judge Sater in Federal Court at Columbus, Ohio, June 1. Previously a temporary restraining order had been issued. The suit was brought by the Harmon Creek Coal Co., Penova Coal Co., Tasca Coal Co., Wayne Coal Co. and the United Coal Mines, Inc., against officers of the state and subdistrict organizations as well as officers and members of the local unions in Jefferson County. No decision had been announced by June 1.

THE SENG CREEK COAL CO. and the Mordue Collieries Co., with mines on Coal River, in the Kanawha field, obtained from Judge McClintic, of the U. S. District Court for the southern district of West Virginia, a temporary restraining order which prohibits international and district officers and members of the United Mine Workers from organizing or attempting to organize the employees of the two companies or from interfering with such employees while at work.

No Indications of Early Settlement in Crow's Nest Pass; Company Stands Pat

THE situation in the Crow's Nest Pass coal field remains unchanged. There are no indications that an early settlement of the strike will be affected. Although the Conciliation Board is at work it would appear from reports that little progress is being made toward arriving at a basis for settlement. Meanwhile the men seem to be finding employment elsewhere and the company does not seem to be disposed to make any concessions.

W. R. Wilson, president of the Crow's Nest Pass Coal Co., in giving evidence before the board stated that since 1903 his company had lost through strike and lockouts $3,429,045. He stated further that his company had paid an average yearly return of only 2.46 per cent since 1910 on its investment of $6,200,000. In 1921 his company paid contract miners an average of $9,13 per day and day miners an average of $7.75, the former being an increase of 125.5 and the latter of 152.5 per cent compared with the wage rate of 1910.

Dissolution Decree Is Modified to Sever Relations of Reading Subsidiaries

ACTING on appeals of minority stockholders, the U. S. Supreme Court, in a decision delivered May 29 by Chief Justice Taft, ordered modifications in the decree in the Reading case designed to sever completely the relations between the Reading Railway Co., the Reading Company and the Reading Coal & Iron Co. The U. S. District Court for the southern district of New York was ordered to hear all interested parties and to take such steps as are necessary to break up completely the monopoly alleged by the court to exist. The court permanently enjoins any relations between the companies, authorizes the Attorney General and his successors to watch closely the relations between the companies and announces that it will retain a large control over the decree with power to assure its continued efficacy by summary remedy of contempt. "With these restrictive provisions and modifications of the plan the court thinks the independence of the four companies will be fully achieved," said Justice Taft.

All stockholders of the coal company, upon receiving and registering their stock in the new coal company authorized under the decree, are required to make affidavit that they have no stock ownership in the Reading Company, and are not acting or representing anyone who is. The merged Reading Company is required to register transfers of shares of its stock in the names only of persons who make affidavit that they are not stockholders, registered or actual, in either the new or old coal company. The Reading Company is perpetually enjoined from acquiring, holding or voting or in any manner acting as owner of any shares of the new coal company. The new coal company and all persons acting for it are enjoined from acquiring or voting any stock of the Reading Company.

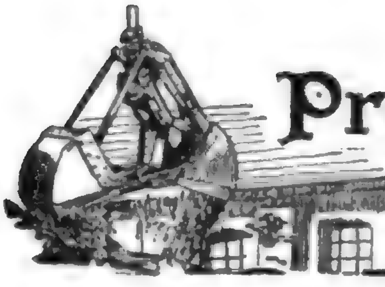
476,400 Tons of River Coal Reclaimed in Anthracite Field During 1921

A TOTAL of 476,400 tons of river coal, having a value of $697,200, was reclaimed from the rivers and streams of Pennsylvania passing through the hard coal fields in 1921, according to a summary of the river coal industry recently made public by Secretary of Internal Affairs James F. Woodward.

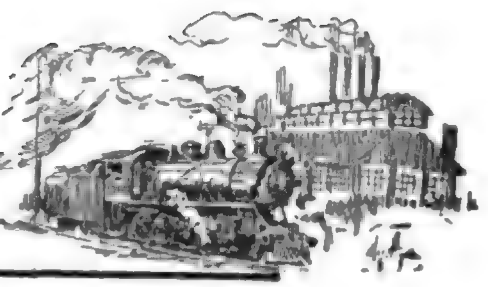
Coal was reclaimed from the Susquehanna, Schuylkill and Lehigh rivers in Berks, Columbia, Dauphin, Luzerne, Montour, Northumberland and Schuylkill counties.

There were 49 concerns engaged in reclaiming coal from streams and these gave employment during the year to 338 persons. The wages of the employees totaled $250,000. The capital invested in the industry amounted to $954,600.

In 1920 there were 551,100 tons of coal reclaimed, which had a value of $844,700.



Production and the Market



Weekly Review

WITH non-union production rising and the freight reduction in sight consumers are reluctant to purchase any coal except for emergency needs and prices have dropped still further below the level set by Mr. Hoover last week as representing a figure within reason for all concerned. *Coal Age* Index of spot bituminous prices stands at 255 on June 5, a drop of 14 points as compared with 269 on May 29.

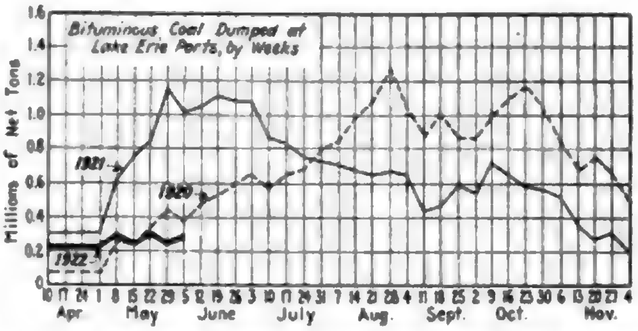
Buyers' price views are very definite and dictate current sales in nearly every instance. The purchaser of fuel has found that a withdrawal from competitive bidding has lowered spot quotations, and with the prospect of a real shortage remote is reluctant to buy.

SECRETARY HOOVER FIXES FAIR MAXIMUM PRICES

Following a consultation of operators and Secretary Hoover in Washington, May 31, the Secretary announced that $3.50 was considered a fair maximum spot price for mine run coal from southern West Virginia, Virginia, eastern Kentucky and Tennessee. Alabama prices were considered fair at $2.20@$2.60, this being 25c. under the Garfield price, the same differential to exist on other coal mined in that state.

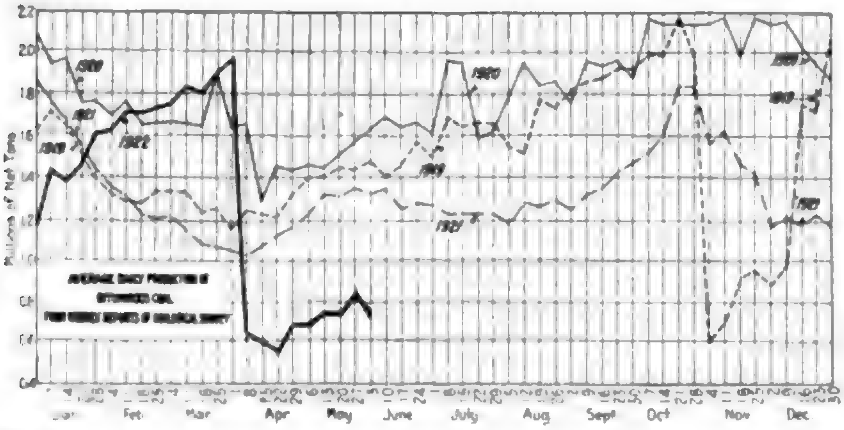
Western Kentucky prices were not announced as the conferees were unable to agree as to what would constitute a fair price. To the $4.25 price asked by the operators Mr. Hoover could not agree. Connellsville and other Pennsylvania coal operators want a maximum price of $4.50 per ton; the additional dollar above the fixed price for other regions being needed to defray the cost of mine guards during the strike, and also to compensate for short running time. They are meeting with Secretary Hoover this week to discuss price fixing for this region. In announcing the mine prices for the various sections Mr. Hoover states that "the operators absorb in these prices a reasonable selling expense."

Quotations on West Virginia steam coals show weakness in all markets. Domestic is held firmly, but in some cases industrial fuels are down to $2.50, a full dollar under the Hoover figure. Southern coals are piling up at the Roads and the majority of the coastwise business is confined to contract. New England presents a sluggish market outlook for June, for, as in other sections, buyers feel that lower freights are well worth waiting for. Prices are firmer in the Midwest region, where western Kentucky stands as the shining exception to the other fields, with prices well up to $3.50, as compared with her slump to less than $3.10 late in May. The new railroad buying pool is trimming quotations at every opportunity and is causing much resentment among the coal trade by even canceling orders to get the benefit of a lower price.



In the North Atlantic centers, such as Philadelphia, Baltimore and New York, receipts are gaining over current demand. Southern coals, by water, have been quoted lower but the violent price drop of two weeks ago has been checked. Pennsylvania coals, at this writing excluded from Mr. Hoover's "price list," are advancing again, although they are not easily sold when the quotation passes the $3.50-mark

The Northwestern market is picking up. Industry is improving and the crop outlook is better. In addition there is a growing tendency to store coal away, as dock supplies are dwindling and replacements may



Estimates of Production

(Net Tons)

BITUMINOUS		
Week ended:	1922	1921
May 13 (b)	4,433,000	8,009,000
May 20 (b)	4,484,000	7,989,000
May 27 (a)	4,856,000	8,166,000
Daily average	809,000	1,361,000
Calendar year	162,468,000	158,706,000
Daily av. cal. yr.	1,305,000	1,275,000
ANTHRACITE		
May 13	7,000	1,938,000
May 20	8,000	1,794,000
May 27 (a)	9,000	1,988,000
COKE		
May 20 (b)	101,000	72,000
May 27 (a)	101,000	68,000
Calendar year	2,696,000	3,128,000

(a) Subject to revision. (b) Revised from last report.

be slow. The Army Engineers' May report of "Soo" traffic shows no eastbound movement of coal, indicating that the recent cargoes loaded at the Head-of-the-lakes were not for Michigan ports but went to Canadian destinations. During May only 2,100 tons of anthracite passed up the "Soo" canals, while the bituminous coal movement was 202,978 tons.

BITUMINOUS

"The ninth week of the coal strike (May 29-June 3) will show a decrease in production, largely because of the observance of Memorial Day," says the Geological Survey. "The returns so far received point to an output of between 4,550,000 and 4,750,000 tons. Production of anthracite remains practically zero.

"For the eighth week returns indicate an output of 4,856,000 tons of bituminous coal and 10,000 tons of anthracite, a total of 4,866,000 tons. It is significant that the cumulative production of coal, anthracite and bituminous, since the strike began is now some 30,000,000 short of what was produced during the corresponding period of the great strike of 1919. The difference is due to the fact that in the earlier strike the anthracite miners were not called out and that even the bituminous miners were back at work by the seventh week.

"Loadings on Monday of last week were 15,082 cars, the largest for any Monday since the strike began. On Tuesday, however, because of the Memorial Day holiday, observed in many localities, loadings dropped to 11,142 cars. They recovered promptly on Wednesday, only to decline again on Thursday, partly because of the occurrence of pay day. It therefore seems probable that the total output for the week will fall considerably short of that in the week preceding.

	1st Week	4th Week	5th Week	6th Week	7th Week	8th Week	9th Week
Monday	11,445	12,131	11,598	13,118	13,366	14,772	15,082
Tuesday	11,019	12,377	12,160	13,266	12,830	15,085	11,142
Wednesday	11,437	12,622	12,861	13,445	13,422	14,677	15,097
Thursday	11,090	12,981	12,487	13,266	13,445	14,573	13,823
Friday	11,296	12,362	12,778	13,727	14,036	15,202	
Saturday	8,888	11,293	11,265	11,454	12,357	12,662	

"In the eighth week of the strike the daily average number of unconsigned loads of bituminous coal was 7,673. This figure includes all unbilled coal held by all of the carriers. The total is now less than one-fourth of that in the week of April 8."

Hampton Roads dumpings for all accounts were 393,062 net tons during the week ended June 1, as compared with 328,030 tons in the previous week. Accumulations at the piers are piling up and prices are softer as consumers hold back to await the outcome of the price conference. The present price at the Roads is 75c. under Mr. Hoover's figure of $3.50. Coastwise freights are easy and there are enough surplus bottoms available to keep these rates at a minimum.

Lake dumpings were 277,360 net tons during the week ended June 5—268,621 tons cargo and 8,739 tons vessel fuel—as compared with 249,866 tons in the preceding week. Movement for the season to date now stands at 2,233,286 tons, as compared with 5,829,935 tons for the corresponding period of last year.

All-rail movement to New England increased sharply during the week ended May 27, 1922, when 965 cars of bituminous coal were forwarded, as compared with 496

How the Coal Fields Are Working

Percentage of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan 1 to Apr. 1, 1922 inclusive	Apr. 3 to May 20, 1922 inclusive	Week Ended May 20
U. S. total	45.6	55.7	....	....
Non-Union				
Alabama	63.5	64.6	72.7	77.7
Somerset County	55.5	74.9	52.5	18.5
Panhandle, W. Va	55.3	51.3	38.5	45.5
Westmoreland	54.9	58.8	79.5	77.3
Virginia	54.8	59.9	74.8	83.3
Harlan	53.3	54.8	48.6	60.5
Hazard	51.7	58.4	57.6	55.8
Pocahontas	49.8	60.0	74.9	80.1
Tug River	48.1	63.7	79.8	89.4
Logan	47.6	61.1	74.9	79.6
Cumberland-Piedmont	46.6	50.6	13.8	18.8
Winding Gulf	45.7	64.3	71.8	75.4
Kenova-Thacker	38.2	54.3	77.5	86.7
N. E. Kentucky	32.9	47.7	58.4	60.1
New River‡	24.3	37.9	12.0	29.1
Union				
Oklahoma	63.9	59.6	14.8	9.0
Iowa	57.4	78.4	0.0	0.0
Ohio, Eastern	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	0.3	1.0
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	10.7	11.0
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	11.3	10.6
Fairmont	35.3	44.0	4.6	6.2
Western Kentucky	32.5	37.7	50.7	79.1
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	1.8	2.5
Ohio, Southern	22.9	24.3	0.0	0.0

*Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

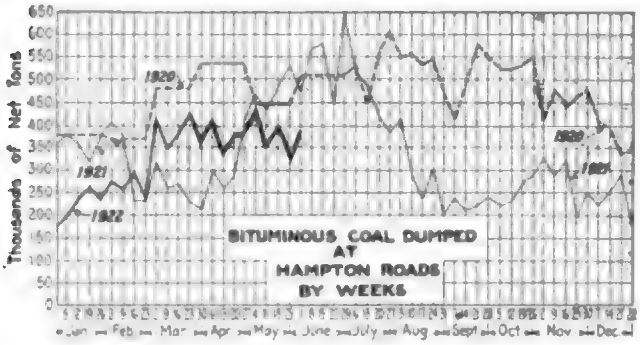
Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

	Market Quoted	May 8 1922	May 22 1922	May 29 1922	June 5 1922†
Low-Volatile, Eastern					
Smokeless lump	Columbus	$2 85	$3 65	$3 55	*$3 25@ $3 50*
Smokeless mine run	Columbus	2 40	3 30	3 40	*2 75@ 3 25*
Smokeless screenings	Columbus	2 20	3 25	3 25	*2 50@ 3 00*
Smokeless lump	Chicago	2 90	2 75	3 40	*3 00@ 3 25*
Smokeless mine run	Chicago	2 25	2 75	3 15	*2 50@ 2 75*
Smokeless lump	Cincinnati	2 90	3 50	3 40	3 25@ 3 50
Smokeless mine run	Cincinnati	2 60	3 25	3 15	*2 75@ 3 00*
Smokeless screenings	Cincinnati	2 40	3 15	3 00	*2 75*
*Smokeless mine run	Boston	5 65	7 35	6 15	*6 00@ 6 25*
Clearfield mine run	Boston	3 15	3 75	3 15	**3 00@ 3 40**
Cambria mine run	Boston	3 50	4 25	3 65	3 50@ 3 75
Somerset mine run	Boston	3 40	3 65	3 40	*2 90@ [illegible]*
Pool 1 (Navy Standard)	New York	3 75			**4 00@ 4 75**
Pool 1 (Navy Standard)	Philadelphia	3 75	4 75		....
Pool 1 (Navy Standard)	Baltimore	3 90			
Pool 9 (Super. Low Vol.)	New York	3 50		3 80	**3 75@ 4 00**
Pool 9 (Super. Low Vol.)	Philadelphia	3 40	4 65	3 60	**3 75@ 4 00**
Pool 9 (Super. Low Vol.)	Baltimore	3 40	4 75	3 25	**3 25@ 3 50**
Pool 10 (H. Gr. Low Vol.)	New York	3 25	4 90	3 60	**3 65@ 3 80**
Pool 10 (H. Gr. Low Vol.)	Philadelphia	3 20	4 75	3 25	**3 40@ 4 00**
Pool 10 (H. Gr. Low Vol.)	Baltimore	3 25	4 75	3 25	**3 25@ 3 40**
Pool 11 (Low Vol.)	New York	3 00	4 65	3 25	**3 50@ 3 70**
Pool 11 (Low Vol.)	Philadelphia	2 85		2 75	**3 00@ 3 50**
Pool 11 (Low Vol.)	Baltimore	3 20	4 75	3 05	**3 00@ 3 25**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	2 70		3 [illegible]	**3 50@ 3 75**
Pool 54-64 (Gas and St.)	Philadelphia	2 65	3 40	2 75	
Pool 54-64 (Gas and St.)	Baltimore	3 00	4 00	3 00	**3 00@ 3 45**
Kanawha lump	Columbus	3 15	3 60	3 45	[illegible]
Kanawha mine run	Columbus	2 65	3 25	3 25	[illegible]
Kanawha screenings	Columbus	2 20	3 35	3 10	[illegible]
W. Va. Splint lump	Cincinnati	2 50	3 40	3 40	[illegible]
W. Va. Gas lump	Cincinnati	2 90	3 65	3 30	[illegible]
W. Va. mine run	Cincinnati	2 70	3 40	3 10	[illegible]
W. Va. screenings	Cincinnati	2 50	3 25	3 10	[illegible]
Hocking lump	Columbus	3 15	3 90	3 60	[illegible]
Hocking mine run	Columbus	2 90	3 65	3 55	[illegible]
Hocking screenings	Columbus	2 25	3 50	3 55	*2 75@ 3 00*
Pitts. No. 8 lump	Cleveland	3 25	3 90		
Pitts. No. 8 mine run	Cleveland	$3 00	$3 90	$3 25	....
Pitts. No. 8 screenings	Cleveland	3 00	3 90	3 25	....
Midwest					
Franklin, Ill. lump	Chicago	3 45			..
Franklin, Ill. mine run	Chicago	3 00			
Franklin, Ill. screenings	Chicago	3 00			
Central, Ill. lump	Chicago	2 75			
Central, Ill. mine run	Chicago	2 75			
Central, Ill. screenings	Chicago	2 00			
Ind. 4th Vein lump	Chicago	3 15			
Ind. 4th Vein mine run	Chicago	2 50			
Ind. 4th Vein screenings	Chicago	2 25			
Ind. 5th Vein lump	Chicago	2 60			
Ind. 5th Vein mine run	Chicago	2 60			
Ind. 5th Vein screenings	Chicago	2 40			...
West. Ky. lump	Louisville	2 90	3 25	3 20	**3 20@ 3 40**
West. Ky. mine run	Louisville	2 65	3 25	3 20	**3 20@ 3 40**
West. Ky. screenings	Louisville	2 65	3 25	3 20	**3 20@ 3 40**
West Ky. lump	Chicago		3 60	3 10	**3 25@ 3 50**
West Ky. mine run	Chicago		3 60	3 10	**3 25@ 3 50**
South and Southwest					
Big Seam lump	Birmingham	2 00	2 00	2 00	**2 15@ 2 25**
Big Seam mine run	Birmingham	1 70	1 70	1 70	1 50@ 1 90
Big Seam (washed)	Birmingham	2 15	1 85	1 85	1 75@ 2 00
S. E. Ky. lump	Chicago	....	3 65	3 10	3 00@ 3 25
S. E. Ky. mine run	Chicago		3 50	3 10	3 00@ 3 25
S. E. Ky. lump	Louisville	2 90	3 90	3 10	*2 50@ 3 25*
S. E. Ky. mine run	Louisville	2 80	3 40	3 10	*2 50@ 3 25*
S. E. Ky. screenings	Louisville	2 60	3 40	3 10	*2 50@ 3 25*
S. E. Ky. lump	Cincinnati	2 60	3 50	3 30	*3 00@ 3 50*
S. E. Ky. mine run	Cincinnati	2 60	3 50	3 15	*2 65@ 3 00*
S. E. Ky. screenings	Cincinnati	2 50	3 25	3 15	*2 50@ 3 00*
Kansas lump	Kansas City	4 25	4 25	4 25	4 00@ 4 50
Kansas mine run	Kansas City	4 15	4 15	4 20	4 00@ 4 40
Kansas screenings	Kansas City	2 65	2 65	2 75	2 60@ 2 85

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in heavy type, declines in *italics*.
NOTE—Smokeless prices now include New River and Pocahontas.

in the preceding week. The increase is only temporary, however, as New England is not in the market for coal at the present quotations from the Pennsylvania fields. The movement is confined almost entirely to contract fuel, most of it for railroad use.

Alabama producers are benefiting from an influx of "foreign" coal orders from markets normally supplied by other fields now closed. This has resulted in heavier operations, but with the exception of domestic coal, prices have not advanced. Alabama coal men were the first to accept Mr. Hoover's price ideas and quoted their product at 25c. under the Garfield price.

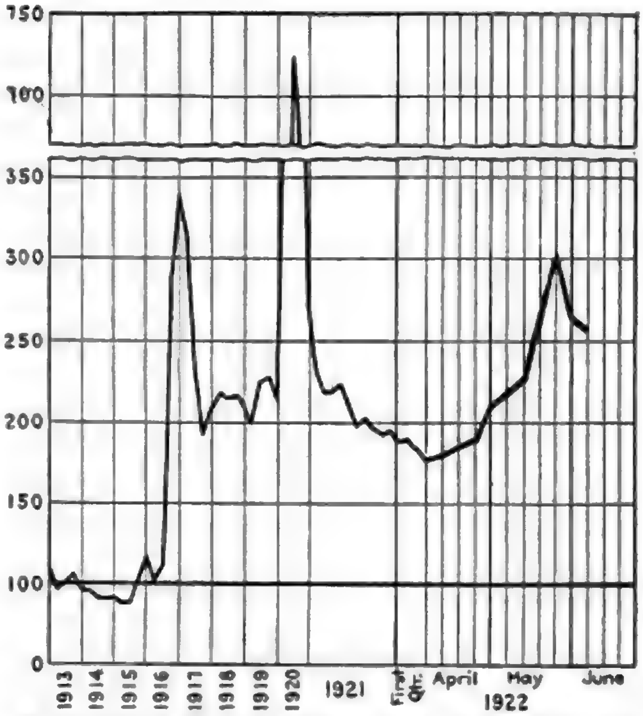


ANTHRACITE

No fresh-mined coal is being produced. The 184 cars loaded during the week ended May 27 were steam sizes dredged from the rivers. Against a weekly output of 1,988,000 net tons a year ago, present production is less than 10,000 tons. Coal continues to go forward from the storage yards of the producers, and it is this ex-storage coal which supplies most of the tonnage moving. The number of unbilled loads for the week ended May 27 averaged 1,168 cars. Domestic demand at retail is at a standstill. In the steam trade, buckwheat No. 1 is coming into active demand, being the only steam size available, except for the coals now being dredged from the rivers.

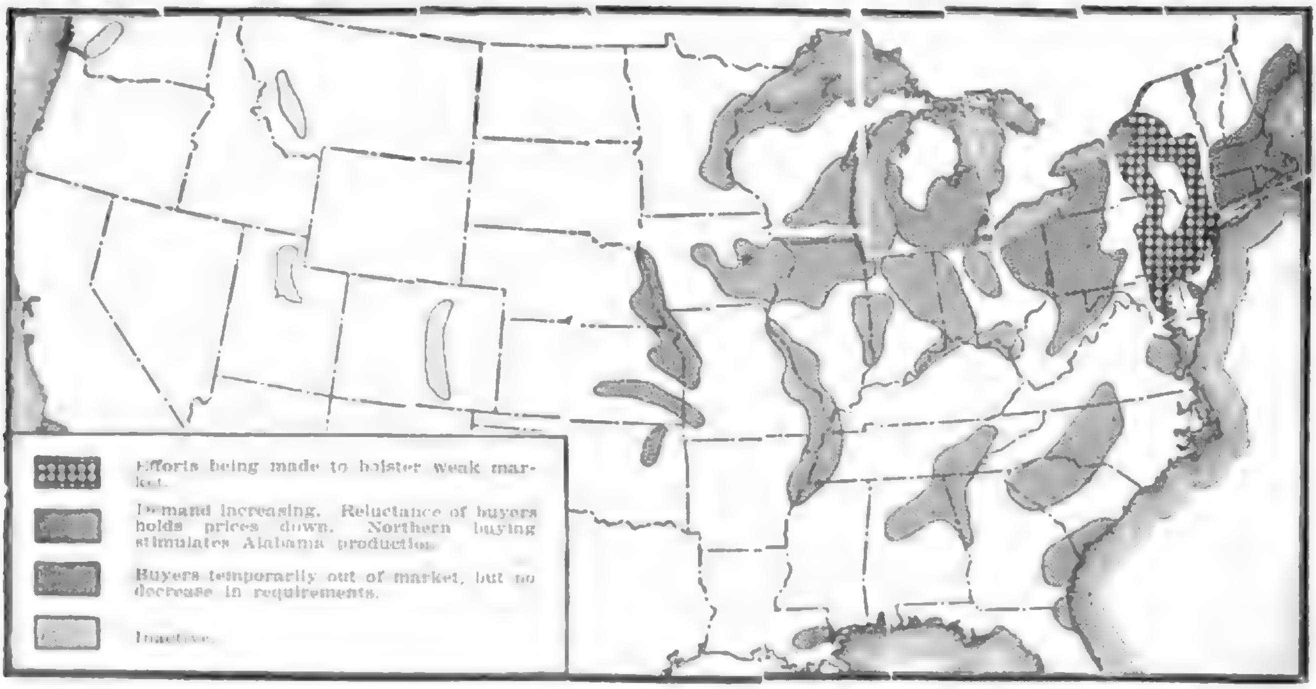
COKE

Beehive coke production was 101,000 net tons during the week ended May 27, unchanged from the preceding week's output. Production in the Connellsville region was slightly increased during the week. Coke offerings are very light and although spot quotations are too high for most users, there are enough buyers in the coke market to sustain them. The market has been strengthened also by recent buying by some Eastern furnaces. Connellsville coal, while not included in Hoover's price views last week, was selling under the $3.50 figure set for other non-union fields.



Coal Age Index 255, Week of June 5, 1922. Average spot price for same period $3.08. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh District, Illinois, Indiana and Pitts. No. 8 prices not included in figures for last week.)

Relative Activity of Markets for Bituminous Coal at End of Ninth Week of Strike


Efforts being made to bolster weak market.
Demand increasing. Reluctance of buyers holds prices down. Northern buying stimulates Alabama production.
Buyers temporarily out of market, but no decrease in requirements.
Inactive.

Foreign Market And Export News

British Export Market Less Active

Production in Great Britain for the week ended May 20 was 4,804,000 gross tons, according to a cable to *Coal Age*, as compared with 4,945,000 tons in the preceding week. The East coast markets are softening and with sales declining and offerings increasing, lower prices are being quoted. The South Wales Coal Owners' Association has called a meeting to discuss a future policy, fearing that unless definite action is taken, prices will drop below production costs.

During April, 1,326,471 tons of bunker coal were shipped for the use of steamers engaged in the foreign trade, as compared with 661,800 tons in the corresponding month last year. During the first four months of 1922, 5,729,733 tons were shipped.

South American demand for Welsh coal has revived considerably and there are indications that supplies to that quarter will soon reach pre-war figures.

The resumption of work in the British shipyards has had a very favorable influence on the north British coal fields, notably, Northumberland and Durham. Export business includes an increasing demand from Germany. The Soviet Government of Russia has also contracted for 260,000 tons for four months at the rate of 65,000 tons per month. A Stockholm gasworks has taken 40,000 tons of Durham coking coals and 10,000 tons of Durham gas coals. Gefle gasworks has also asked for 4,000 tons of special Durham gas coals for shipment during the next three months. British merchants are interested in the Brazilian Government's call for tenders for 150,000 tons of steam coal for the Central Railway.

The English and Welsh Railways have reduced the transport charges on coal, coke and patent fuel as follows: Flat rate further reduced from 4d. to 3d. per ton; maximum addition reduced from 4s. to 3s. 6d. per ton. Where the 3s. rate is now applicable it will be retained.

Prices Soft at Hampton Roads

Dumpings were on the increase last week. The Norfolk & Western Piers broke the world's dumping record, having sent down the chutes over 52,000 tons of coal in 19 hours and 10 minutes, and for May dumped 817,000 tons, out of a total of 1,542,000 tons for all piers.

While dumpings were on the increase, stocks moved were mostly on contract, very little new business having come into the market. Dealers attributed this to the attitude of "watchful waiting" on the part of consumers who are holding back for the outcome of the Hoover conference.

Movement to New York was holding its own, while New England shipments were falling off. Prices dropped again during the week. Dealers were confident of an increase in business during the next two weeks, when consumers' stocks, not having been recently replenished, are exhausted.

United States April Exports, by Customs Districts

Customs Districts	Gross Tons Bituminous	Gross Tons Anthracite
Vermont	780	216
St. Lawrence	138,217	53,079
Rochester	11,476	1,544
Buffalo	117,221	49,270
New York	115	3,414
Philadelphia	10,602	702
Maryland	14,141	..
Virginia	212,527	......
S. Carolina	19,836	......
Florida	14,112	......
Mobile	467	......
New Orleans	868	50
San Antonio	39	323
El Paso	5,224	113
San Diego	33	......
Arizona	1,220	......
San Francisco	54	2
Washington	407	......
Alaska	141	......
Dakota	3,016	172
Duluth and Superior	6,518	27
Michigan	72,780	375
Ohio	85,201	3
Total	714,995	109,290

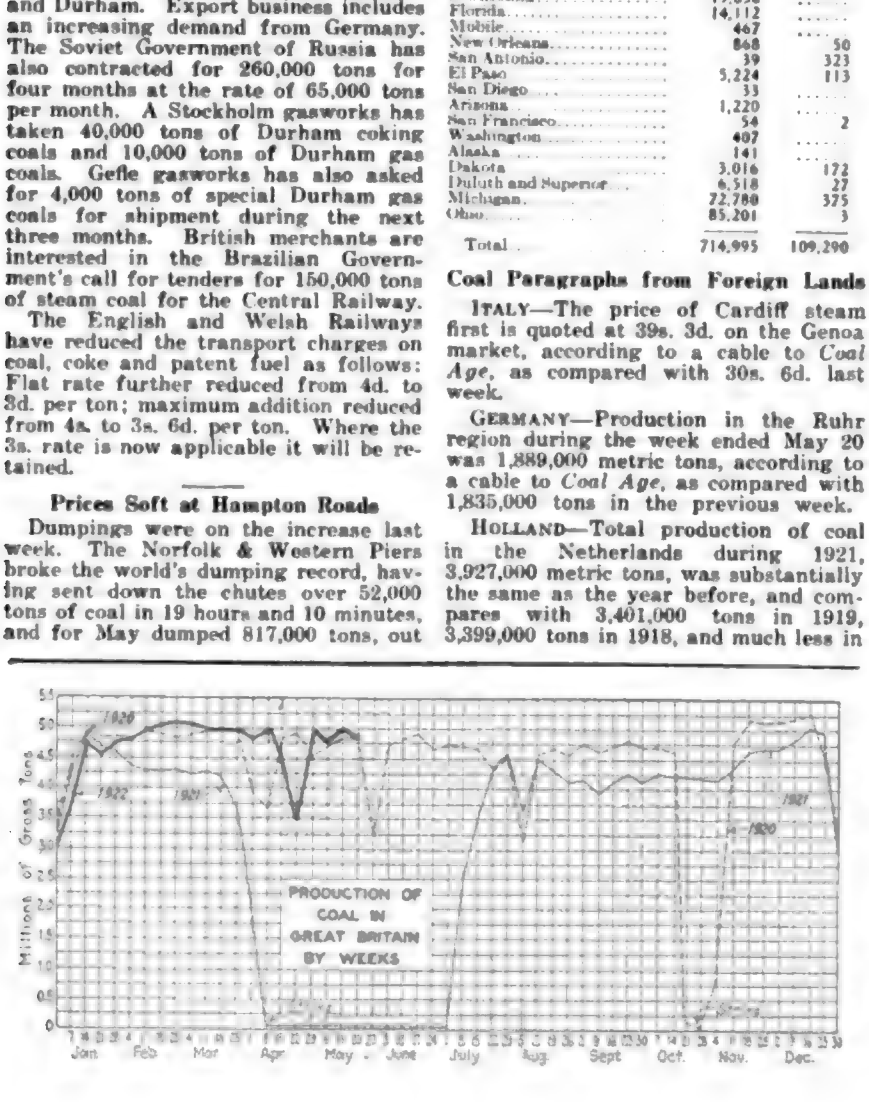
Coal Paragraphs from Foreign Lands

ITALY—The price of Cardiff steam first is quoted at 39s. 3d. on the Genoa market, according to a cable to *Coal Age*, as compared with 30s. 6d. last week.

GERMANY—Production in the Ruhr region during the week ended May 20 was 1,889,000 metric tons, according to a cable to *Coal Age*, as compared with 1,835,000 tons in the previous week.

HOLLAND—Total production of coal in the Netherlands during 1921, 3,927,000 metric tons, was substantially the same as the year before, and compares with 3,401,000 tons in 1919, 3,399,000 tons in 1918, and much less in previous years. The coal supply for 1921 amounted to approximately 8,625,000 tons, as compared with 7,620,000 tons in 1920 and 7,554,000 tons in 1919.

BELGIUM — No important changes have taken place on the market, although business is slightly more active and there is a better demand for certain industrial fuels. The entire coke production is easily sold and there is even a certain delay in delivery. Switzerland and Holland continue to lay in stocks of anthracite. The Grand Duchy of Luxembourg and Alsace-Lorraine are buying large quantities of metallurgical coke.



Hampton Roads Pier Situation

	Week Ended May 25	Week Ended June 1
N. & W. Piers, Lamberts Point:		
Cars on hand	3,242	3,677
Tons on hand	163,195	195,892
Tons dumped	149,582	200,979
Tonnage waiting	30,000	59,600
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,667	1,711
Tons on hand	83,350	85,550
Tons dumped	84,488	92,101
Tonnage waiting	[illegible].250	20,909
C. & O. Piers, Newport News		
Cars on hand	1,454	911
Tons on hand	72,700	67,500
Tons dumped	56,814	57,869
Tonnage waiting	7,915	3,300

Export Clearances, Week Ended, June 1, 1922

FROM HAMPTON ROADS:

For Atlantic Islands:	Tons
Nor. S.S. Gran, for Barbados	2,976
Dan. S.S. Normannia, for Curacao	3,723
Nor. S.S. Wagland, for Kingston	3,071
Amer. Schr. Cynthia J. Griffin, for St. Stephens	588
Nor. S.S. Fram for Port au Spain	3,061
For Cuba:	
Am. Schr. Friendship, for Banes	1,004

FROM PHILADELPHIA:

For Atlantic Islands:
S.S. Carib, for San Juan ....
For Cuba:
Dan. S.S. Phonix, for Havana ....

Pier and Bunker Prices, Gross Tons

PIERS

	May 27	June 3†
Pool 9, New York	$7.25@$7.50	$7.00@$7.25
Pool 10, New York	7.00@7.25	6.60@7.00
Pool 9, Philadelphia	6.75@7.00	**7.25@7.50**
Pool 10, Philadelphia	6.50@6.75	**7.00@7.25**
Pool 71, Philadelphia	7.00@7.25	**7.50**
Pool 1, Hamp. Rds	6.00@6.25	*6.00@6.10*
Pools 5-6-7 Hamp. Rds	6.00@6.50	*5.80@6.00*
Pool 2, Hamp. Rds	6.00@6.20	*5.60@5.80*

BUNKERS

	May 27	June 3†
Pool 9, New York	$7.60@$7.80	*$7.30@$7.55*
Pool 10, New York	7.15@7.55	*6.90@7.25*
Pool 9, Philadelphia	7.05@7.35	**7.60@7.85**
Pool 10, Philadelphia	6.80@7.00	**7.00@7.25**
Pool 1, Hamp. Rds	6.25@6.[illegible]	*5.75*
Pool 2, Hamp. Rds	6.25@6.50	*5.75*
Welsh, Gibraltar	43s. f.o.b.	43s. f.o.b.
Welsh, Rio de Janeiro	57s. 6d. f.o.b	57s. 6d. f.o.b.
Welsh, Lisbon	43s. f.o.b.	43s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	43s. t.i.b.	43s. t.i.b.
Welsh, Messina	41s. f.o.b.	41s. f.o.b.
Welsh, Algiers	41s. f.o.b.	41s. f.o.b.
Welsh, Pernambuco	65s. f.o.b.	65s. f.o.b.
Welsh, Bahia	65s. f.o.b	65s. f.o.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Malta	44s. 6d. f.o.b.	44s. 6d. f.o.b.
Welsh, Las Palmas	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Port Said	51s. 6d. f.o.b	51s. 6d. f.o.b.
Alexandria	43s.	43s.
Capetown	35s. 3d.	35s. 3d.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	May 27	June 3†
Admiralty, Large	27s. 9d.@28s.	*27s. 6d.@27s. 3d.*
Steam, Smalls	18s. 6d.@19s.	18s. 6d.@19s.
Newcastle:		
Best Steams	23s. 6d.@24s.	*23s.*
Best Gas	23s. 6d.	*22s. 6d.*
Best Bunkers	22s. 6d.@23s.	*21s.@22s.*

†Advances over previous week shown in **heavy type**; declines in *italics*.

North Atlantic

Prices Strengthen Gradually Following Violent Decline

Buyers Retiring in View of Price Conference and Freight Cut—Moderate Consumer Shops Cautiously—Emergency Orders Prevent Sag in Spot Quotations—Production Gains Slowly.

BETWEEN the Washington conference and the freight drop buyers have become more reticent. The withdrawal of demand, however, which caused a violent decline in prices ten days ago, has been followed by a gradual upbuilding of the price market. The moderate consumer is still wary and will not buy unless he gets his price, but there are evidently enough emergency orders available to temporarily bolster spot quotations and Pennsylvania coals are ranging $3.50@$4.50, depending on quality.

Production is increasing slowly, some defections in the union ranks being noted in the Clearfield section. Southern coals in heavy volume are a factor in holding all prices from a more rapid advance.

PHILADELPHIA

The violent drop in prices of a week ago has been considerably checked and such coal as can be had is once more hovering around $4. The moderate consumer is still staying out of the market, feeling certain that he will save much money by doing so, yet the hopes of some are likely to be blasted, as many are expecting a price close to $2.

The matter of a fixed price naturally is causing much comment in the trade, and at this time it appears that if a standard is set there will really be no spot market, at least in a sense, as it would not be necessary for a producer to job his product around.

Some consumers recently have been approached for business on a contract basis, there being some producers who are willing to enter into a contract beginning at such a time as the strike is settled. To the mass of consumers this seems somewhat odd, yet when it is considered that some good coal has been offered on a basis of $2.50 it would appear not to be so bad after all. The interests talking contract are evidently figuring that with the strike over there will be plenty of spot coal even under the above figure and will be glad to have a proportion of their tonnage tied up at that price.

BALTIMORE

The price is now hitting on maximum under the Hoover arrangement. The individual agreement idea as formulated in Washington led as a first effect to a sudden release of considerable coal which had been held apparently with the idea of getting $4 and better. This sudden release, along with the fact that the public was not demanding fuel in quantity, led to a drop of even high-grade coals to the $3 mark for a time.

For several days, however, there has been a gradual upbuilding of the price market. At this writing even the poorer grades are worth $3@$3.25, the better grades striking the maximum of $3.50.

One of the curious twists of the price-fixing idea is that Pocahontas and New River are being held generally around the maximum price, whereas even in the recent spurt which carried some of the coals close to $5, it was not difficult to get Navy Standard at Hampton Roads on a mine basis of $3@$3.25.

The export situation remains utterly at a standstill. Nearly two months have gone by without a single shipment of cargo coal to a foreign port from Baltimore. There is some difference of opinion in the trade as to whether American coals will again get actively into the foreign market this summer.

NEW YORK

Between conferences at Washington and the freight rate reduction order the few buyers in the field have apparently retired to await developments. Demand has taken a further slump but quotations are firmly held and show no softening tendency.

Coal which had been ordered a couple of weeks back when prices were higher reached Tidewater and remained there because of the refusal of the prospective purchasers to take it at the figures they were quoted at the time. They also added the Hoover conferences and the change in freight rates to their refusal reasons. There were about 2,000 cars at the docks at the end of the week.

The lack of activity in Pennsylvania coals available here was attributed in part to the Southern coals which have been offered in some instances at less than the quotations for the better grades of Pennsylvania product.

UPPER POTOMAC

Further improvement is observed both in the Upper Potomac and Georges Creek fields. Upper Potomac production, as a result of a resumption of operations at additional mines, is now about 20,000 tons a week. There continues to be a strong demand although further advances in price had been checked owing to more conservative buying and the prospect of an agreement on prices.

FAIRMONT

Although there has been more or less violence on the part of striking miners in connection with the efforts of operators to resume mining, nevertheless mine-owners have succeeded in a number of instances in getting back on a working basis. Approximately 137 mines are now in operation, producing about 40 per cent of the normal tonnage of this section. Although prices have declined as a result of the price limitation talk, the drop has not been such as to debar smaller mines from operating.

CENTRAL PENNSYLVANIA

With the return of more miners, production has shown a steady increase until loadings now are well over 600 cars per day. For the first time since the strike was declared miners have deserted the union and gone back to work on the 1917 scale.

At one operation in Clearfield County, 200 miners returned to work. Money to pay the check-weighmen will be collected by the operating companies but there will be no checkoff payments. In the Colver and Ebensburg sections, evicted families are living in tents provided by the union.

West

KANSAS CITY

Little or no interest seems to be taken in the coal strike. So far no one has had to close down and some of the larger plants have two month's supply of coal on hand and none of them are out. Besides, a number of retail yards are full of coal of all grades. Some of the public utilities have enough coal in storage to last them until October, and if the mines were to start up tomorrow they would have a hard time to place a quarter of their potential capacity production. It is also true that smaller plants are getting short of coal but the little that is being produced in Arkansas, Kansas and Missouri, is ample to take care of all the requirements.

Summing the situation up, about the only one that is not worrying is the consumer of coal. No material change in prices has appeared.

DENVER

Freight reductions for July 1 will result in an unusual increase in the summer domestic coal trade and possibly lower prices, according to many of the large operators of the state. There will be a reduction of 26c. a ton in the rate from the Canon City district to Denver and 13½c. from the Walsenburg district. On shipments into western Kansas the maximum cut will amount to 60c.

In spite of the nationwide strike operators say Colorado mines have been producing more coal than was necessary to supply the demand. Many of them prophesy a drop in price soon. Retailers are holding off in anticipation of this.

SALT LAKE CITY

Operators report that the industries and railroads are furnishing about the only market for coal now, but they are not storing much, if any. The Coast trade has shown no signs of improvement so far. It is expected to come with a rush as soon as the I. C. C. approves the new rate filed by the carriers. Dealers are trying to get their customers to put in coal for the winter and many circulars have been sent through the mail of late. Prices remain the same and are not likely to change without a decrease in the intrastate rates.

Anthracite

Market Still Inert; Dealers Indifferent as Stocks Melt

Consumers Warned of Rush When Coal Is Available—Shrinkage of Storage Piles Quickens Demand for Steam Coals Dredged from Rivers.

RETAIL stocks are running low but there is little buying activity shown. The consumer continues his indifferent attitude, except for an occasional inquiry of his dealer as to the outlook for his winter's supply. Retailers are not urging purchases, although warning their customers of an inevitable rush to come when coal is again available. In the meantime, dealers are content to fill what few orders come their way, knowing that they are certain to clean up their old stocks before they have to replace with a new-cost fuel.

Storage piles of domestic coals are reduced to pea while buckwheat No. 1 is about all that is available in the steam line. This is enhancing the market for steam coals dredged from the rivers, which is the only coal now being produced.

BUFFALO

Demand was never so small. As a rule the shippers have some coal of certain sizes, but the call for it is so small that it is a certainty that the consumer is in no way disturbed by the outlook.

Independent anthracite is now said to be all gone. Jobbers are not able to get any and they do not try to sell any schedule-company coal, so they are obliged to fall back on what little they can get out of the bituminous trade, which is little enough at the best.

The Lake situation is not much changed. Vessel owners say they are certain of a rushing fall business, for both coal and ore will be moving at capacity rates. Now it is hard to keep the fleet busy, except on bituminous business.

BOSTON

There has been a noticeable increase in retail deliveries, due doubtless to newspaper reports as interpreted by the more prudent householders. Egg is particularly in demand and from present indications the larger cities will have small supplies of stove and chestnut after egg reserves are entirely depleted.

About the only hard coal now being received is confined to small shipments of egg and chestnut, together with an occasional lot of pea. A larger number of communities are taking from the retailers a surprisingly small tonnage from week to week. Sometime the scare will start and the present relatively small stocks will be absorbed in a short period.

PHILADELPHIA

Retail trade remains at a standstill, with not a dealer in the city delivering enough coal to meet anything near the expense of keeping open. There was an offering of storage stove and nut during the week, with a number of orders placed, although the report now is that delivery will not be made, due to trouble at the mines where the coal was being run through a breaker for re-cleaning and better separation.

With the suspension two months old there is a general increase in the number of people who are inquiring of their coal dealer as to the possibility of being taken care of next fall. One dealer tells the whole story when he says "a ton order now when we have it is worth a hundred when we don't."

Storage buckwheat is now moving better than at any time since last winter. Outside trade is still paying $3.75 @$4 for this size, and sometimes $4.25. All companies receive many inquiries for rice and barley, which they cannot fill. Manufacturers are turning to some extent to river coal and the interests producing this are coming into the market and getting some trade, with every prospect of betterment.

BALTIMORE

A survey of the yards shows that the reserve is probably not greater than 5,000 tons. A curious feature of the situation is that the public is apparently not at all disturbed over the situation. However, the real underlying feeling of the public is that the strike has caused a temporary scarcity which will prevent them getting coal except at advanced rates and that there will be plenty later on. The physical possibility of delivery and distribution when everything is rushed in a few weeks does not seem to strike the average consumer.

NEW YORK

There is no real activity in the situation. With production at a standstill and their stock piles reduced to a minimum there is practically nothing larger than pea size available.

Retail dealers are moving supplies slowly. They are well stocked with certain sizes but are not urging their customers to lay in their winter coal. Those who want coal have no difficulty in getting it from certain dealers.

Most dealers with business establishments for regular customers have made arrangements to keep them supplied during the suspension, even though it means the holding up of household orders.

The public has not yet become interested enough to realize that there may be a shortage in the fall and winter, even though the mines should resume operations now. When they do the trade looks for a strong demand and a quick turn-over of what coal will be available.

Demand for steam coals is active with little rice or barley being offered. Some loaded boats of buckwheat were offered at $6.25@$6.75, alongside, and rice at about 50c. lower.

ANTHRACITE FIELDS

Sentiment seems to be growing that more and more of the miners will take a reduction of pay if that will clear up the situation. Officials of the union have indicated that the men are against the proposal of the operators to submit the wage controversy to a Presidential tribunal. Rejection of the proposal would mean a strike, bringing out the 8,000 maintenance workers now caring for the coal properties.

Members of the scale committee are on an extended survey of the field to sound out the men on this arbitration proposal. If a strike were called, the men are likely to be disappointed in the amount of strike benefits that are available.

South

BIRMINGHAM

The market is looking up a little and indications point to more active buying. In local territory there is some disposition to contract for steam coal, especially on the part of the cotton oil industry. Some coal is going into Georgia and Mississippi territory formerly supplied from east and west Kentucky. There is a more optimistic feeling in the trade and confidence that better business is not far off.

Domestic demand is rather weak, especially the medium and lower grades. Retail trade is practically at a standstill.

The railroads, aside from the Frisco, are pretty well stocked ahead and are not taking their contract quotas at present. Coal loading equipment during the past week has been somewhat short on the L. & N., Southern and Mobile & Ohio.

Quotations on steam coal are unchanged. Domestic prices for June range as follows:

	Lump and Egg
Carbon Hill	$2.15@$2.40
Black Creek	2.90@ 3.15
Cahaba	3.15@ 3.65
Corona	2.65@ 2.90
Montevallo	3.90@ 4.15

Production is now on a basis of about 300,000 tons per week. There is a good supply of both miners and company labor. Labor agencies have been busy in this field of late and quite a few men have been carried away on transportation or induced to go to other mining districts.

VIRGINIA

Production reached its highest point since late in 1920 during the latter part of May, averaging 200,000 tons a week. There was a slight loss from car shortage and a heavier loss from labor shortage, with mine disability also retarding production a little. As coal output increases coke production is dwindling. Most of the small mines are now working. The market is absorbing the entire output of the region, there being an especially strong call at Tidewater and in Eastern Inland markets.

Chicago and Midwest

Sluggish Market Week Ends with Better Tone

Trade Was Slow Throughout The Region And Distress Coal Caused Some Pain but Prices Are Firmer Now—Railroad Pool Makes Enemies.

COAL trade generally was sluggish throughout most of the past week but within the last day or two the Midwest market has "perked up" a trifle and prices have firmed. In the case of Kentucky coals on the Chicago market an upturn of about 50c. a ton was noticeable. Buying was fairly light everywhere. In the Kentucky mining fields it required real effort to sell the whole output even at the reduced prices of a few days ago. Very little other coal appeared in this region.

It is evident that most heavy consumers are going to buy a fair quantity of fuel during the next week or two—now that Mr. Hoover has managed to set a price for all but western Kentucky—and then probably rest on their oars for the remainder of the month until the new freight rates go into effect. The main struggle of the selling agencies will be to "do it now," before the anticipated lull sets in.

The heaviest buying in this part of the country has been done by the railroads' fuel committee. The committee has incurred some enmity by canceling coal it had agreed to take. But generally speaking, the pool has worked greatly to the advantage of the roads in spite of a continuing feeling of discontent on the part of some of the lines involved. The action of the pool has had a decided effect against certain kinds of speculation.

LOUISVILLE

As a result of the announcement of May 24, of reduced freight rates on July 1, coal buying has slumped, consumers laying off of stocking except for emergency use, while awaiting reduced freights, and watching outcome of Washington conferences on price regulation of non-union coals. The feeling that the strike may be broken by July is also having a tendency to hold down immediate buying.

Prices slumped off 50c.@$1 within ten days, but are firmer now. There is some railroad buying and some industrial demand, but very little lump demand from retailers. Not much heavy stocking is going on anywhere. Of course the steel and metal working industries are busy and having to buy rather steadily, while the cement and brick and clay industries and general building supply manufactures, and ice and refrigerating people are all busy.

Eastern Kentucky mines are in some instances going along at full speed, others having eased off a little this week, as there are not many buyers in the field. Inquiry is off, and orders not active. Prices show a wide range, from $2.50@$3.25 for all sizes.

Eastern Kentucky is moving tonnage principally to the Lakes and to the steel districts, with a little movement to the East.

Jobbers report better demand at Louisville this week than last, which was a quiet one. As a rule the trade feels that in spite of increased non-union production and reduced immediate demand, that the market will remain around $3@$3.50 for good coal. The present slump promises to be but temporary at best, as storage stocks have been cut into and production is not the equal of present day consumption. This means that the old law of supply and demand may control. In case the buyers hold off until after July to stock and reduce storage stocks materially, it will probably result in a grand fall rush, meaning prices as high as the present ones, if not higher.

WESTERN KENTUCKY

The past 10 days saw western Kentucky prices slump off from $3.50@$3.75, to $3.10@$3.35, partly as a result of overbuying reported in Chicago, St. Louis and Detroit, along with a general suspension of buying in view of the Washington conferences and freight rate reduction of July 1.

Producers and jobbers appear to be showing more interest in the Washington discussions, and a willingness to co-operate so far as they can, to prevent any runaway market. However, since the announcement of the future freight reduction, there will be enough coal mined and waiting probably to prevent any rapid advances. A market of $3@$3.50 a ton appears to be in prospect for all sizes.

Jobbers are scouting the fields and using long distance telephones freely in lining up coal that can be bought for resale at $3.25@$3.35 a ton. As a whole, demand is about taking care of the steady production of the field. There is a reported tendency of mine operators to take business covering a few days now instead of only a few hours.

CHICAGO

The coal market here showed distinct signs of firming up along toward the end of last week, following a few days of dropping prices and of disinterest by smugly satisfied buyers. The slump in western Kentucky to $3 ended and that coal began fighting its way back up so that a fair average quotation at the end of the week was $3.45. Eastern Kentucky, which had sagged below $3 also executed an ascent to about $3.25 while the little West Virginia fuel which penetrated the ranks of active markets between the field and this city went up to about the same level. All this happened after several hundred cars of distress coal earlier in the week had been unloaded and the yards more or less cleared out.

The railroad pool continues to cause trouble for jobbers and some others. The organization did not fix a maximum buying price and stick to it, but devoted itself to trimming the market quotation at every opportunity. In at least one case the coal committee outraged an operator by canceling a written order after some of the coal was rolling. "If that sort of thing goes on," commented a coal man, "railroads may rest assured a lot of business hatred will be laid up against them which will vent itself when more normal times arrive." A railroad fuel agent said he didn't know what the committee was doing, but if it did cancel it would only be returning tit for tat. Many an operator in the past has refused to deliver coal at an agreed price, when the market was bounding upward.

SOUTHERN ILLINOIS

With practically all the commercial coal gone that has been held in storage, except a little slack that has been on the ground for a considerable length of time, there is no activity in the Williamson and Franklin County field. A little railroad coal is still held at a couple of points. There has been no disturbance of any kind, but the miners are uneasy and at several points their guarantee has been shut off. Especially has this been true of the unmarried mine worker. This element, however, seems to be drifting away from many sections.

A little coal is still on hand in the Mt. Olive field, but this will be entirely gone in the next week or ten days. In the Standard district there are still a few thousand tons on the ground. This is being loaded out rapidly and is bringing about $4.50 for domestic sizes and $4@$4.25 for the steam coal at the mine. Quietness prevails throughout the Standard field, but the miners indicate that they are getting uneasy and are at the straining point financially.

ST. LOUIS

There is no activity locally. A little steam is being bought under emergency. The tonnage is so small that it is not a material factor in the market. Dwindling storage piles are still being called upon. Operators who held coal at the mines for their contracts and regular trade have about sold their all.

A little Kentucky coal continues to come in in isolated cases, but the buyers in this market are prejudiced against Kentucky on account of the high prices asked. The feeling here is that $3 as a maximum is all that the coal should bring. The present market shows that it is down to slightly above $3, although some operators are asking as high as $3.50@$3.75. A little continues to move out into the country at a few points for steam and here and there a car for threshing.

INDIANAPOLIS

Coal has begun getting scarce in Indianapolis and other parts of Indiana. Distributors of coal say the supplies are not coming through as freely as they did two or three weeks ago and the general increase in industrial activity has created a somewhat larger demand. While the utilities and railroads appear to be in shape to stand another sixty days of mining vacation, these smaller industries who were not expecting any production increases, have begun to feel the pinch of want.

Northwest

Buying Picks Up Some in Northwest Market

Steam Coals Sell Better Now That Industries Seem to Be Coming to Life—Prices Are Growing Stronger—But Domestic Business Is Slow.

THE slight quickening of industry throughout the Northwest is having its effect upon the coal market. Steam sizes are selling better and prices have lost their sag. Railroads are taking their share of the available dock coal at the lowest market quotation and enough other buyers are in the market to continue the fear that dock supplies will be exhausted at a time when it is going to be hard to replenish them.

A few more cargoes of soft coal, and small shipments of anthracite have reached the upper ports. In some sections observers "set great store" by the coming crop. If it develops well, an increase in manufacture is expected to follow, so that a busy fall season, especially in the great flour milling section, is anticipated.

MILWAUKEE

An increasing demand from large consumers of steam coal is a new feature of the coal situation at Milwaukee. Domestic consumers are practically out of the market though dealers advise customers to "buy now." Dealers hold that if the strike continues after the lower freight rates go into use July 1, the effect upon the market will more than off-set the freight reductions. Pittsburgh and Youghiogheny coal for steaming was increased 50c. per ton on June 1, and screened Pocahontas and mine run for steaming purposes was increased 75c.

Five cargoes were added to Milwaukee's receipts last week. This makes the total receipts by cargo 8,000 tons of anthracite and 265,297 tons of soft coal, a grand total of 273,297 tons. The movement of anthracite is completely suspended. Last year the record was 256,765 tons of anthracite, and 642,330 tons of soft coal, or a total of 899,095 tons.

DULUTH

Bituminous and anthracite markets at the Head-of-the-Lakes are both following the trend indicated last week and are showing unusual strength with every sign of growing stronger. Coal sages here say that this strengthening indicates a real shortage will take place before the strike is settled and the fast diminishing stocks at Duluth-Superior Harbor are replenished.

Youghiogheny and Hocking are firm at $7 for lump and $6.50 for run of pile. Screenings, of which there is great scarcity are quoted $5.50@$5.75.

Three more cargoes have come to Duluth-Superior harbor and two are on the way from lower ports. The majority of the buying last week was done by the U. S. Steel Corporation subsidiary companies, mining companies and out-of-territory concerns which are stocking up against a possible shortage. It is thought that the steel and mining companies are well taken care of by now as the income tax statement of the steel company showed more than 300,000 tons of coal on docks.

Railroads are taking their share of coal. Some roads have paid as high as the market price for run of pile. This indicates to coal men here that the railroads are uneasy and are taking no chances of a shortage.

Dealers throughout the Northwest are not buying. The demand for bunker coal for Lake carriers, reported as strong two weeks ago, has fallen off. Anthracite is light, but the market is strong. It is estimated that if the strike in hard coal does not end and shipments resume within a month there will be a serious shortage here.

MINNEAPOLIS

The long-expected reduction in freights has been ordered, but coal consumers of the Northwest will not be satisfied. They are hoping that the adjustment of miners' wages will bring about another reduction. The item which causes the most irritation in this district is the cost of hard coal. It is assumed that the revision of freight costs will give about 80c. lower freight charge for the lake and rail route, to the Twin Cities. If the final adjustment of mine wages gives an equal reduction, the total would be around $1.60 a ton. This would bring hard coal at retail down to around $16. This will be far from what consumers have been expecting.

Soft coal took a big slump and then braced somewhat when a good sized tonnage was placed with several railroads, thereby reducing the volume of free coal on the docks materially. Current quotations are from $6 at the dock, up, but buying is slow.

It will probably take some weeks yet before there will be any material increase in industrial consumption. While business prospects are more and more rosy as the crop season progresses, yet until the new crop is well assured, there will be but incidental increased buying which will justify greater manufacturing. The outlook is for a very busy fall, especially with the delayed movement up the Lakes.

New England

Buyers Market Prevails; Little Gain in Demand Seen

Practically no Change in Market, Price Movement Insignificant — Hand-to-Mouth Sales Only, Inquiries of Small Consequence—Cotton Mills That May Open Still Have Reserves.

THE local market is practically unchanged from a week ago. There has been no price movement worth mentioning either at this end or at Hampton Roads, and so far as spot deliveries are concerned it remains a buyers' market. What sales are made are of a hand-to-mouth character and almost no inquiries are heard for more than a few cars at a time.

While effort is to be made to open certain of the cotton mills the reserves still on hand will make unnecessary further buying by these interests for several weeks to come. In a word, there is no indication of any marked increase in demand during June.

Like other steam-users, the railroads are buying only sparingly. Receipts by water continue to be on the May level, but practically all of this tonnage is on contract and leaves little room for spot purchases. With conferences going on at Washington it is to be expected buyers will await results before buying farther ahead than is actually necessary. The trade is also curious to know how the "fair price" will work out, for at this writing it is about 75c. above the current market at Hampton Roads for coastwise shipment. In October 1918 while the Fuel Administration was still functioning, the Pocahontas price was $2.35 and New River, $2.70. We mention this because within a week there have been misleading references to the war-time fixed price.

Meanwhile, tonnage on cars at the Virginia terminals has mounted to new high levels. Accumulations have been in excess of 300,000 tons, of which only 80,000 tons was high-volatile. This shows a very material increase over the previous week.

All-rail receipts continue extremely light, the average daily movement being still less than 90 cars, locomotive supply included. Grades sometimes described as Pools 9 and 10 are being offered freely at the $3.50 figure. There has been occasional demand from the West at prices higher than this, but non-union mines that are in operation are actively seeking orders.

Coastwise freights continue on an easy basis. In every direction there is a surplus of bottoms and it is only the high cost of operation that prevents rates on the larger vessels dropping below 90c. On small barges out of New York for Boston the market is still $1 flat.

Navy Standard grades are $6@$6.15 f.o.b. the Roads. Other prices are quoted in the Weekly Review.

Eastern Inland

Current Sales Predicated On Buyers' Price Views

Consumers Reluctant to Buy Without Inducement as Output Gains and Freight Cut Is Near — Industrial Outlook Favorable—Lake Interests More Active.

BUYERS' price views are very definite and dictate current sales in nearly every instance. The purchaser has found that a withdrawal from competitive bidding has lowered spot quotations and with increasing production, government "price lists" and the coming freight reduction is evincing more reluctance to buy coal unless the price is shaved to make the sale.

Purchases are mainly confined to current needs. The most important feature is the improved industrial tone, which presages a heavier consumption rate and a better fuel demand. Lake interests are more active. The Head-of-the-Lakes is inquiring for tonnage and a strong market is not unlikely if the Northwest is to obtain its requirements during the balance of the season of navigation.

PITTSBURGH

Buyers for Connellsville coal have reappeared in numbers in the market in the past few days, but with very definite ideas of prices they are willing to pay, $3.25 being their maximum, and the market is quotable at this figure, against $3 a week ago. Byproduct is not quotable.

No small tonnage of Kentucky coal is now reaching Pittsburgh. The day after it was arranged at Washington that $3.50 should be the maximum on Kentucky coal quotations were made to Pittsburgh buyers at $2.75, and the market is now steady at $2.85. This coal costs more than Connellsville, delivered Pittsburgh, but has a ready sale on account of quality.

Buying now is chiefly for immediate consumption. Many buyers show a disposition to restrict their purchases this month, to take advantage of the lower freight rates to come.

There are no important developments in either the union or the various non-union strikes. The latter are expected to begin waning in a marked way within about a month.

EASTERN OHIO

The dullness of the past ten days is subsiding and a revival in demand is reported now that the outcome of the Hoover conference in Washington is known. Buyers generally were reluctant to make commitments, contemplating the probability of lower prices in the spot market as a result of these conferences. Likewise, others with fair stocks on hand are looking forward to the savings to be effected by the reduction in freight rates July 1. However, operators and jobbers report that inquiries are not particularly active and the larger consumers are not in the market to the same degree that they were several weeks ago.

Non-union coal from eastern Kentucky and West Virginia is quoted as follows: Mine run, nut and slack and slack $2.90@$3.25; lump sizes, $4.

In the Lake trade, some interest is manifested in the report that all rates on cargo coal from the mines to lower docks will be reduced 20 cents. However, it is claimed that no more than 18,000,000 tons of coal could be transported this year were it possible for shipping to get in full swing by July 1, notwithstanding that the normal requirements of the upper docks are estimated at 24,000,000 tons.

The railroads have approximately 5,000 cars under load at lower docks and dumpings into vessels as well as a number of cars in transit are from 900 to 1,200 cars per day.

BUFFALO

Demand continues so light that one wonders how the prices ever advanced at all. That they fell off again is due to government action and the good amount of coal coming in, especially by Lake. All possible effort is being made to keep prices down to the so-called official level of $3.50. There is, however, the shipper who is sure that prices will soar and who is engaged in pushing them up every chance he gets.

With quite a large amount of coal standing on track here unsold it ought to be easy to keep the prices down. One difficulty is that the consumer does not always place confidence in the shipper and if he goes into the market on his own account and bids against other consumers he is lost.

The price range is wide, for some coal has to be sacrificed and is offered as low as $3.25 for any size, slack being most active, and some brings $4 readily, with a little up to $4.25@$4.50. No real gas coal is offered. Only mine prices are quoted.

The amount of bituminous coming in by Lake for the last week fell to 67,700 net tons, most of it going to the furnaces for coke making.

CLEVELAND

Rising production records, the government's move to put coal prices upon a fixed basis, and the lower freight rates effective July 1, have combined to increase the attitude of reluctance on the part of buyers in this district. With the prospects of an acute coal shortage growing more remote, and with the threats of leaping prices taken care of, consumers consider that they are taking no chances by postponing purchases until the new freight rates go into effect. Kentucky coal is arriving in sufficient quantities to take care of requirements and some jobbers have limited supplies on hand.

The most interesting development in this district, foreshadowing the probable demand for coal later in the year, is the continued improvement in business. The circle of increasing plant operations is an ever widening one, as evidenced by the May report for employment in Cleveland. This shows an increase of 3.1 per cent during the month against a gain of 2.1 per cent in March. The greatest gain was made in iron and steel and their products, the increase amounting to 7.2 per cent.

Receipts of bituminous coal reflect a lessening demand during the past ten days. Receipts for the week ended May 27 were 992 cars, the lowest for any week during the month.

COLUMBUS

There is a decided slackening in volume of business done. Consumers are waiting until after the new freight rates take effect and until prices are thoroughly stabilized by the efforts of Secretary Hoover.

Public utilities, railroads and iron and steel plants are buying only what is immediately necessary. Despite the fact that prices are about 50c. lower than those mentioned by the Department of Commerce, still this does not attract buyers.

With householders content to wait until the strike is settled, little attention is being given the retail trade. Dealers have pretty fair stocks which they are trying to clean up before freight reductions become effective. Retail prices have increased some in sympathy with the higher prices at the mines. Hocking lump is now selling $6@$6.50 and West Virginia splints, $7@$7.50. Pocahontas lump is $7.50@$7.75.

Lake trade is showing up better, although only a small tonnage is moving. Contracts which have been closed are few as the price question is still up in the air.

DETROIT

Only a limited degree of interest is being manifested in the market. Dullness and lack of buying demand are prominent features of the situation. The reduction of freight rates has developed a new reason for delaying purchases. Buyers are holding off orders now to be in position to take advantage of the lower rate.

Some jobbers direct attention to the fact that the dilatory buyers may find themselves in the position of paying more for their coal after July 1 than the price at which it may now be obtained. With so many buyers coming into the market together there is reason to believe that the law of supply and demand will be found operating in a way to advance the price to an extent that will more than offset the amount saved on lower freight charges.

Lump and egg from West Virginia or Kentucky is quoted $3.25@$3.50; mine run and the finer sizes at about $3.

NORTHERN PANHANDLE

Strikers have been unable to check production except in a few isolated instances and at other mines there has been a steady growth in production since the inception of the strike, the output in this territory being in excess of 60,000 tons a week. Many mines are producing railroad fuel which is in strong demand, and there is also a heavy movement to the Lakes. Inquiries from northern markets are plentiful.

Cincinnati Gateway

Aloof Attitude of Buyers Causes Shrinkage of Prices

All Sizes but Lump Fall to $2.50—Speculators Driven to Cover—Hoover Price Level Approved by Coal Men—Lake Market Shows Much Life.

THE shifting winds of trade drove the price of all grades and sizes of coal, with the exception of lump, down to $2.50 within the past week, wholly through the buyers standing off indifferently and allowing enough coal to accumulate either at the scales or at the mouth of the mines to scare the speculator and others who had gone to the fields to buy, back to their own stamping ground. Within the past week a goodly number of persons who had been noted as being in the fields for the purpose of buying coal returned to their headquarters under the continued state of depression.

Hoover's price conference holds the center of the stage. The speculative element in the trade is fast waning and coal men feel that a $3.50 maximum price is one that should satisfy all producers. The Lake market is showing decided signs of life.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

Additional New River mines having resumed operations production is now approximately 50 per cent of potential capacity. The last week of May saw many of the larger mines in the region once again operating on a non-union basis, although the resumption was not without violence and threats in some instances. Little other than mine run is being produced. Price declines have occurred during the past 10 days.

Strike losses in the Gulf region have been almost completely obliterated but a shortage of labor is handicapping operators to some extent. Market conditions are not quite so strong as June opens.

POCAHONTAS AND TUG RIVER

Pocahontas mines are producing at the rate of about 70,000 tons a day, which is far above normal. Producers have some heavy contracts to fill but a part of the output is being sold on a spot basis. There are less indications now of a runaway market than was the case a few weeks ago. Although there is a growing demand in Eastern markets, nevertheless the tonnage for the West is heavy.

Production is at the maximum in the Tug River territory, where more than 100,000 tons were produced during the last week of May. Demand is good, particularly in Western markets, a very heavy tonnage being shipped to steel manufacturers and to byproduct concerns. Some difficulty has been experienced in securing all the cars needed.

HIGH-VOLATILE FIELDS

KANAWHA

More mines have been added to the list of those in operation. The demand is sufficient to readily absorb what tonnage there is produced. Inquiries from Tidewater sources are heavier in volume.

LOGAN AND THACKER

Although prices were a little off in the Logan field during the closing days of May, the demand had not been affected to any perceptible extent by the prospect of some sort of price regulation, and mines had all the orders they could handle. Although the bulk of the output is moving to Western markets, there is also a heavy tonnage being sent to the Lakes. Prices not having advanced as much in this part of the state as in other sections, price recessions were not so marked.

Thacker mines wound up the month with a heavy production, amounting to approximately 180,000 tons a week, much of which was originated in the Williamson field where all mines are now in operation and where the strike is making no inroads on the output. The bulk of the output is being handled through the Cincinnati gateway and through Columbus, with a large tonnage moving to the Lakes. Much tonnage is being taken by railroads.

NORTHEASTERN KENTUCKY

Although further price increases had been anticipated at the rate buyers were invading the field, imminence of some sort of price regulation has served to reduce prices, mine run being $2.58@$3. Little other than mine run is being produced. The heaviest demand is from buyers in Ohio and Michigan. Railroads are securing a large tonnage and there is also a heavy movement for the Lakes.

CINCINNATI

The talk of a strike of the shopmen and maintenance of way men of the railways failed to make any deep impression here, so far as price was concerned. Monday the market opened around $2.50 but following Memorial Day there was a little spurt upward, just another that has been starting several times since the last letter was written for this column. Far more interest was displayed in the conference with Herbert Hoover, later on in the week and the possibility of governmental regulation. Here the wholesalers and jobbers are looking for a $3.50 maximum price as being the one that will hold best in a gentleman's agreement.

The smokeless situation is practically unchanged. Both New River and Pocahontas operators are holding for a set price on egg and lump. Again a good bulk of this trade is being diverted to the Inland points because of the slackening interest at Tide.

The retail situation continues a puzzle. About half of the trade are asking $8 for smokeless lump—and are getting it. The other half have not changed from the $7.50 basis and both are offering run of mine for $6.50@6.75, a slight advance. There has been no change in the high volatile mine run prices, but slack, which is quoted at $5.50 is being sold all the way down to $4.75, the latter with the stipulation that the buyer pay for or arrange for cartage.

Coke

CONNELLSVILLE

Offerings of Connellsville coke continue very light, involving an amount that would be almost neglible in ordinary times. The Pittsburgh Steel Co., which bought freely recently in order to blow in one of its blast furnaces, is now out of the market and appears to have a fair accumulation. In the past two or three days several inquiries have come from Eastern furnaces and a moderate volume of business has been done in that quarter in odd lots to supplement current supplies of the furnaces involved. The market for furnace coke, which was approximately $7 a week ago, is now very firm at that figure.

Foundry is now reported to have sold at $7.50, the first time in this movement that the figure has been reached. Foundries are buying very little. Not a few state that their stocks will last until about Aug. 1.

Strikers are holding out well, there having been but few returning to work thus far. The common guess is that men will begin returning to work in numbers in about a month.

The *Courier* reports production during the week ended May 27 at 45, 350 tons by the furnace ovens and 13,780 tons by the merchant ovens, a total of 59,130 tons, an increase of 1,700 tons.

UNIONTOWN

There were no direct representatives of the Connellsville region at the Washington conference which resulted in Mr. Hoover fixing a price of $3.50 generally as the maximum which will obtain during the present strike. Telephonic conversation with several operators here is understood to have brought no results.

While that situation is working out the market is lower than the Hoover $3.50 price and until it takes a jump the attitude of Connellsville operators toward the Hoover plan will not become known.

The local market has been $3.25@$3.50 for two weeks with most tonnage going at the former figure.

BUFFALO

Heavy users of coke are as a rule provided with enough local byproduct supply to satisfy all needs. Only when they need some special variety do they go outside for anything. The big local furnaces are pretty active, but iron ore is coming in at a slow rate as yet. Coke quotations remain at $7 for best 72-hr. Connellsville foundry, $6 for 48-hr. furnace and $4.10 for stock, with chestnut for domestic use nominal at about $4.50, to which add $3.64 for freight.

News Items From Field and Trade

ALABAMA

The School of Mines, College of Engineering, University of Alabama is offering a short course in coal mining, from June 19 to July 15. The course affords an exceptional opportunity to prepare for the state mine examinations. The university makes no charge for the course.

CONNECTICUT

The Wheeler & Howes Co., Bridgeport, for more than sixty years in the coal business is winding up its affairs. The large wharfage on the Pequonnock River will be disposed of, and the rest of the property will be sold by the trustees. The move to dissolve the corporation comes from a result of business depression and the constantly growing competition.

ILLINOIS

E. F. Towler, of Chicago, treasurer of the Chicago, Wilmington & Franklin Coal Co., has returned from a vacation of steady golfing.

G. J. Rhineck, assistant sales manager for the Bell & Zoller Coal Co., is enjoying a two-weeks' layoff.

In spite of the fact that the mines in and around Marion in Williamson County have been closed for over eight weeks and that the chief industry of the county with over thirty mines is that of coal mining, it being the second largest producing coal county in the state, the bank deposits have increased more than $500,000 since March 15. On that date deposits in Marion were $4,652,000.

Preparations are being made by the **American Coke & Chemical Co.**, to sink several test holes near McLeansboro, White County, for the purpose of locating a site for the shaft of a large mine. Machinery for drilling the holes has been unloaded and operations are to start at once.

B. H. Firth has been named as superintendent for the mine of the Slogo Coal Co., near Marion. Mr. Firth has had a wide experience in mining. He was secretary and general manager of the Hoskins-Cantine Fuel Co., Sioux City, Ia., general superintendent of the coal department of the Standard Oil Co., at Carlinville, Ill., and a member of the Illinois State Executive Board of the United Mine Workers.

The Orchard Coal Co., operating at Marion, has filed notice of increase of capitalization from $300,000 to $600,000, with the secretary of state at Springfield. The company has a valuable operation in Williamson County.

J. M. Dillavou, Chicago, president of the Harris-Dillavou-Dimond Co., was in Champaign and other down-state towns recently on business. The Harris-Dillavou-Dimond firm sells for the Southern Gem Coal Co., one of the new operating companies and one which controls a number of large collieries in Franklin, Perry and other counties.

W. H. Leland has been elected vice-president and general manager of the Union Fuel Co., Springfield.

After 15 years of litigation the widow of Ricardo Milani, a miner killed while he was on his way to work, appears to have won $3,000 from the **Illinois Third Vein Coal Co.** by a decision of the Appellate Court at Ottawa sustaining a verdict of last fall. The company may appeal to the Supreme Court. The case has been tried five times during the litigation.

INDIANA

With the idea of acquiring, at some time in the future, mines in the West Virginia and Kentucky coal fields, the **Interstate Fuel Co.** has been incorporated with a nominal capitalization of $20,000. The company will deal in Eastern coal until its own mines are ready. The organization has temporary offices in the Merchants National Bank Bldg., Indianapolis. The incorporators are James W. Costin, M. W. Costin and Frank A. Woop.

Governor McCray has announced the appointment of a **commission to codify the mining laws of the state** and to recommend new legislation relating to the mining industry. The commission as named is as follows: John Hessler, Terre Haute, president of District No. 11, United Mine Workers; William Mitch, Terre Haute, secretary of District No. 11, and John A. Templeton and Henry Adamson, representing the operators; Cairy Littlejohn, chief deputy state mine inspector, and S. J. Wilton, assistant mine inspector, representing the state mining department. The commission is to meet and organize not later than six months before the convening of the 1923 session of the General Assembly and is to submit a report to the governor on or before Jan. 1, next. It is pointed out that the general mining law was enacted in 1905 before the introduction of many of the modern methods of mining coal. Although the law has been amended several times and additional statutes enacted, the present laws are regarded as unsatisfactory.

Elmer Q. Lockyear, judge of the Vanderburg County Probate Court at Evansville, Ind., has granted Frank C. Gore, receiver for the **Fricke & Blair Coal Co.**, permission to open the **Possum Ridge Coal Co.**'s mines in Warrick County on the Evansville and Boonville traction line. The mine was purchased by the Fricke & Blair Co. before it went into bankruptcy several months ago.

The Coalmont Coal Co., of Sullivan, has filed a final certificate of dissolution.

Louis Schauwecker, in the mercantile business at Clay City, through the United States Trust Co., of Terre Haute, has completed arrangements for the purchase of a lease on 610 acres of land in Clay County from the **Brazil Block Coal & Clay Co.**, at one time the largest coal producer in Indiana. The price was $15,000.

IOWA

The Pearson Coal Co., Clarinda, has secured a twenty-year lease with right and option of renewal on two hundred and forty acres of coal land adjoining Clarinda. A shaft will be put down and an electric line will be extended to the mine.

KENTUCKY

The coal operations of the **Big Sandy** near Paintsville, are operating full time, with more coal passing over the Big Sandy division of the C. & O. than at any time at this season of the year in the history of the industry. All companies are working with the exception of the Northeast Coal Co.'s Thealka and Auxier operations; the Consolidation Coal Co., Van Lear, and Ayers & Lang Coal Co., Offutt. Miners at these places walked out on strike April 1 and have been out since, with the exception of the Northeast Coal Company's No. 3 mine. Union miners at this operation resumed work on May 20 and it is thought that all Northeast miners will be back to work early in June.

The East Harlan Coal Co., located in Harlan County at Ages, and belonging to Huntington, Ind., interests, has started up, after having been closed over a year.

John Hoffman, vice-president of the Kentucky Fuel Co., was recently in Bell County and through his efforts was able to get the company's Hignite mine again in operation, after being out nearly two months on account of labor trouble.

The Liggett Coal Mining Co., Hazard; capital, $60,000 has been formed. Incorporators are H. S. Adkins, Hazard; G. P. Foley, Staub, and W. W. Reeves, Hazard.

A report from Whitesburg is to the effect that the newly formed **Elkhorn Block Coal Co.**, will develop large holdings in the Shelby Creek section of the headwaters of the Big Sandy, just over the Letcher line.

With a capital of $30,000, the **New Duane Coal Co.**, Hazard, has been chartered by **A. S. Petrey**, M. A. Petrey and Maude Petrey to be an operating company.

MASSACHUSETTS

Bernard L. McDonald, Lawrence, is planning the construction of an elevated coal pocket of 1,200-tons capacity.

The Osterman Coal Co., of Wamesit, in the Town of Tewksbury, will construct a 600-ton coal pocket in that place shortly. The pocket will be of the elevated type, and will also have scales, coal bunkers, etc.

MISSOURI

The contract for the Board of Education for St. Louis public schools for approximately 10,000 tons of coal has been awarded the **Union Fuel & Ice Co.** at $4.19½ delivered, based on the present freight rate and mining scale, with the understanding that any decrease shall be effective on the price. This is 6c. a ton under the price paid last year under the present wage scale and freight rate.

NEW YORK

The gas and electric lighting companies in Greater New York are not short of fuel, according to the reports as of May 13, although stocks have declined since April 30. On tha. date the **Brooklyn Edison Co.** had on hand 405 tons of anthracite (613 on April 30) and 79,227 tons of bituminous coal (86,202 on April 30); **New York Edison Co.**, 9,254 tons anthracite (12,497 April 30) and 199,651 tons bituminous (240,119 April 30); **Brooklyn Borough Gas Co.**, 1,706 tons anthracite (1,653 April 30), 2,092 tons bituminous (2,272 April 30); **Brooklyn Union Gas Co.**, 115,273 tons anthracite (120,223 April 30), 1,833 tons bituminous (2,247 April 30); **Consolidated Gas Co.**, 183,128 tons anthracite (190,150 April 30), 175,614 tons bituminous (189,262 April 30); **Westchester Lighting Co.**, 29,417 tons anthracite (30,599 April 30), 7,613 tons bituminous (7,977 April 30).

OHIO

W. N. Puckett, president of the Cabin Creek Consolidated Coal Co., with headquarters at Charleston, was in Cincinnati recently.

There was quite a spread in the prices that were shown when the School Board bids were opened in Cincinnati. One company offered to supply the downtown districts with high-volatile mine run at $4.[illegible]@$4.70, while the next lowest bid was $5.87. The spread between the prices on Pocahontas was not so great, the low being $5.33 and the next bidder $5.85. The School Board, however, was not bargain hunting but decided to lay the bids over for a week before deciding whether they would enter into a contract or not.

Victor White, Western sales manager for the Flat Top Coal Co. suffered a broken rib in an automobile accident which took place near the Indiana state line on Memorial Day. The rest of his family which was in his car escaped unhurt except for a shaking up.

E. C. Mahan of Knoxville, Tenn., who was in Cincinnati recently said that one of the Southern Coal & Coke Co.'s Dixie Gem mines had resumed operations and that the rebuilding of the tipple of another that had been set afire because of labor troubles was progressing nicely. Mr. Mahan was accompanied by **J. H. Bowling**, **J. H. Gatliff** and **W. A. Ellison** of the operating department.

Recent trade visitors to the Cincinnati market were, **George Camp** of the Coal Creek Coal Co., of Knoxville; **A. L. Allais**, of Chicago; **E. A. Dean**, of the Deaggins Coal Co., Huntington; **D. C. Campbell**, of the D. C. Campbell Coal Co., of Knoxville, and **Scott Litten** of the Dixie Splint Coal Co., of Clinchfield.

L. E. Woods, president of the Central Pocahontas Coal Co., and the American Coal Cleaning Co., of Welch; **H. E. Booth**, vice-president in charge of sales for the M. A. Hanna Co., of Cleveland; **W. H. Bradford**, sales manager for the Fentress Coal Co., of Nashville; **Charles Kline**, of the Wauban Coal Co., Chicago, and **G. W. Gamble**, manager of the Washington Coal Co., of Jackson, Ohio, were among the prominent coal visitors to the Cincinnati market recently.

Julius Ratterman, sales manager of the Blue Ash Coal Co., Cincinnati, was elected by the Cincinnati branch of the Wholesale Coal Association to succeed **Fred Legg** of the Logan and Kanawha on the national board of directors.

Calvin Holmes who has been director of sales for the Blue Diamond Coal Sales Co., Cincinnati, for the past five years has been succeeded by **Fred Gore**, manager of the Southern office of the company at Atlanta. Mr. Holmes resigned because of a difference in opinion over policy with the other directors of the corporation. He will continue as a stockholder, however. He has not announced his plans, but will take a rest at his home in Knoxville, Tenn. for a month.

The Greenlee Coal Co., Bellaire, has been chartered with a capital of $10,000 to mine and sell coal in the Belmont County region. Incorporators are James F. Cook, W. C. McClain, St. Clair Archer, Arthur A. Beckmann and L. L. Cunningham.

A score of coal companies, using power from the Southern Ohio Power Co., The Hocking Power Co., and the Athens Electric Co., have appeared in the Ohio Supreme Court from a decision recently announced by the Ohio Utilities Commission, holding that the power companies were not public utilities and thus did not come under the jurisdiction of the commission. The coal companies, led by the **Ohio Mining Co.**, want rates for electrical current fixed by the commission.

The H. W. Jenkins Coal & Coke Co., Columbus, has been chartered with a capital of $25,000 to do a general jobbing business. It is simply the incorporation of a wholesale business conducted in the Gasco Bldg., under the name of the **H. W. Jenkins Coal Co.** Incorporators are H. W. Jenkins, Clara L. Jenkins, J. A. Jenkins, Rachael A. Jenkins and F. B. Collins. H. W. Jenkins is president and manager and F. B. Collins, secretary and treasurer. The company has been made exclusive sales agent for the **Chattaroy Coal Co.**, at Hatfield, W. Va., on the main line of the Norfolk & Western.

PENNSYLVANIA

The injunction secured by the **Pennsylvania Collieries Co.** at Indiana against the union organizers was dissolved on June 2, by Judge J. M. Langham, on motion of counsel for the complainant company. The restraining order was issued by Judge Langham on May 1.

The Marion-Westmoreland Collieries Co., of New Florence, will operate the property purchased by its president, Howard B. Payne, from the former Werder Coal Co. The operating company is in need of such additional equipment and supplies for developing the property as a 100 kw. or 150 kw. motor generator set, rails, steel ties, etc. The company will also build 30 miners' houses.

An explosion of dynamite under the boiler house at the Patrick plant of the **Nicholson Coal & Coke Co.**, near Masontown, occurred recently. A wire was found leading from the scene. Little damage was done. Dynamite was exploded in a similar manner at the same place about two years ago.

Frank E. Weddell, a prominent figure in the Connellsville coke trade for many years, returns to the trade and the **Producers Coke Co.** again becomes an active factor through its re-organization, Mr. Weddell being elected vice-president. Mr. Weddell disposed of his interests in the Whyel corporations last February and since has been inactive. The officers of the Producers company are Charles E. Lenhart, president; F. E. Weddell, vice-president; I. W. LaBarrer, secretary and J. W. Abraham, treasurer. The board of directors consists of G. S. Harah, T. J. McClernan, C. E. Lenhart, F. E. Weddell, Charles H. Loucks, J. W. Abraham and Charles Hoover. The company will represent a dozen independent coke operations having a capacity of 100,000 tons of coke per month, and connections are also being made with a group of byproduct coal operators and the Producers will also be the selling agency for about 100,000 tons of coal monthly.

The Richmond breaker, one of the oldest breakers in the Lackawanna Valley, located in Dickson City, is being razed by the present owners. The property was at one time owned by the Scranton Coal Co., but was sold recently.

The Common Pleas Court of Allegheny County has decreed that the order of the Workmen's Compensation Board granting an appeal to Mamie Johnson, claimant in a case against the **Diamond Coal & Coke Co.**, and directing a new hearing, be reversed and that the prior decision of the referee is sustained. The prior decision was that the claimant is not entitled to compensation because of the death of Albert Johnson, whom she claimed was her husband. Two women claimed to be the widow, and the board held that the claimant in this case had not proved her contention.

Surveys of the river coal industry of Pennsylvania, just completed by the bureau of statistics and information of the Pennsylvania Department of Internal Affairs, show that in 1921 a total of 476,400 tons were removed from the rivers and streams of the state in the anthracite district. This coal had a value of $697,200. In 1920 there were 551,100 tons of coal reclaimed of a value of $844,700. There were 49 concerns engaged in reclaiming coal from the streams last year and they gave employment to 338 persons. Wages paid during the year totaled $250,000 and the capital invested in the industry amounted to $954,600.

The Pennsylvania Bureau of Rehabilitation has come in contact with 2,475 injured persons and has rendered assistance to 902 of these cases. Industrial accidents contributed the largest percentage of cases acted upon by the bureau. More than one-third of the rehabilitation cases came from the mines where 724 persons of this class of accidents were registered with the bureau.

Attorney General George E. Alter has advised Seward E. Button, chief of the State Department of Mines, that it will be lawful and proper for the department, in the exercise of the sound discretion vested in it by law, to authorize the erection of a non-inflammable breaker within a distance of 200 ft. of the opening of a coal mine. Such authorization, the opinion holds, is not in conflict with the provisions of Section 5 of Article 4 of the act of June 2, 1921, which provides that no "breaker or other inflammable structure for the preparation or storage of coal shall be erected nearer than 200 ft. to any such opening."

Judge John A. Berkey spent an entire week recently, hearing the injunction cases in Somerset County against the U. M. W., instituted by the **Berwind-White Coal Co.**, and other operators. Attorney Percy Allen Rose of Johnstown represented the Windber company, while John J. Kinter represented the U. M. W.

The Hillman Coal & Coke Co. is making use of the strike period to complete the change at the Isabella plant at Hillcoke from making its own power to purchased power, dispensing with all the steam equipment.

The Arrow Coal Mining Co. has notified the State Department at Harrisburg of an increase in its capital stock from $50,000 to $500,000; S. A. Gilmore, Allegheny County, is president.

TENNESSEE

The Roach Creek Coal Co., of Oneida, will open workings in two seams, the Blue Gem and the Jellico with an average total daily output of 3,000 tons. Work on the new mines will be rapidly pushed to completion. The company will build a modern town at Roach Creek.

VIRGINIA

W. A. Benjamin of Philadelphia, alleged to have been the chief promoter of the **American Fuel Co.**, which operated with headquarters in Staunton during the summer and fall of 1920, has been indicted for grand larceny by the grand jury in Circuit Court at Staunton. This is said to be the forerunner of sweeping indictments of Benjamin's associates, several of whom were Staunton men, by a special grand jury. It is alleged that the $200,000 worth of capital stock sold by promoters of the company was diverted by Benjamin and his associates for their own purposes. It is further charged that they obtained stock subscriptions on the claim that the company owned the title to valuable coal lands in West Virginia, a claim later found to be false.

WEST VIRGINIA

William McKell, president of the McKell Coal & Coke Co., has resigned as a member of the Capitol Building Commission of West Virginia.

A. T. Watson, purchasing agent of the Consolidation Coal Co., with headquarters at Fairmont has returned from an Eastern business trip.

Tracts aggregating 8,000 acres of coal across the river from Hinton, in the angle formed by the junction of Glade Creek with New River, have been purchased from different owners by the **Eastern Coal & Mining Co.**, a Baltimore corporation, which plans development on a large scale. The purchase price aggregated $600,000.

Announcement of a semi-official nature was made during the latter part of May that Mines Nos. 3 and 4 of the **New River & Pocahontas Coal Co.**, at Minden, would resume operations on June 1 and that the services of about 300 men would be utilized.

The company's Weirwood plant overlooks Willis Branch and some of those who formerly worked at Weirwood are charged with complicity in attacks on the Willis Branch Coal Co. property.

On May 24 the high-power transmission line tower of the **Virginian Power Co.**, at Elverton, where the mines of the Beury interests operate, was blown over by dynamite and for a time eight coal companies were out of commission because of lack of power. State police and blood hounds taking up the trail, arrested George Haynes, a miner of Gatewood.

The Betty mine of the **Stone & Scott Coal Co.** at the outset of the ninth week of the strike was being heavily picketed by striking miners from Monongah and Norway, in the Fairmont field. One effect of the picketing in force was to deter many of the men from reporting. The sheriff and prosecuting attorney of Monongalia County made an investigation, the latter reporting that the strikers were not encroaching upon company property. The company applied to the governor during the last week of May for protection, asking that a detachment of state police be assigned to duty at the mine. This request was resisted by the prosecuting attorney who said county officials were capable of handling the situation.

WASHINGTON, D. C.

George H. Barker, vice-president of the Maynard Coal Co., in the southern Ohio field, has been elected to succeed himself in the National Coal Association by the Southern Ohio Coal Exchange and other operator associations in that district. The Eastern Ohio field is represented by **S. H. Robbins**, of Cleveland, while **Michael Gallagher**, of Cleveland, is a director at large.

The construction of the Miami and Lake Erie Canal between Toledo and Cincinnati, with a branch from Defiance connecting Lake Michigan, was advocated by Representative Thompson, Ohio, in a speech, in the interest of securing cheaper coal. He said that coal could be transported through the canal from Cincinnati to Toledo for 29c. a ton and that the canal would save from $4 to $6 a ton on coal.

The fuel appropriation for the Army for the year beginning July 1 is increased from $3,000,000 to $3,500,000 by the Senate appropriations committee in reporting the War Department appropriation bill.

In a decision by Justice Holmes, the Supreme Court has set aside a decision of the Court of Appeals of the District of Columbia in a case brought by the **Santa Fe Pacific Railroad**, involving Western coal lands. Lands selected by the railroad in place of an original grant were held by the Interior Department to be more valuable as coal lands than the original lands, although both tracts were coal lands. The Interior Department declined to approve the selection of the lands by the railroad, holding that the term "quality" under the law was as to the quality of the coal and not the land. The railroad contended that quality meant kind and not value and that as both the base and lieu lands were coal lands they were equal in quality and the Department's refusal to approve its selections was an exercise of arbitrary discretion. The Court of Appeals of the District upheld the Interior Department in its interpretation as to the value of the lands; the Supreme Court, however, reversed the decision, giving title to the railroad to the second location of lands in question.

In opinions by Justice Holmes the United States Supreme Court he decided against the **Morrisdale and Pinchill Coal companies** in their cases from the court of claims contending for prices in excess of those fixed by the Fuel Administration during the war. The Morrisdale company had asked for recovery from the government of the difference in the price per ton for coal diverted by the administration and coal previously sold under contract at higher prices. The Pinchill company asked for the difference between the maximum price per ton of coal fixed by the Lever Law and the price it could have received had the government not interfered. The court of claims rejected the claims of the companies on the ground that the Lever Law, fixing prices, did not obligate the government to pay coal interests the difference between the government fixed prices and prices which could have otherwise been obtained.

Traffic News

In a complaint to the I. C. C. the **Virginia Coal Operators' Association of Philadelphia** allege prejudicial and preferential rates on coal from mines in the Appalachia group in Virginia and Kentucky as compared with rates from Harlan County, Ky.

The I. C. C. has authorized railroads to establish rates on coal from mines in Illinois in Groups 1 and 2 named in the Missouri Pacific R.R. tariff; in Group 3 named in the Illinois Central tariff; and in Group C named in the Chicago & Eastern Illinois tariff, to stations on the Butler County R.R., via Thebes, Ill., St. Louis Southwestern Ry., and Piggott, Ark., the same as rates in effect from and to the same points via Thebes, Ill., and the St. Louis-San Francisco Ry.

In a complaint to the I. C. C. the **Peerless White Lime Co.**, alleges unreasonable rates on coal from mines in Illinois to St. Genevieve and Mosher, Mo.

The Gulf Coal Co., of Tams, W. Va., alleges unreasonable rates and regulations in connection with the transportation of coal from Hot Coal, W. Va., and requests rates on the New River district basis.

The Indiana State Chamber of Commerce, of Indianapolis, in a complaint to the I. C. C. alleges unreasonable rates on bituminous coal from Ohio district No. 8 and Inner Crescent groups to Terre Haute and other points in Indiana.

In the complaint of the **Old Ben Coal Corporation** the Interstate Commerce Commission decides that the rates on rock or shale dust from West Frankfort, Ill., to Christopher and Sesser, Ill., during Federal control were unreasonable.

In the complaint of the **National Retail Coal Merchants' Association** an I. C. C. examiner recommends that the rules, regulations and practices of the B. & O. and other railroads covering the transportation of hard and soft coal and coke and rates applicable thereto are not unreasonable or unlawful.

The West Kentucky Coal Bureau in a complaint to the commission alleges unreasonable rates on coal from mines on the L. & N. in western Kentucky to points in the North and Northwest because of the absence of through joint rates. The commission is requested to establish rates which shall not exceed those from mines in southern Illinois by more than 25c. a ton.

The Tuffi Bros. Pig Iron & Coke Co., of St. Louis, in a complaint to the I. C. C. alleges unreasonable rates on coke from Indianapolis to Marshalltown, Ia.

The Chamber of Commerce of Menominee, Mich., has petitioned the United States District Court for a permanent injunction restricting enforcement of the order of the Wisconsin Railroad Commission reducing freight rates on coal shipped from Lake ports in Wisconsin to points within the state. The claim is made that the order discriminates against out-of-state coal men who are forced to pay higher rates on coal from points across the borders of their states. It is also held that the order is in violation of the interstate commerce provision of the federal constitution. The order went into effect May 10.

It is reported from division headquarters of the **Southern Railway**, at Knoxville, Tenn., that the company has placed contracts for 20 additional locomotives, 5,390 freight cars, 500 auto cars and 250 cabooses, the cars to be of all-steel construction except the cabooses, which will have steel underframe construction.

Recent Patents

Draft Device for Mining Machines. Thomas E. Pray, Chicago, Ill., assignor to the Goodman Mfg. Co., Chicago, Ill., 1,411,932. April 4, 1922. Filed Nov. 20, 1920; serial No. 425,655.

Rotary Drill Cutter. Howard R. Hughes, Houston, Texas, 1,412,003. April 4, 1922. Filed Oct. 28, 1920; serial No. 420,257.

Coal Washer and Separator. William F. Martin, Wormleysburg, Pa., 1,412,291. April 11, 1922. Filed Sept. 12, 1921; serial No. 500,101.

Socket for Miners' Drills. Peter J. Desselle, Weir, Kan., assignor of one-half to Frank [illegible], Weir, Kan., 1,412,676. April 11, 1922. Filed Nov. 9, 1920; serial No. [illegible].

Coal-Loading Apparatus. John H. Miller, MacDunn, W. Va., 1,411,928. April 4, 1922. Filed Nov. 16, 1920; serial No. 424,399.

Mining-Machine Truck. Frank Cartlidge, Claremont, N. H., assigner to Sullivan Machinery Co., 1,401,759. Dec. 27, 1921. Filed Oct. 10, 1917; serial No. 195,754.

Coupling for Mine Cars. Joseph E. Duke, Birmingham, Ala., 1,401,890. Dec. 27, 1921. Filed March 29, 1921; serial No. 456,580.

Clamshell Machine. Edwin J. Armstrong, Erie, Pa., asignor to Ball Engine Co., Erie, Pa., 1,401, 951. Jan. 3, 1922. Filed Dec. 6, 1916; serial No. 135,330.

Flotation Machine. John T. Shimmin and Clyde E. Bushnell, Butte, Mont., 1,402,099. Jan. 3, 1922. Filed Jan. 25, 1917; serial No. 144,492.

Apparatus for Coking Coal. Claude M. Garland, Chicago, Ill., 1,402,413. Jan. 3, 1922. Filed Dec. 22, 1917; serial No. 208,346.

Coal Briquet and Process of Manufacturing the Same. Charles M. Machold, Philadelphia, Pa., 1,404,869. Jan. 31, 1922. Filed Jan. 28, 1921; serial No. 440,746.

Surveying Instrument. John P. Shaw, Goedgevonden, Transvaal, South Africa. 1,406,017. Jan. 31, 1922. Filed March 29, 1921; serial No. 456,647.

Drill Sharpener. Wade H. Wineman, Chicago, Ill., assignor to Sullivan Machinery Co., Chicago, Ill., 1,405,084. Jan. 31, 1922. Filed May 6, 1919; serial No. 295,061.

Operating Mechanism for Mine-Shaft Doors. Harry F. Kohler, Dunlo, Pa., 1,403,420. Jan. 10, 1922. Filed Apr. 26, 1921; serial No. 464,677.

Mining Machine. Albert Ball, Claremont, N. H., assignor to the Jeffrey Mfg. Co., Columbus, Ohio, 1,403,829. Jan. 17, 1922. Filed March 12, 1910; serial No. 548,856.

Running Gear for Mine Cars. Robert D. Scott and John G. Cadwell, Roslyn, Wash., 1,403,872. Jan. 17, 1922. Filed Nov. 19, 1921; serial No. 516,348.

Association Activities

Smokeless Coal Operators' Association of West Virginia

In response to a call issued by President E. E. White, a meeting of that association was held in Washington, D. C., on May 30. Although no announcement of the purpose of the meeting was made, it is believed that consideration was given informally to the recent suggestion of Secretary Hoover as to prices. Among those in attendance at the meeting in Washington were the following: J. C. Sullivan, W. P. Tams, Prince E. Lilly, John Laing, Alex Laing, F. M. Lee, C. H. Mead, P. M. Snyder, D. H. Frazier, W. B. Beale, A. F. Leckie, W. H. Ruby, J. B. Clifton, Justus Collins, Edward E. White, C. R. Stahl, Fred O. Wood, Richard Hewitt, T. O. Deaumer, J. C. Hindsley, J. C. Pack, P. C. Lynch, C. L. Goodwin, Harvey H. Morris, G. W. Craft, L. R. Taylor, E. C. Minter, W. A. Phillips, J. E. Jones, Carl Scholz, A. Z. Litz, W. Gaston Caperton, G. H. Caperton, Enoch Ellison, A. J. King and George Wolfe.

Trade Literature

The Esterline-Angus Co., Indianapolis, Ind., has issued a four-page folder, Bulletin 322, descriptive of its meters, transformers and recorders.

Caterpillars for Railroad-Type Shovels—The Bucyrus Co., South Milwaukee, Wis. A short announcement that the company is prepared to equip all sizes of railroad-type shovels with caterpillar traction and describing the principle advantages of this installation.

Scovell, Wellington & Co., accountants and engineers, with headquarters at Boston, have compiled a special list of "**Selected Professional and Business Books.**" The books are grouped under the heads: General Accounting, Auditing, Banking, Municipalities, Other Applied Accounting, Cost Accounting, Industrial Engineering, Employers & Employees, Depreciation and Valuation, Commercial Law, Economics, General Business, Advertising and Selling, and Handbooks

Forty Years of Progress. An announcement by the Heine Boiler Co., telling of its change of name and describing some of its new developments in boiler design. Illustrated

Portable Electric Drills. The Black & Decker Mfg. Co., Baltimore, Md. Pp. 18; 8½ x 6 in.; illustrated. Describes not only portable electric drills but also post and bench drill stands, portable electric grinder, safety cleaning machine and electric valve grinder.

Whitney Free Floating Coupling. Kay Mfg. Co., Norwalk, Conn. Pp. 8; 6 x 9 in.; illustrated. Describes types of couplings, with insert of price-list.

Stoever Pipe Machines. Treadwell Engineering Co., Easton, Pa. Pp. 16; 8½ x 11 in.; illustrated. The different sizes of the machine are described, together with their component parts.—Advertiser.

Lopulco Pulverized Fuel System for Locomotives. Combustion Engineering Corporation, New York City. Pp. 30; 6 x 9 in.; illustrated. Among other interesting facts regarding locomotives equipped with the Lopulco system, are tests on different railroads where the locomotives have been equipped with this system.—Advertiser.

Obituary

Walter Scott Bogle, 70, pioneer Chicago coal merchant and one of the principal Indiana coal operators, died recently when he was stricken with apoplexy as he waited in his home at Chicago for his automobile to take him to his office. Mr. Bogle spent 55 years in the coal business, first employed by his father in a Chicago retail yard, then as his father's partner in D. Bogle & Son, later as an owner in King & Bogle, as the Chicago representative of the Delaware & Hudson Canal Co., as a factor in the Crescent Coal & Mining Co., and finally as the principal member of W. S. Bogle & Co., of Chicago.

Asa Lyman Hoyt, a local retail coal dealer and lumberman, age forty-five years, died recently after a lingering illness. Mr. Hoyt had been engaged in the coal business in Birmingham for a long while and had a wide acquaintance.

Samuel T. Oldham, superintendent of the Ebensburg Coal Co., died recently in a Colver, Pa., hospital. Death was due to pneumonia. Mr. Oldham first located at Osceola Mills, Pa. He has been in the coal mining business for 25 years. He became superintendent of the Ebensburg company in 1916.

Samuel M. Holtzman, of Ft. Wayne, vice-president of the Alaska Coal Co. died recently in a Ft. Wayne hospital as a result of injuries received a few days previous when run down by an automobile. He was 56 years old and had been engaged in business many years.

Coming Meetings

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Institute of Chemical Engineers will hold its summer meeting at Niagara Falls, Can., June 19-22, with headquarters at the Clifton Hotel. Secretary, Dr. J. C. Olsen, Polytechnic Institute, Brooklyn, N. Y.

Southwestern Interstate Coal Operators Association will meet June 13 at 519 Keith & Perry Bldg., Kansas City, Mo. Secretary, W. L. A. Johnson, Kansas City, Mo.

Illinois Mining Institute is holding its summer meeting June 8, 9 and 10 on the Mississippi River, the boat leaving St. Louis, Mo., on June 8. Secretary, Martin Bolt, Springfield, Ill.

Mine Inspectors' Institute of the United States of America will hold its annual meeting July 11, 12 and 13 at Chicago, Ill. Secretary, J. W. Paul, 4800 Forbes St., Pittsburgh, Pa. Announcement regarding headquarters will be made later.

COAL AGE

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Interpreting the Coronado Decision

OPINION on the meaning and effect of the decision of the Supreme Court in the Coronado case last week varies. The *New York Evening Post* thinks "No new principle is embodied in the . . . decision that labor-union funds are assessable for damages." The *Post* seeks to find some aspect of victory for the labor unions in this decision and locates it in the "ruling that they [the national unions] are not liable for local action which they did not incite."

The New York Times, on the other hand, considers this the "first case in which it has been held that unincorporated unions are responsible to the law," the Danbury hatters case having been the first in which it was held that individual unionists are answerable with their persons and property for unlawful conduct.

"It is sound social and legal philosophy which requires that responsibility go hand in hand with power," according to the *New York Journal of Commerce*, which adds: "There is nothing in the Supreme Court's stand which can be reasonably construed as discrimination against labor." The *Herald* concludes that "the very big thing is that everybody now knows where labor unions, labor individuals and all stand in respect of these laws of the nation."

Labor is far from satisfied with the decision. Mr. Gompers is credited with the statement that "this decision, which comes as a climax of decisions of the United States Supreme Court, . . . is a blow at the very foundation of the organized labor movement in America." For the first time in the history of federal decisions, he said, "the court has laid down the principle that a voluntary organization, not instituted for profit, is liable for damages for any act committed by one of its members, or groups of members, no matter how far related they may be in distance or supervision." Senator Lafollette issued a statement in which he pointed out that "the court went out of its way to change the law as it has existed in this country since the beginning of the government, that unincorporated associations, such as are involved here, could not be sued as an entity." Although the court set aside the money judgment against the union, he thinks the decision "is the most ominous in what it foreshadows for the future of the union-labor movement in this country."

Samuel Untermyer considers the decision merely an extension of the precedent in the Danbury hatters case and holds that it was "logically and reasonably certain that this principle would be extended to unincorporated labor unions." He advises labor unions now to incorporate to shield the individuals from personal liability, "except where the damages can be shown to have been the direct result of the acts of individual members, in which event the liability would be limited to them." He adds that he has never been able to understand the "intense hostility of labor unions to incorporation. Its terrors are purely imaginary."

The American Federation of Labor Weekly News Service of June 10 says editorially: "The Supreme Court of the United States has ruled that unincorporated trade unions can be sued. The decision means that big business has won its objective in its long campaign for trade-union incorporation."

The way is now open, it seems, for employers to hold union employees to their contracts. Suits for damages arising from strikes in violation of contract, such as have characterized the coal fields in the Middle West, may now be pursued with some prospect of holding the union itself liable. It has been a stock argument of the miners' union against incorporation that it would be unfair to hold it liable for acts of individual members the selection of whom is the consequence of employment by the operators and not necessarily of the union's choice. The answer to this, of course, is that if a man employed by the company is not a safe risk for the union, he need not be allowed to join. Policing the membership is within the power of the union if it will release its hold on the check-off and the closed shop. Otherwise it must hold itself liable for the acts of all who are forced to become members.

Will Retailers Jeopardize Public Confidence in Coal Industry?

THOSE retail dealers who have registered complaints with members of Congress against the Hoover plan of holding down coal prices are either without understanding of what that plan has accomplished already and is designed to do, or they are making a case before the public—their customers—prior to taking unfair advantage of the situation.

The plain fact of the matter is that after simmering throughout April, prices took a sudden precipitate upturn early in May. In manner of development and in steepness of ascent the rise was in every way comparable to that of May, 1920. Whereas at the instant of such a market, requirements for consumption and demand are real factors, the point is soon reached where fear and panic rule. Feverish buying in a wild scramble for coal in which price is disregarded and the bidding becomes furious is a certain consequence of the conditions and circumstances that surround a market as that now with us. When, in the middle of May, Mr. Hoover initiated his move to restrain prices, New England and the Northwest had not become infected with the fear of shortage. When these markets get out of hand, the lid is off. They were both on the point of breaking into the bidding contest when, through the intervention of the government, the tide was turned.

The steps so far taken to hold matters in check have in no wise reduced the consumption of coal or increased the output. The fundamental statistical facts are as they were when the market was starting its abrupt rise. What, then, has happened? Nothing, save that public confidence has been restored. It cannot even be held that the arbitrary prices are holding things down, for the market has been below the level set by Mr. Hoover. Production is well below actual consumption, which is increasing. Stocks are disappearing and the country is piling up a future demand for coal that will with difficulty be assuaged later when all the mines are in operation.

The position of those retail coal dealers, and of any jobbers and operators as well, who are attempting to sprag the wheels is calculated to destroy confidence in what Mr. Hoover is trying to do. Remember that Mr. Hoover is the first government official since Franklin K. Lane who has openly expressed his confidence in coal men, and Mr. Lane did not get away with it. Let Mr. Hoover fail in his efforts and the coal industry will face the unpleasant alternative of federal regulation in some form.

Fitting the Industrial Figure

THE art of fitting does not consist in making all parts of the garment fit snug. A little looseness in places meets needs which movement makes necessary; but where shall this fullness be?

Without professing to set the fashions we feel confident that the garments of the coal industry before long will be worn full where they have been loose and loose where they have been worn full. We have hitherto been generous in the supply of man power for mining and skimping in all other kinds of man power. But with the advent of the loader came the necessity for changes which our new-found fashions will reflect.

Walter Calverly senses this in his article this week. The locomotive is to be in attendance on the shovel—to subordinate its efficiency to the shovel's needs. The first consideration is not to have a low gathering cost but to provide for the prompt removal and placement of cars almost regardless of cost. However, it will be possible by the concentration thus resulting to make innumerable economies in operation, yes, even in main-line haulage.

The bulk of "mining work" is mining. If it is to be done by men who are paid by the day, the operation of mining must control transportation. Unfortunately, we have acquired a way of seeing transportation first, last and all the time. With a new method of loading coal and a new way of rewarding those that load it and with machines that entail interest and depreciation charges that exceed the wage costs a new viewpoint will be taken. In a sense we shall not be able to see the wages of the men because the interest and depreciation of the machine will hide all other considerations.

An illustration of the tendency to ignore labor cost is seen in somewhat exaggerated form in stripping operations by the casting method. Were it not for two considerations it would pay to continue stripping till the job was completed and the machine could be transferred to some other place. The operator could afford to overlook the temporary lack of demand for coal. In fact some do already with some limitations. The two unfortunate circumstances which prevent such steady activity till the stripping is done are that an area can be stripped only if a place to cast the displaced cover is provided and that unless the coal is removed with reasonable promptness that casting place cannot be found and stripping must soon cease.

How Much Is Invested in Coal?

CAPITAL investment in the bituminous-coal industry is found by the Federal Trade Commission, in a recent report to Congress, to be in round numbers one and two-thirds billions of dollars. The commission considers that without deductions for capital in excess land holdings the average is \$3.12 per ton of average production (533,000,000 tons) for the three years 1918-20. On the same basis the Census returns for 1919 show two billions of capital and an average of \$3.75 per ton. These figures are to be compared with those taken from the income tax reports of operators by the Internal Revenue Bureau for the Robinson Bituminous Coal Commission. For a representative portion of the total output (and this is all that the Federal Trade Commission data are presumed to cover) the Treasury's figures, which were for 1918, showed \$2.60 averaged for the output in that year, but calculated to the average tonnage for the three years used by the commission, \$2.85, the lowest figure of all.

That is, for 31 per cent of the total the Treasury reports \$471,000,000, or the equivalent of one and a half billions, against the Census two billions, and Trade Commission one and two-thirds billions. The Census is the only report that pretends to cover the entire industry, but its returns, as stated in the published reports, "do not show the actual amount of capital invested." This is explained by saying that although the data as to capital called for on the Census schedules exclude "securities and loans representing investments in other enterprises," the "reports received in respect to capital, however, at both censuses, have in so many cases been defective that the data compiled are of value only as indicating general conditions." The shortcomings of these data are explained as a consequence of defective or inadequate accounting.

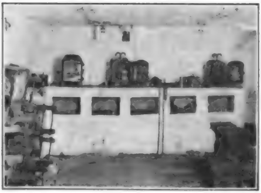
The apparent disparity between the averages and totals reported by the Income Tax Bureau and the Federal Trade Commission must be accounted for on other grounds. The tax bureau figures are a straight tabulation, presumably before extensive or complete examination and revision by accountants. The failure of proper accounting on the part of the reporting companies will be reflected here also, for this lack is notorous and is not confined to the coal industry; but the discrepancy is on the other side—the total is too low. Many a dollar actually invested in coal and plant does not show here because it is "plowed in" profits of former years and the books of the reporting company have not been corrected as allowed by the regulations of the government.

The Trade Commission made a serious effort at revision of returns and publishes a figure somewhat above that of the tax bureau and considerably lower than the Census. Both because it falls between the other estimates and because it is the result of a studied effort it is to be considered as the best figure for investment in soft-coal mining. It appears significant that despite the difference in totals as to investment, the commission and the tax bureau disclose the same figure of 18 per cent as the average return on investment for the year 1918, before deductions of federal taxes.

Safety and Economy Provisions at the Francis Mine

Overcast Has Explosion Doors—Underground Workshops Made Fireproof—Cars Dispatched by Telephone

By A. F. Brosky*
Pittsburgh, Pa.



THE Ford Collieries Co. has three operations—the Benjamin, the Berry, and the Francis mines—all located at Curtisville, Pa., fifteen miles northeast of Pittsburgh. Before the strike the first two developments worked six days a week, but the last named, the Francis Mine, has not operated since January. Advantage has been taken of the prolonged inactivity at this mine to put company men to work on a general renovation of the underground workings. Entries have been cleared of fallen rock, timbers replaced, where necessary, and work of a similar nature performed. All equipment has been completely overhauled, so that when a turn for the better does come, operation may not be interrupted by either petty or serious breakdowns. Thus the mine pumps, one at a time, have been brought to the surface to be carefully repaired in the machine shop.

A change in the ventilation system has been planned. In accordance therewith many new brattices and stoppings and one overcast recently have been erected. This overcast has at least one detail of construction not frequently encountered. This is the insertion of a doorway in one of the side walls. These walls are of concrete and 22 in. thick. They are surmounted by a roof formed by 40-lb. I-beams on the adjoining flanges of which rest ordinary rough bricks, laid with their long axes perpendicular to the beams, which are set on approximately 10-in. centers. The doorway is an opening of about 3 x 4½ ft. The frame is of wood, as are also the two doors, which are built up of 1-in. stuff. Mr. Mathewson, mine foreman, saw the advantage of providing easy access from one cross entry to the other. These doors, while sturdy enough to prevent leakage of the air currents, are frail enough to provide an easy vent for the force of an explosion, should one occur. Such a provision will do much to prevent the wrecking of the overcast. This might be completely shattered, if constructed rigidly.

PUMP BROUGHT TO SURFACE FOR REPAIR

The mine pumps were brought one at a time to the surface to be repaired. Note the guard made of heavy steel mesh bolted to a light band-steel frame by which the otherwise exposed gears are protected.

At a point convenient to the two main sections of the mine has been placed a small electrical repair and storage room, measuring approximately 20 x 30 ft. The closing wall, extending along the entry, is of hollow tile, plastered with cement both inside and out. The interior walls and coal roof also have been well plastered with cement, after which the whole interior was whitewashed to facilitate illumination. Entrance is gained through a steel door, thus rendering the room practically fireproof.

Work Benches Concrete and Wholly Fireproof

Poured concrete work benches extend along two sides of the room. These are provided with numerous bunkers or containers which may be used for storing equipment or parts. In this small shop minor electrical repairs are performed such as switches or telephones require. Possibly the greatest advantage this shop possesses is its storage facilities.

The stored material includes bonds, lamps, wires, switches and insulators. In many instances such material within a mine is kept in manholes or somewhere else convenient to the workmen. In this way it not infrequently is scattered throughout the entire workings, no record is kept of its whereabouts, and it sometimes is forgotten so completely that it lies unused until someone accidentally stumbles upon it. This repair room was built by a company man at odd times when other duties did not require his attention.

Fifteen telephones are placed at various points throughout the mine. At the main bottom is located a central telephone station or exchange in charge of a dispatcher, who directs all haulage traffic throughout the operation. The equipment thus controlled includes two 13-ton and eleven 6-ton locomotives. The telephones serve an additional purpose besides that of directing the locomotives—they provide a means for transmitting the daily records of each locomotive crew.

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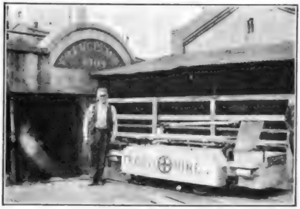
*Bituminous editor, *Coal Age*.



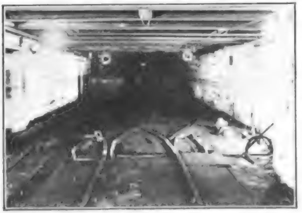
MINE AMBULANCE AT PORTAL OF FRANCIS MINE

Time is an important element in mine-rescue work. In itself a locomotive summoned by telephone from the motor barn and given right of way by telephonic dispatching service, this ambulance arrives promptly and removes the man from the mine with celerity and relative comfort.

As an example of this use, suppose that a large locomotive drops a trip of empties in one of the main sections and picks up a loaded trip. The motorman, before leaving, is required to telephone to the dispatcher, that he may be given right of way to the main bottom. Suppose that, soon after his departure, a gathering locomotive pulls into the storage track with a string of loads. The motorman of the smaller locomotive communicates with the dispatcher, giving the number of loaded cars he has run into the siding. The dispatcher then instructs the motorman of one of the main haulage locomotives as to the number of empties he shall leave at this parting and at other given points.

CAREFUL RECORDS ARE KEPT

The dispatcher makes a record, on a large tally board, of the number of loaded cars gathered and the number of empties dropped, together with the location of each trip of the respective motors. Records are thus kept of the individual trips of the several locomotives. Those of the two large haulage motors are made when they pull into or out of the main bottom. Each crew must make out a daily report covering its individual trips and the total for each day, to be checked against the report of the dispatcher. This latter is a duplicate of the tally values, totaled and presented in proper arrangement.



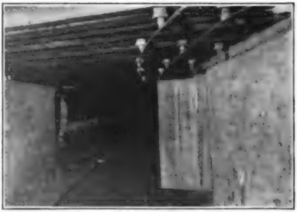
SHAFT BOTTOM ON SIDE FOR LOADED CARS

Here the arrangement is unusual. The double track on the load side extends but a few feet from the cage landing. Loads are weighed by an automatic self-recording scale. Cars are turned alternately to either cage by means of self-acting switch, the method of operation of which can be noted in the illustration.

At the slope bottom an emergency station of unusual construction is located. This houses a fire-fighting apparatus mounted upon a car truck, also a motor ambulance. The interior of the station, which is a clean-cut cement-plastered whitewashed and well-lighted room, contains nothing but the two emergency outfits together with the tracks upon which they stand. This barren but extremely orderly arrangement facilitates the quick departure of either or both of the two emergency machines in case of accident.

The company has one motor ambulance at each of its three mines. All three were built by the machinists and blacksmiths at the respective operations during spare time, or, rather, that not otherwise occupied. Each is built on the chassis of a small-tonnage locomotive. The body is constructed of light steel plate, cut to size, bent and riveted in the machine shop.

Such an ambulance is a highly efficient means of removing injured men to the surface with a dispatch not possible with the means commonly employed. The discoverer of an injured man hastens to the nearest telephone and calls the motor barn, which is adjacent to the emergency station. A crew to man the ambulance is always available during working hours, as the company employs a large number of men certified in mine rescue and first aid.



A CONCRETE OVERCAST WITH AN EXPLOSION DOOR

This door serves also as a means of communication with the cross-entries. Some place has to be found through which to pass from the intake to the return, and the door provides for this and as a relief valve in case of an explosion.

The ambulance is rushed to the scene of the accident, the proposed route of travel being cleared of traffic by telephone. The crew on reaching the injured man is able to administer first-aid treatment to the patient, as the supply of material for this purpose in the ambulance is complete. The injured man is then placed on a stretcher, lifted to the ambulance, and rushed to the surface.

AT THE PITTSBURGH (Pa.) experiment station of the U. S. Bureau of Mines, tests have been made in a small gallery to obtain comparative data as to the sensitiveness of methane and gasoline for the contemplated research as to the safety of motors in gasoline vapors. Permissible equipment, which has been tested by the Bureau of Mines and more carefully inspected by the manufacturer, rather than "flame-proof" equipment, should be required in all gaseous mines or gaseous sections of mines, and the use of any other should be discouraged.

Give Each Mechanical Loader Its Locomotive and Spend A Trifle on Haulage to Save Much on Mining Cost

Prepare Section of Mine for Exclusive Use of Shovel—Provide Parting for One Car or More, Sixty Feet or Less Behind Shovel—Mechanical Loaders Will Lower Almost All Costs, Even Main Haulage

By W. R. Calverley*
Pittsburgh, Pa.

FOR many years attempts have been made to devise a machine to load coal in the mines, thus effecting a saving in manual labor. It is noticeable, too, upon careful investigation, that most of the machines with which we have been experimenting have been the handiwork of men who were not mining men in any sense of the word, and this is largely the reason why the machines do not meet the expectation of their designers, for difficulties have to be overcome in putting these machines into operation for which men unfamiliar with mining conditions cannot possibly provide.

It would seem logical for anyone who is seeking to develop a machine to have the advice of, and to act upon the suggestions offered by, men who are thoroughly familiar with mining and who at the same time are interested in the development of a machine having possibilities of becoming a commercial success. There is a field for such machines, and I feel confident that ultimately we shall have a loader that will yield the desired results.

In the first place, we must set before us the problem of removing the loaded cars from the machine with the least delay possible and find a way to keep the machine as nearly as may be in continuous operation. I have seen several machines that would load a car up very quickly, but so many minutes would elapse in getting the loaded car away and the empty one in its place that the advantage was largely or even wholly lost.

Hitherto this has been the serious drawback to machine loading, and it must be eliminated before we can say that we have made any real progress in making the mechanical loader a success. Unless we can load a sufficient tonnage to meet all labor charges properly charged against the machine, in addition to other liberal allowances for upkeep, maintenance and interest on the investment, we cannot expect a loading machine to appeal to the industry generally.

To bring this about mining men must be prepared to help the designer of the machine to overcome the difficulties which have been responsible for the little progress so far made. When one introduces a mechanical loader into the coal mine, a section must have been prepared for it if we would expect to get the best results. By this I mean that a particular section should be prepared so that it can be worked entirely by coal-cutting machines and a mechanical loader, a group of places being provided—the number to be determined, of course, after a practical test has been made.

One cannot expect to work a mechanical loader successfully unless a locomotive is kept in attendance on this machine exclusively and unless the entry be kept entirely free from locomotives other than the one allotted to the loader.

One of the first things to remember will be that the locomotive must take a sufficient number of cars into the entry to clean up a working face so that when the last car is loaded they can be taken away, leaving the tracks clear for the loading machines to move quickly and uninterruptedly to the point where coal next will be loaded.

Passing tracks must be provided as near to the machine as economically possible, so that there will be the least possible delay in the changing of cars. After the car is removed an empty must be placed quickly in its place, so that the machine will be kept busy. This, in my judgment, can be accomplished by adopting

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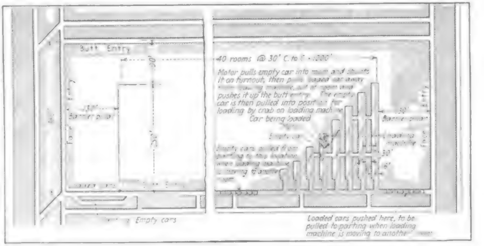
*President, Fayette Coal Corporation


Butt Entry
40 rooms @ 30' C. to C.
Motor pulls empty car into
it on turnout, then p
pushes it up the butt
car is then pulled into posit
loading by crab on loading mach
Car being loaded
Empty car
Barrier pillar
Loading machine
30'
Empty cars
Loaded cars pushed here, to be pulled to parting when loading machine is moving to anothe

Plan of Loading Machine Workings

The locomotive places the empties one by one in the nearby room turnout and hauls away the loads, also one by one, but a crab on the loading machine is relied upon to place the empty cars for loading. While the loader is moving from room to room the locomotive pulls out a string of loads to the parting and brings in a train of empties.

a method which is illustrated in the accompanying figure. It should appeal to everyone as being simple and yet one that takes us a long way nearer to the accomplishment of expeditious mining.

It is difficult to prepare a drawing which will show fully the many all-important factors by means of which the best results are obtained from the mechanical loader. Consequently, it is necessary to leave something to the imagination. My plan is to work the coal out in blocks or panels which in my judgment should be about 1,500 ft. long. I propose to turn off working places at the extreme end of the panel and to work the block on retreat.

About eight working places should be ample because, if the machine is what one has a right to expect, it could, after cleaning them all up, start to load up a succeeding cut in the same group of places. The rooms should be worked in regular rotation, so that when the working faces have been driven up the full distance the pillars can be extracted. In all probability it would be found advantageous to install a small hoist to handle the cars between the working faces and to the entry. It is important to keep a locomotive constantly in attendance upon the loading machine.

When the coal in the working place is loaded, the motor then would go on to the foot of the entry, where a passing siding has been provided. It would there discharge its load and start back up the entry with a train of empties. Thus the motor would have something to do while the loading machine was moving from one place to another.

It will then be noted that in the plan I have prepared a back switch is located in the working place just as near to the entry as it can be located. This should be long enough to hold one car. This switch, or parting, should be advanced with every 50 or 60 ft. advance in the room face. A contrivance would have to be put on the loading machine, so that it could pull the empty car under the conveyor of the shovel with the least possible inconvenience and delay.

COAL SHOULD BE SHEARED BEFORE BLASTING

In studying the question of mechanical loading I have been influenced largely by what I know of the Oldroyd undercutting and shearing machine. I feel confident that the coal should be sheared before shooting, for by this provision tight shots are eliminated and fully half the explosive that would be otherwise used in room and entry work is saved. At least one hole is dispensed with, reducing by this much the work of the shotfirer, who also is saved the time ordinarily expended in waiting for smoke and gases from the explosive to clear away.

Loaders will find it easier to commence work when the coal has been sheared than they do where a buster shot has been used. The danger of blown-out shots is materially reduced, the coal will not be shot to pieces, less damage will be done to the pillars and the roof, and the mine atmosphere will be clearer and healthier. Excessively large and numerous shots often so becloud the mine atmosphere that it is difficult to see the character of the roof, and the gases formed are surely injurious to health. For these and other reasons just recited I feel justified in attaching much importance to the shearing of the coal.

If loading machines can approach closely what their designers claim, many advantages will be made apparent when they are put into operation. The mines will be able to produce their present tonnage without being as extensive as they are now, dependent as they are today on manual labor for the loading of the coal. It is well known that the areas in which coal is being produced should be kept as small as possible. By such concentration less track need be maintained, fewer roadways have to be kept clean, and fewer timbers will keep the workings in a safe condition. By providing the workmen with mechanical means of loading they also surely are benefited, for thereby their otherwise laborious toil becomes reduced to an easy job with little else to do than to watch the machines performing their work.

The mechanical loader permits of: 1. Uniform and systematic advance. (a) Inequalities in the time and efforts of miners are overcome. With present methods a hard worker may have a place adjoining several slackers—the result is apparent. (b) Work may be concentrated on one or more places which it may be urgently necessary to speed up.

2. Simplification of main haulage, ventilation, pumping, etc.

3. In a new development rapid increase in daily production and the attainment of ultimate output in a comparatively short time. (a) Higher recovery is possible because of quicker working. Loading machines should be, and in all probability will be, worked in two 8-hour shifts. The first, or day, shift, of course, will work at capacity. The second, or night, shift would limit its output to the supplying of enough coal at the gathering points or on the tipple to insure such work for coal-handling equipment and the men in charge that no time will be lost at the beginning of the day shift while the first load trip is being made up.

Let me emphasize the need for making sure that the surface plant is of sufficient capacity for needs, present and prospective. It is better to have a few of the men who handle the coal idle part of the time than to have perhaps hundreds of miners waiting for cars or the clearing up of a congestion in traffic. This last is one of the important details in the laying out of the future mine where mechanical loading will be introduced.

How to Prevent Coal-Pile Fires*

BY J. E. WILLIAMS†

Waterbury, Conn.

THE secret of preventing coal piles from catching fire by spontaneous combustion lies in the manner of building up the piles. Two simple rules that, if followed, will go a long way to prevent fires are: (1) In unloading coal with buckets drop the load in a bulk.

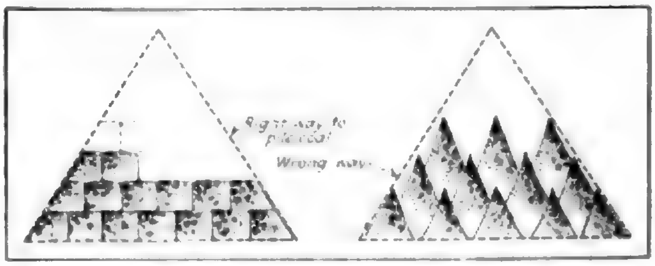


FIG. 1—METHOD OF STORING COAL

Right—Coal piled in shape of cones separates the fine and coarse. Left—When piled in layers the mixture is kept together, preventing air filtering through.

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*Electrical World, June 3, 1922.

†Chief engineer, The Chase Companies.

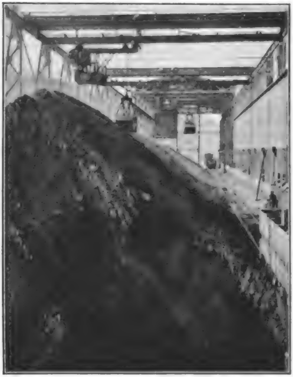


FIG. 2. STORAGE PIT CONTAINING 7,000 TONS

This pile is 500 ft. long by 60 ft. wide. Though in the general form of a cone, it has been made up by a series of dumpings, the bucket being so placed and opened in each case that the coal falls in a mass and does not dribble out into a small single-bucket cone. In another pile near this 10,000 tons is stored.

Don't let it trickle out into cone form. (2) Build the pile in flat layers.

In building up the layers of coal proceed as if building a brick wall. Drop the first load flat in a bulk, lay the next load close to the sides of it, the next to the side of that, and so on until one layer is completed with a flat top. This keeps the mixture of fine and coarse coal together.

If the coal is dropped from the bucket in cone shape, the heavier coal rolls down the sides of the pile, leaving the fine coal in the peak. The cones that are formed will have the heavy coal at the bottom and sides, through which air will enter and may set the whole pile on fire. By building the coal pile in layers this separating of the fine coal and of the larger pieces of coal is prevented, and the air will not filter through so easily. The right and the wrong ways of coal piling are shown in Fig. 1, where on the left, the coal is dumped quickly, thus preventing it from separating with the large coal at the bottom and the fine coal at the top. On the right is shown the formation of internal cones produced by improper piling.

Some coal will catch fire no matter what precautions are taken. This indicates excessive sulphur and iron. I have seen a ray of sun through the roof ignite this kind of coal, but fortunately there is very little of it on the market.

Once the coal pile is built for storage, rehandle the coal as little as possible. For use take a layer off the top and build up as before, not forgetting that the secret lies in keeping the surface flat and avoiding internal cones.

Chart That Solves Pipe-Capacity Problems

By W. F. Schaphorst
Newark, N. J.

ENGINEERS often desire to ascertain quickly the velocity with which water will travel through a pipe of given diameter. They often want also to know the number of cubic feet of liquid or gas that will flow through it in one minute, the number of gallons of liquid which will pass through it in a like time or the number of pounds of water it may be expected to convey.

All these quantities are dependent, of course, upon the size of the pipe, and as the sizes in common use vary, standard pipe not being exact in internal diameter and extra heavy pipe differing also, it usually is necessary to search through tables and make lengthy calculations before arriving at a satisfactory result. And then, after a result has been obtained, one can never be certain that it is correct.

The accompanying chart solves all of these matters in a simple manner. The best way to explain the use of this chart is to solve a problem by its aid. First, it will be observed that three sets of figures are given in connection with the left-hand column, which I have called column A. The first set, marked "No. 1, Standard," gives the actual internal diameters of standard pipe. This shows, for example, that the internal diameter of a 1-in. standard pipe is somewhat greater than 1 in. The set of figures marked "No. 2, Exact," gives exact internal diameters. Thus, if we have a pipe the internal diameter of which is exactly 2 in. as used in the problem to be cited below, we use this column of figures. The right-hand set of figures, marked "No. 3, Extra Heavy," gives the actual internal diameters of extra heavy pipe. It shows that the inside diameter of a 1-in. extra-heavy pipe is less than 1 in.

Problem of Capacity of Two-Inch Pipe

Now, for the example: How much water is passing through a pipe the internal diameter of which is exactly 2 in., the velocity being 2 ft. per second?

Locate the line corresponding to a 2-in. diameter in column *A* over the word "exact" and, from its point of intersection with the vertical, project a straight line through the 2-ft. per second point in column *C*, as shown by the dotted line. This intersects column *B*. From this point of intersection with column *B* run a straight line horizontally across the chart to the corresponding point of column *G*, also as shown by a dotted line. The intersection of this horizontal line extended from column *B* to column *G* gives simultaneously the desired result in three columns—namely, *D*, *E* and *F*. It shows that approximately 2.6 cu.ft. per minute is flowing through the pipe (the exact amount is 2.615 cu.ft.). It also shows that somewhat more than 19 gallons per minute is passing through the pipe (the exact amount is 19.58 gallons) and that the pipe is carrying about 165 lb. of water per minute (the exact amount being 163 lb.).

This chart is fairly accurate, certainly sufficiently so for all practical purposes. It is evident upon studying it that if the pipe were a 2-in. standard pipe, instead of being exactly 2 in. in internal diameter, the horizontal line from column *B* to column *G* would be slightly lower and the three quantities would be slightly greater.

On the other hand, it is evident also that if a 2-in.

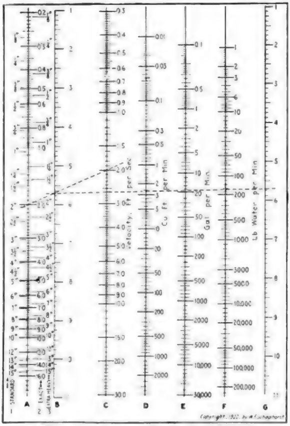


CHART FOR DETERMINING PIPE CAPACITY

The dotted lines show the method of solving the problem of the capacity of a pipe of exactly 2 in. internal diameter with water running at 2 ft. per second. One line joins 2 in. in line *A* with 2 ft. in line *C* intersecting line *B* at a point from which a line is drawn to a similar figure in line *G*. This line crossing lines *D*, *E* and *F* shows on their scales respectively the number of cubic feet, the gallons and the tons passing per minute.

extra-heavy pipe were used instead of the 2-in. exact, the horizontal line from column *B* to column *G* would be raised slightly above its present position and the three quantities would therefore be somewhat less.

Inversely, if any quantity in column *D*, *E* or *F* is known and it is desired to determine the velocity per second flowing through the pipe, this same chart can be used for this purpose with equal ease. First run a horizontal line from column *B* to column *G* through the known point and then from its intersection with column *B* project a straight line to the known pipe diameter. The intersection of this latter line with column *C* gives the velocity of flow in feet per second.

On the other hand, if one wishes to select a pipe size, knowing any one of the quantities in column *D*, *E* or *F* and having decided upon the velocity of flow, the procedure to be followed is quite evident. It will be noted also that this chart can be conveniently used for conversion. For example, how many gallons are there in 2.6 cu.ft.? The dotted horizontal line already drawn shows that the number sought is slightly over 19, which is equivalent also to about 165 lb. of water. This chart gives a visual illustration of the relationship existing between pipe sizes—standard, exact and extra-heavy. By using this chart one can quickly "read off" the actual internal diameter of a standard or extra-heavy pipe.

In range this chart has been made sufficient to cover almost any problem dealing with water. The standard pipe sizes included vary from ⅛ in. to 15 in. and the velocities from 0.3 to 20 ft. per second.

Should anyone prefer to use formulæ rather than this chart, either for solving a problem directly or for checking the result taken from it, the following are the formulæ on which it is based:

$$Q = 2.45\, d^2v$$

where Q = gallons per minute flowing;
d = internal diameter of pipe in inches;
and v = velocity of flow in feet per second.
The cubic feet per minute $= 0.327d^2v$ and the pounds of water per minute $= 20.4d^2v$.

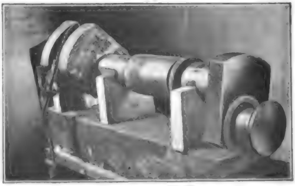
Welding Job Saves Union Pacific Coal Co. Nearly a Thousand Dollars

IN THE accompanying illustration is shown the 5-in. crankshaft of a mine pump belonging to the Union Pacific Coal Co. and installed in one of the mines at Cumberland, Wyo. This shaft broke clear across at the point indicated. The pump was accordingly dismantled and the shaft lined up and clamped securely in a supporting frame as shown. Here the break was repaired with an electric welding set. Since being returned to operation it has given excellent service.

This repair cost about $50. It is estimated that had the welding outfit not been available and had it been necessary to procure a new shaft, the total expense would have amounted to nearly if not quite $1,000. Furthermore, by welding, the pump was back in service in a short time, whereas a long delay otherwise might have been entailed.

This firm welds electrically all broken car irons and coupling links, renews the ends of boiler tubes, repairs broken shafts, and performs numerous other miscellaneous jobs by the same means. The officials are sometimes inclined to wonder how they got along without the electric welder.

At first considerable trouble was experienced in procuring competent operatives to use the outfit. Three or four itinerant welders "happened along" and were given employment, but proved to be tyros and would-bes rather than sure-enough welders. It was decided, therefore, to break in some of the regular employees and encourage them to perfect themselves in the manipulation of the apparatus. This, therefore, was done, with results entirely satisfactory to all concerned.



BROKEN CRANKSHAFT ELECTRICALLY WELDED IN UNION PACIFIC COAL CO.'S SHOP

This weld was made by some of the regular employees of the Union Pacific Coal Co., who have been taught the art of electrical welding and so can save the coal company from calling in outside help.

Stripping Coal in Russia at Fifty Degrees Below Zero

Engineer of "Great Bear" Country Describes Difficulties of Loosening Overburden and of Loading and Dumping It—Both Steam Shovels and Men Had to be Protected Against Cold and Wind

AMERICAN engineers would hesitate to strip coal at a time when winter gales such as blow in Russia sweep over the ground, for the mercury frequently hovers around 50 deg. below zero, freezing everything to adamant. But in parts of Russia the need for fuel requires that the attempt be made, so in spite of obstacles, steam shovels and draglines, winter and summer alike, are digging coal in the Ural region. The difficulties of the task and how they were overcome were described in *Gornoji Djilo*, the journal of the Mining Board of the Supreme Council of Public Economy, by Saitzevsky and translated by George A. Moskchansky, an engineer. The translation runs thus:

For a long time the excavating work in northern Russia began in April or May, according to the location and readiness of the ground to thaw out, and lasted until November, and sometimes only until October. Thus the work was prosecuted from five to seven months, or an average of about half a year. The rest of the year excavators were not in use, though in southern Russia they work the whole year long.

During the present period of national reconstruction the demand for excavators continually grew and as it has been impossible to obtain these machines abroad for the last three years and as they are not built in Russia, it seemed absolutely necessary to utilize the machines on hand to the utmost, making them work not merely half time but throughout the year. Many experts in coal mining questioned whether winter work was practicable, especially in the northern parts of Russia.

MICHIGAN MINES STRIP ORE IN WINTER MONTHS

In foreign technical literature there are descriptions of the stripping of coal or ore by excavators during the winter. Thus, in the March, 1918, issue of the *Engineering and Mining Journal* an article describes in detail how ore is stripped every winter near Lake Michigan so that it may be loaded early in the spring, ready for shipment to the plants as soon as navigation opens.

It was known also that during the building of the Murman R. R. excavation continued during the winter, the military necessity requiring that the work be speeded as much as possible. This work was performed in an extremely severe winter, not differing much from the climate of the Urals, with temperatures of —58 deg. F. This suggested to me that the excavating work in Cheljabinsk coal mines could be extended through the winter months. This project has been accomplished and in the strip pits of this northern country, three steam shovels of American manufacture have been successfully used. The ground consists of a sandy clay. The depth of the cut where the Bucyrus works is about 12 ft., the shovel standing on the coal and loading the overburden into cars standing on track laid on the surface—that is, at a height of about 34 ft.

The shovel moves from north to south along the eastern side of the cut and the two Marions move from south to north along the western side while going deeper by steps or banks on an inclination of 1 per cent. The material is lifted only a few feet, the booms of the shovels being short.

In December, 1920, the Bucyrus worked steadily by day and by night, loading from 800 to 1,000 long tons in 24 hours and uncovering between 700 and 750 gross tons of coal. The Marions for a while performed a preparatory work, gradually going deeper in four cuts, each 4.8 ft. deep, and having behind them the pit about 19½ ft. deep. One of them is now almost at the beginning of the cut, another one in the middle digging a low bank, consequently their work is not efficient, but after reaching the depth of 16 to 19½ ft. they will scoop a full dipper load at each movement, whereas they now fill the dipper only by making many strokes. With banks of the regular height they will move in 24 hours not less than 1,635 cu.yd.

DRAGLINES ALSO WORKING IN RUSSIAN WINTER

Beside the excavators just mentioned a Bucyrus No. 14 dragline excavator is working in the southern cut of the Cheljabinsk mine. Beginning its work without a preparatory blasting of the frozen surface the bucket of the excavator broke, temporarily suspending the operation of the machine. It must not be thought that work cannot be done with this machine during winter months, for it can be successfully operated if the frozen top crust is first thoroughly prepared by blasting. To prevent the cut from freezing, the work must be continuous.

Winter work is not insuperably more difficult than work in the summer. If it is prosecuted in three shifts the ground is not given time to freeze up, and the machine has difficulty only in removing the top crust. To facilitate its digging the crust is prepared by blasting a number of holes drilled in checker order 2 ft. 4 in. from each other and 27 to 35 in. deep. The holes are charged with soft dynamite, each charge being 0.112 lb. They are drilled at an angle of 45 deg. to the surface, with the slope toward the bank.

BUCKET READILY SCOOPS UP FROZEN LUMPS

After the holes are exploded the frozen crust is cracked in all directions, and the dipper of the excavator without much difficulty scoops the upper part of the bank, which readily breaks into lumps.

Preparations are being made to drill the blast holes with air drills. When the work is done by hand a workman in one shift with the twist drill will drill ten holes. It seems difficult to explain how so much work can be done until it is stated that the upper layer consists of soft black soil. Where, as in some places, the top consists of clay, air hammers have to be used.

When the ground is thus prepared for excavation the work is made relatively easy, so that the resistance of the ground to the shovel is little more in winter than in summer. The main difficulty is to protect the intake and exhaust steam pipes from freezing, to supply the machines with water, and to protect the workmen from cold and wind.

In Cheljabinsk mines, on account of certain misunderstandings and friction, the winter work in 1920 was started almost without preparation, the precious months of the autumn being allowed to pass by without anything being done. Operations were begun in the latter part of November, when cold, windy weather came on, the temperature falling to —50.6. At the start the steam in the pipes condensed rapidly, and the pipes, cylinder heads and valve chests froze up almost instantaneously whenever work stopped. The pipes, cylinders and other parts of the machine where water was likely to gather, had to be covered with insulation. The machine was covered with a wood shed, but this proved an unsatisfactory protection.

To supply water for the shovels was an unusually difficult task. As in coal mines the water is very hard, it usually was delivered in sheet-iron tanks, but in winter these proved to be useless, for the valves froze up when the water was shut off. The Omsk R.R. furnished the excavators with fourteen box cars each containing two water tanks of an aggregate capacity of 2,650 gal. These box cars are heated by stoves. The discharge valves are inside the cars and consequently do not freeze. Thus protected the tanks give satisfaction. The feed water for the boilers is brought in these tanks fourteen miles from a point on the Omsk R. R.

For these cars a separate track is laid alongside that provided for the equipment on which excavated material is loaded. Water is delivered to the excavator tanks through a 2½-in. hose.

SHOVEL LOST MUCH TIME WAITING FOR CARS

Success in excavating work depends largely upon the track facilities and the prompt arrival of cars. The efficiency of the excavators during the last working season was from 15 to 40 per cent of normal and the latter figure was reached only lately. This lack of efficiency can be laid almost exclusively to the unsatisfactory condition of the service tracks. The machines were frequently idle, sometimes as much as 75 per cent of the working time being lost waiting for the locomotive and cars, which were delayed by reason of derailment of loads and from other causes.

The Omsk R. R. is greatly interested in the production of this coal, being itself the chief consumer of the product. Consequently it took the shipping part of the business in its own hands, placing in each department responsible agents appointed by the department manager of this division of the line. As soon as this was done the machines were enabled to keep busy, the tracks and cars being kept in good order and locomotives arriving at stripping machines as they were needed. This also aided the winter work materially. Had it not been that the Omsk R. R. took over the hauling of the trains and the supply of water, the removal of snowdrifts, the thawing of the tanks, and other haulage and water-tank equipment difficulties, winter work would have been impossible.

In order to avoid the freezing up of the banks the shovels were kept as far as possible in steady operation, stops being made for only short periods when it became necessary to make repairs, replace broken parts and do other necessary work. To this end the pit was operated for three shifts despite the fact that less is done at night than can be done during the day.

Care should be taken to light the pit and dumping place adequately. Incandescent electrical lamps are not altogether convenient for this purpose. When they are placed on the machine itself they are subject to much vibration and burn quickly. It is therefore more convenient to erect posts behind the machine and mount them on these.

It was found important to provide the excavator gang with clothing of unusual warmth. It was not sufficient to provide them solely with the usual fur coats and felt boots. Cotton underlined trousers and coats and the felt caps of the new Red Army style were provided. This headgear protected the back of the head, the ears and even the cheeks.

CANNOT WORK FULL EIGHT HOURS IN COLD

This type of equipment though light, is warm and does not hinder the free movement of the men in the excavator gang. Yet even in garments such as this it was impossible to work continuously for eight hours in the cold and wind, and the gang, consisting of an engineer, a trackman, an oiler and a fireman, had to be reinforced by a second engineer and trackman, their work being the most responsible and requiring special activity. It is also the most uncongenial work, for the trackman is not protected in any way from the wind and cold. Consequently it is essential that during the shift he have an opportunity to warm up at the boiler of the excavator shed.

Snow fences must be erected to prevent the accumulation of drifts. At the beginning of the work the trench filled with snow, the dipper scooped up snow with the ground and this formed with the clay a sticky mass, which adhered to the dipper so that it could not be discharged. Consequently the work had frequently to be stopped while the dipper was cleaned by hand.

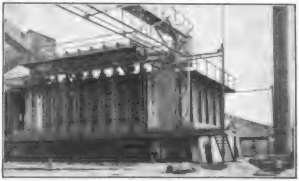
The unloading of cars at the dumping place also was a difficult operation. The cars were loaded in from 25 to 30 minutes and the dumping took about an hour Each flat car required about five or six workmen to unload it, and on the twelve flat cars of a single train about fifty or sixty men were employed. These workmen throughout the shift ride between the cut and dumps, the distance being about 1.8 miles. They are exposed constantly to the cold and wind, as the dumps are located where the ground is level and unprotected and where consequently the wind has a clear sweep.

Dump cars have as yet not been provided, but they are under construction and probably soon will be in operation. If not, then the unloading should be done by a plow. Thus unloaded the work could be done in not more than five minutes instead of, as at present, in an hour. This will reduce considerably the number of work trains and decrease to a large extent the number of men performing this exacting work in the bitter cold.

COAL MINING COMPANIES are rapidly substituting permissible explosives for other classes of high explosives and for black blasting powder, according to the U. S. Bureau of Mines. By so doing they are rendering valuable aid to the nation-wide effort to make mining a safer occupation for the 750,000 men employed in American coal mines. In 1912, just ten years ago, only 8 per cent of the explosives used at coal mines was of the permissible class; in 1921 the percentage had increased to 18; and in March, 1922, it was 21. The steadily increasing rate of use of permissible explosives is shown by the following tables of percentages: 1912, 8.03; 1913, 9.44; 1914, 8.88; 1915, 10.32; 1916, 11.84; 1917, 11.08; 1918, 13.08; 1919, 15.21; 1920, 14.96; 1921, 17.90; March, 1922, 20.80.

Piette Coke Oven Consumes a Little Over One-Third of the Heat in Its Gases

By Hector Prud'homme*
New York City



Makes Almost Seventy Per Cent of Coal into Coke, About Five and One-Half Pounds of Ammonia, Seven Gallons of Tar and Three and One-Half Gallons of Benzine—Long Oven Life Anticipated

The Piette type of coke oven was built experimentally for the first time in the United States by the Franco-Belgian Coke Oven Corporation of Brussels, Belgium, at the Carondelet coke-oven station of the Laclede Gas Light Co., St. Louis, Mo. This construction of eight ovens was made for the purpose of a demonstration preliminary to the organization by the Franco-Belgian Coke Oven Corporation of the Belgian American Coke Ovens Corporation. Minute tests have been conducted on these ovens by the Laclede Gas Light Co. during 30 consecutive days and the ovens have been in regular operation for over 14 months. The Franco-Belgian Coke Oven Corporation has more than 1,500 modern ovens in commercial operation in several countries in Europe. However, the construction in St. Louis, was experimental and, therefore, limited to eight ovens.

The Piette oven is of the horizontal type, with vertical flues, transverse regenerators and reversing arrangement. The regenerator chambers run the whole length of the battery at right angles to the heating walls and oven chambers. This intercrossing of the walls is designed to give a maximum of stability to the whole structure. Arrangements are provided for expansion when the ovens are heated, so that no fractures will occur to interfere with the proper working of the ovens.

Although arranged in longitudinal chambers, the regenerators are actually of the transverse type, and the products of combustion cross through the checkerwork in a direction parallel to the center line of the oven and travel longitudinally only after arriving in the free space of the secondary chamber. The total resistance is thus lowered to 0.2 or 0.23 in. of water-gage, instead of the 1.2 in. usual in longitudinal regenerators. In this way the pressures in the oven chambers and heating flues are more nearly equalized, and a maximum of gas-tightness and a maximum recovery of by-products is assured.

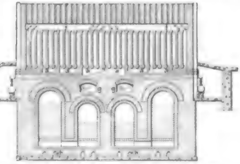


FIG. 1. SECTION THROUGH HEATING FLUES

The regenerators run longitudinally but the gases do not travel in that direction but at right angles to it because the resistance of a long regenerator is considerable and one that is shorter will do the work satisfactorily. The longitudinal chamber is structurally stronger.

While not essential, the use of a fan for the air supply will tend more nearly to equalize the pressures between the oven chamber and the heating wall, and prevent the passage of gases in either direction as the ovens become older.

Regulation of Gas and Air to Heating Flues

The center-line of the battery divides the heating wall into two symmetrical parts, reversals being made from one half to the other. The space between the sole flues of each half is divided into four chambers *a* (Fig. 1), each fed by an individual gas supply pipe provided with its regulating cock and distributing the gas to four vertical flues. Independent of these cocks, there is also a control cock common to each half-wall. The air for each half is regulated by a damper *r* (Fig. 2), at the inlet to the sole flue *s* (Fig. 2) of the oven adjoining. The area of the air nozzle for each burner is determined with great care.

This oven may also be constructed, if desired, by arranging the reversal from one group of two or three flues to the next group of two or three, by slightly modifying the method of coupling the vertical flues with the sole flues, and using suitable reversing cocks.

The air for combustion is drawn through flues *g* (Figs. 1 and 2) to absorb the heat radiated downward from the sole flue, as well as through air ducts *h*, to take up the heat radiated downward from the regenerators. Thus preheated, the air arrives at the reversing valve and is there directed alternately into one or another of the secondary regenerators.

The several means of control, to which there is easy access, enable great regularity of heating to be obtained, at a high, even temperature. The reversal of the draft and the operating of the burner valves are carried out by the working of a single lever.

To make the operation of the oven easy and certain, sight-holes for the examination of every part are provided, one for each vertical heating flue on top of the ovens, one in each half of the sole flue *s*; one in each horizontal flue *t* (Fig. 1) in the heating wall; one in each regenerator chamber. Those who are superintending and controlling the ovens have thus every facility for the even heating of the battery at any speed.

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*Vice-president and general manager, Belgian American Coke Ovens Corporation, [illegible] Broadway, N. Y.

The dimensions of the eight ovens installed at St. Louis are as follows:

Height of oven chamber	9 ft. 10⅝ in.
Length between doors	37 ft.
Average width	19⅝ in.

A 30-day test was begun after the ovens had been operated for 3 months. The figures in Table I show in more detail the results obtained.

The mixture of coal charged in these ovens during the 30 days of tests was as follows: 65 per cent of high volatile coal (Elkhorn from the Consolidation Coal Co.) and 35 per cent of low volatile coal (Pocahontas from the Cleveland-Western Coal Co. of West Virginia). The average analysis of this mixture was:

	Per Cent
Moisture	4.43
Volatile	29.06
Fixed carbon	61.37
Ash	5.14
	100.00

Tests of the coke yield and researches as to its nature were made by weighing daily the load of one oven, which was then screened and the samples submitted to laboratory tests. The results are given in Table I. The screening was done on an inclined 2½-in. roller grizzly screen.

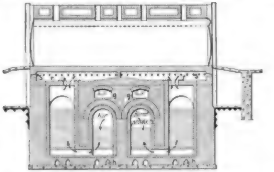

FIG. 2. SECTION THROUGH OVEN CHAMBER

This illustration shows the course of the gases from the sole flue through a regulator into the two regenerator chambers and the course of fresh air through two regenerators and a regulator into the far half of the sole flue. The movement is parallel to the center line of the oven and not longitudinally, but the longitudinal flue is favored because the long wall holds the oven together.

These figures show that the yield in available B.t.u. would be, after deducting the B.t.u. needed for heating the ovens, 60.9 per cent of the total quantity of B.t.u. produced. This already very satisfactory proportion does not, however, represent the real power of this system of ovens.

A small number of ovens can, of course, not give the same yields as a bigger battery, of say fifty or sixty or more ovens of the same type. In the case of a big battery the gas used for the heating of an end-wall, which was found to be more than half the amount used on one oven wall for intermediate flues, is distributed over a larger number of ovens and as a matter of course over a larger quantity of the coal distilled. If the heat used in one end-wall is distributed over a battery of fifty to sixty ovens, the average number in a modern battery, the reduction in B.t.u. consumed in comparison with a battery of eight ovens is about 6 per cent. Taking this into account, the calorific balance sheet of the Piette ovens working under the conditions described above at St. Louis is as follows:

	Per Cent
B.t.u. produced, 3,301.7 per lb. of coal	100
B.t.u. in the surplus gas, 2,088.4	63.25
B.t.u. consumed in the heating gas, 1,213.3	36.75

This consumption is claimed to be the smallest yet realized in the United States considering the conditions imposed by the tests.

TABLE I—RESULTS OF TESTS

A.	Ovens and coal:		
	Number of ovens charged and pushed		282
	Average coking time		20 hr. 18 min.
	Average load per oven		26,770 lb.
	Total quantity of coal charged in 30 days		7,549,400 lb.
	Average quantity of coal charged in 24 hr. per oven		31,455 lb.
	Average temperature of the smoke at the outlet of the heat regenerators corresponding to 3.8 per cent oxygen or an excess of 25 per cent of air		624 deg. F.
B.	Coke:		
	Total yield of dry coke calculated on coal as charged, per cent		69.19
	Proportion of foundry coke in total coke		38.15
	Proportion of other grades of coke		61.85
	Average analysis of the total coke obtained, per cent:		
	Moisture	1.94	
	Ash	6.77	
	Fixed carbon	90.33	
	Volatile matter	0.96	
	Specific gravity:		
	Apparent	0.973	
	Real	1.906	
	Shatter test	55.57	
	Porosity:	Per Cent	
	Coke substance by volume	51.03	
	Air spaces by volume	48.97	
	Total quantity of coke produced in 24 hours in one oven, lb.	21,764	
C.	Heating gas:		
	Volume of gas burnt during the 30 days in cu.ft. at 30 in. pressure and 60 deg. F.		20,332,000
	Volume of gas burnt per lb. of coal charged		2.693
	Heating value of this gas (B.t.u. per cu.ft.)		479.3
	Consumption in B.t.u. per lb. of coal charged		1,290.7
D.	Gas produced and B.t.u. available:		
	Total volume of gas produced during the 30 days at 30 in. and 60 deg. F., cu.ft.		44,159,000
	Volume of gas produced per lb. of coal charged in cu.ft.		5.849
	Average calorific value of this gas (B.t.u. per cu.ft.)		564.5
	Total quantity of B.t.u. available per lb. of coal charged (non-debenzolized gas)		3,301.7
	B.t.u. (surplus) available per lb. of coal treated		2,011.6

Average analysis of the gas produced:

	Per Cent		Per Cent
CO_2	1.7	CO	6.1
C_nH_m	3.4	CH_4	29.8
O_2	0.4	N_2	6.8
H_2	51.8		

Average specific gravity at 30 in. mercury and 60 deg. F. 0.39. Yields of byproducts per ton (2,000 lb.) of coal carbonized:

Ammonia (NH_3), lb.	5.63
Tar, dry, gal.	7.01
Benzene (product distilling below 200 deg. C.), gal.	3.42

The most important characteristics of the Piette oven are:

1. The carbonization chamber and the whole structure are perfectly tight, as was demonstrated during the St. Louis tests. This, together with a perfect regulation of the heating and the excellent heat regeneration qualities, has permitted the extraction from the coal of the maximum of byproducts.

2. Short-circuits in wall flues have been done away with through the reunion, in two continuous series, of the upward-flame and downward-flame flues. This arrangement acts favorably in the exchanges of heat with the consequence that the work of the regenerators is facilitated.

3. The distribution of the gas in each oven wall by several compartments fed by individual tuyeres, each supplying the gas to three or four flues, permits the regulation of the quantity of gas admitted at every point of the oven in such a manner that it takes into account the effects of the taper and the cooling from outside.

4. The use of fixed regulating sections for the entrance of the air under the soles and the outlet of the

burnt gases through the top of the vertical flues, which sections are calculated and confirmed by practice, makes the use of sliding bricks unnecessary. The placing of such sliding bricks is always very difficult for the heater who has charge of them, and it has been found many times that these small bricks remain stuck after some time, which fact prevents a first-class regulation of the batteries where such device is employed. The unremovable regulation sections of the Piette ovens are superior, because they need no adjustment of any kind and are not exposed to the consequences of the whim or indifference of the heaters. More uniform heating of the oven walls is obtained, as was shown under every kind of running conditions at the new battery at the Laclede Gas Light plant.

5. The fact that the longitudinal regenerators work transversely, and thus establish an automatic regulation of the temperature of the combustion air, assists materially in the equalization of the heating of the several ovens of the battery, an advantage which does not exist in the ovens having individual transverse regenerators. The uniformity of the temperature of all the ovens of the battery which was noted daily at the St. Louis plant was a feature of the tests.

6. The two transversal-conjugated-regeneration galleries on each side of the center line of the battery allow (through a convenient regulation of the sections of the communicating openings existing between the primary gallery and the secondary gallery) for compensating the effect of the drop of pressure in the outlet gallery for the combustion products and for establishing correspondingly a uniform working of the depression for all the ovens. These sections are so calculated and the quantity of checkerwork placed in the secondary gallery is such that they are perfectly sized for the products going out and in the following period for the air coming in through them.

7. The aërating galleries *g* between the soles and the secondary regenerators as well as the galleries *h* under the heat regenerators assure a convenient cooling of the combustion products and a saving of radiating heat through a reduction of this radiation. These advantages were clearly shown during the tests referred to in this article, the air being heated to 200-280 deg. F. before entering the regenerators proper.

8. The stability of the ovens is remarkable. The regenerators are longitudinal to the center line of the battery and therefore perpendicular to the center line of the oven-walls and the arches of the ovens. This intersection of the walls and the ovens makes for a maximum solidity of the mass of the battery. Then the expansion of the linings and of the arches of the regenerators, as well as of the flues connecting the primary regeneration galleries with the sub-sole flues, is rendered completely independent of the general sustaining mass of the battery. The result thereof is that the refractory material which constitutes the sole-oven walls and the ovens are built on an absolutely rigid monolithic block which cannot be deformed. Such a disposition is remarkably advantageous with the silica bricks so extensively used in the United States which expand so much. The system in which the oven walls proper of the oven are placed on regenerator walls, of which they are a part, can evidently not realize a similar tightness. The unequal temperatures which are found from the foot of the regenerator walls to the top of the oven walls justify unequal expansions from level to level, which cannot but cause cracks.

9. The ovens are easily operated and watched. As explained above, sight-holes are placed all along the passages of the flames and the gases, which are thus made accessible everywhere. The sight-holes placed at the end of the primary regenerators permit an inspection of the top of the checkerwork for the whole length of the battery. The progress of the heating is easily followed by heat coloration and general aspect of the ensemble. This inspection shows whether any oven-wall is being insufficiently heated, due, for instance, to an accidental obstruction of a cock or of a gaspipe.

Boiler Feed Pumps Most Reliable When Driven By Steam*

By C. M. Evans

St. Louis, Mo.

When steam-driven pumps are used in boiler feeding they are noted, regardless of their type, for power-plant men to consider them favorably in spite of their admitted shortcomings. Although steam-driven machines of this kind are well known to be less efficient than those either mechanically or electrically actuated, they may be operated whenever steam is on the boiler, whether any other prime mover is running or not. This characteristic is important because there are many occasions when the prime mover or generating equipment is inoperative, yet it may be highly desirable to force water into the boiler. Consequently many practical consulting and operating engineers will install only steam-driven apparatus for boiler feeding.

Where an electrically driven pump is employed its operation depends upon that of another piece of equipment—the generator. Another link thus is added to the chain of operation. If because of accident or for some other reason the generator is shut down, a motor-driven feed pump is useless.

The disadvantages of the mechanically or electrically driven feed pump, as just enumerated, vanish if a steam-actuated unit is installed as a standby. Where such an auxiliary is used—and such a one should be in every plant—the more economical motor or mechanically driven machine may be used during normal operation and the steam-actuated unit employed in emergency.

In this connection the recommendation of R. J. S. Pigott, mechanical engineer for the Interborough Rapid Transit Co., of New York, who has designed and operated some of the most important steam plants in this country and who is one of the leading men in his profession, may be of interest. He says: "Boiler-feed pumps are usually either of the duplex outside-packed plunger or the three- or four-stage centrifugal type. Occasionally motor-driven triplex pumps are installed, but their use is undesirable. The principal feature required is reliability, which at once gives the steam-driven apparatus the precedence. The duplex direct-acting type until recently was used almost exclusively, but it is now being replaced by the turbine-driven centrifugal pump."

Injectors sometimes are used as standbys for boiler feeding, particularly in small plants. They are fairly satisfactory for this service but have the disadvantage that they will not operate unless the steam pressure within the boiler is approximately that for which the injector was designed.

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Book Reviews

The Four-Hour Day in Coal

Comment By R. Dawson Hall[*]
New York City

WITH the intriguing title "The Four-Hour Day in Coal," Hugh Archbald introduces (the words are not mine) "a study of the relation between the engineering of the organization of work and the discontent among the workers in the coal mines." Mr. Archbald has been proclaimed as the only coal-mining engineer in the Taylor Institute. In this book he unburdens himself of a mastering obsession. For years he has grieved over the short working time of the miner and loader. He feels, as all of us feel, that the workmen should be enabled to keep busy all the time they are supposed to stay at the mine face. Alas! those who know the coal miner know well that he does not stay on the job a full eight hours when cars come fast enough that he can make a good wage in shorter time.

Mr. Archbald lays the blame for slow mine-car supply on deficient engineering. I used to think I knew what engineering was, but the term is getting today to embrace management and economics, and, looking over the book, it seems wholly to deal with these phases of engineering, which are really only side functions of the engineer and which he has only lately taken, or tried to take, under his care. Mr. Archbald himself is not clear that organization will be regarded by the reader as the engineer's function and so to guide him gently into that way of thinking he has made his subtitle read awkwardly, "the engineering of the organization of work." He takes no chances with those graceless men who would make an engineer a conjurer with materials and the forces of nature and nothing more.

Yet There Is a Real Engineering Problem

Seeing then that Mr. Archbald avers that the defective engineering of coal mines is to blame for the inefficient work of the miner one wonders why he does not discuss the problem from the standpoint of the engineer as that functionary generally is known rather than from the point of view of management and economics, which usually are regarded as separate functions—those of the manager and operator respectively. I say this because there is in this problem a distinct engineering phase which Mr. Archbald does not for one moment consider.

First, then, let it be stated that the difficulty in keeping the miner steadily employed arises from trying to run underground railroads wholly or partly on a single-track basis. Even where double tracks are on the whole used—and this is infrequent—there is in every mine with which I am acquainted some part of the workings—an important part—that operates on a single-track basis. Every car that is loaded must run up the room or, in longwall, up the gate on the same track that is used for the return journey. This prevents steady loading and is the cause of much delay. Usually the entry from which the room is driven is also single-track. Now, single-track railroading always gives an intermittent delivery of cars, especially where the loading is on the extreme end of the stub track and where cars consequently cannot be delivered in a full train to the point of loading.

Seeing that with room work and with longwall as practiced it is impossible to deliver more than one, two or at most three cars at a time to the working face it is not feasible to provide the worker at the face with more than one, two or three cars at one time. Generally only one is supplied to two men. If the car is large the loss of time may be inconsiderable, for that one car may have such a capacity that it will provide to one man facilities for a quarter day's steady loading, and should cars so large as to hold ten tons be supplied—and they soon will be introduced—they will serve the ambitious loader for about half a day.

In many mines the ten-ton car is not feasible, either because the roof will not permit such a wide space unpropped as such a car requires or because the coal is too thin to permit a car of sufficient height or for both reasons. Furthermore, a high car takes much effort per ton to fill. It is easy to see that a car that is low can be filled without raising the coal above a normal shoveling level. Every inch above that adds to the labor of loading coal, and the height soon becomes prohibitive. Loading machines and conveyors, however, may rectify that difficulty.

Problems of Railroading Still Unsolved

With a system in which the cars are carried to the working faces and then, when filled, are pushed or pulled beyond it and by another route from that by which the empty arrived, an efficient loading capacity can be afforded even with a small car, but there are several difficulties. If the place is running into solid coal that plan is not possible. If it is working on the end of a block of coal it can be looked upon as conceivable, but in practice such a method of operation exists only on paper. It has been tried often and in every case has been found wanting.

The method of loading a string of cars from the side of a rib—sidewall working—has been advocated and even adopted by some operators, but it seems inevitably and admittedly wasteful of coal in the long run and is to be regarded as a quite dubious plan when the cover is heavy, especially with slow hand-loading. It has been used, however, and, it is said, successfully.

These difficulties are true engineering problems, but Hugh Archbald does not refer to them; perhaps he has not even considered them.

Mr. Archbald, however, it may be said, never tries seriously to solve his problem of doing away with the "unemployment-within-employment" in the coal mine except by assuming that an employer should be so ethical in his management that he cast profit to the winds and consent not only to increase superintendence but to put in many more drivers or motormen than prudence and competition would dictate. The problem is not so much one of management *per se* as of either engineering or economics. The author is good enough to quote the remarks I made at a meeting of the American Institute of Mining Engineers. I would prefer to refrain from repeating them, but as I still consider that they are as vital as I did when I uttered them, I will venture to quote some of them (they will be found on page 71 of Mr. Archbald's book):

"As to what the miner does, in comparison to what he could do, I think much may be said. We have pitched our plane altogether too low in the coal-mining industry. . . .

"There is very little doubt but that the coal miner could produce more. But there are two reasons why he does not; one is that he does not want to, and the other is that the operator does not really give him the opportunity that he would have if it were to the economic advantage of the operator to aid him in his production. Unfortunately, the miner is paid by the ton, and not by the day; consequently, the operator is not interested particularly in how many tons the miner gets out, except as it reduces the overhead. The operator cannot afford to have a single dayman idle, but he can afford to have idle several miners who are paid by the ton."

Asked to Spend Money Without Return

If the operator employed his miners by the day he would make a greater effort to keep them supplied with cars—and conversely they would make less effort to keep him supplied with coal. I pointed out, however, that the failure of the mine under the day-wage system would be due to the unwillingness of the miner to give a full eight-hour service, whereas the failure of the operator is due, under the tonnage system, to the fact that he cannot meet the needs of the miner without an undue expenditure on day labor and trackage facilities. When mining is really competitive and profits are small or even nil, and still more where losses have to be met out of savings and borrowings, as is frequently the case, the operator cannot afford to do other than run his mine as others are doing—namely, with a minimum of day and monthly labor. Any other plan spells bankruptcy.

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[*] Engineering Editor, *Coal Age*

When business is prosperous and profits are high, he can and generally does employ excessive day labor, and the idleness of the miner is largely reduced thereby. The operator at such times wants a large tonnage because every ton means profit, and he is willing to employ such a force of day workers as will enable the miner to give almost his full meed of service. As soon as business gets unproductive the operator has to reduce this day force to meet competition, and the service to the miner inevitably declines.

The only cure for inefficient mine-car service is an economic one. Mr. Archbald conveniently overlooks that fact. The operator cannot employ men to work for the interest of the employee without reward. The miner might give the operator two more hours of service. He refuses. He is not to be blamed; still less is the operator to blame who refuses to operate his mines in such a manner as would inevitably put his balance "into red ink." What is the cure? Surely to provide a profit to the operator where the service to the miner is well maintained.

Is It True That What Cures Also Kills?

Day labor will afford that profit but it will be more than balanced by the loss arising from the lower personal efficiency of men so employed. With complete mechanization of the operations in the mine there would be no incentive for the miner to slacken his efforts. So mechanization seems to be the cure. But this scheme of things is not possible till our engineering methods are much improved, and with the limitations imposed by the roof conditions—the fact that the roof will not stand without support—mechanization involves many difficulties, for with an extremely expensive machine (and others can hardly be considered) the service must be better even than the hand loader requires. Consequently complete mechanization is far in the future and may never be accomplished.

Another method would be to adopt a composite plan, paying the loader by the ton and also by the day. The tonnage rate would reward the loader proportionately to his efforts and the operator proportionately to his mine-car service. This method has never been tried. In fact, with miners leaving the mine when they please and refusing to punch a clock it is doubtful whether it would work.

As I stated at the time of making the remarks quoted: If full car service were given it is doubtful whether the men would stay in the mines as many hours as they do now. If they could make a day's pay in four hours, home they would go. The double method of pay is based on an eight-hour day, and the miner even now picks up his coat after six hours.

Miner Himself Shortens the Short Day

If he had full loading opportunity he might leave after three hours, and he would not hesitate to demand his full honorarium for a day's presence in his place. Truly it is to be feared that the union would back him in this breach of contract, if indeed it would permit such an agreement to be made, so firmly is the short day for the miner established by custom even though it is in violation of the contracts as now made.

On the whole Mr. Archbald in his 148-page 5 x 8-in. book is fair and well-informed. But despite Mr. Archbald's declaration we must protest that the four-hour day in coal has nothing to do with the striking propensities of the miner. It is not in the long list of his published grievances. Why should Mr. Archbald be so disingenuous? The miner always asks for more pay or that his rate of pay be not reduced. He also wants less deductions from his pay—less rent, less blacksmithing cost and cheaper powder, though these usually are provided below cost by the company. He is human and wants all he can get, and he has a union that is so well organized that he feels he can get it. Why waste time to invent other reasons when these are obvious and clearly stated, and the other grievances are less obvious and have never been stated by the miner?

The book discusses grievances, coal-mining conditions, the mine foreman and his problem, time for the miner, amount of work, record of complaints, discouragements and the "engineering need." The mine foreman and his problem in particular is understandingly written. The engineering need, it may be said, is a plea for the introduction of efficiency engineers into coal mines.

One cannot deny that the book is interesting, that the writer is well informed if not always unprejudiced and that the coal-mine executive will find the book enlightening even though it is written for the public and, as the wording of the slipcover advertisements suggests, for university debaters especially. The debating societies in our colleges are legion and active. It would be amusing yet distressing indeed to note what gross misuse they will make of this little volume. The book is published by the H. W. Wilson Co., of 960 University Ave., New York City.

An Aid to Shippers to Foreign Markets

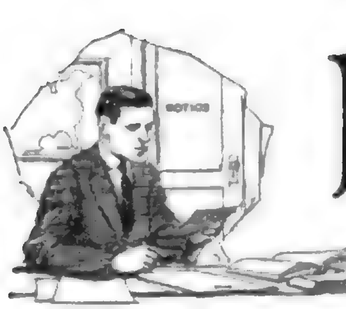
AMERICAN coal shippers who are desirous of seeking foreign markets for their product, or of holding or improving their trade connections abroad, will find a valuable asset in the cable service now being carried on by the Department of Commerce. This news is published weekly in *Commerce Reports*, a survey of foreign trade, by the Bureau of Foreign and Domestic Commerce, and presents, among a multitude of other items, last-minute reports of conditions existing in the foreign coal markets.

The average American coal man in position to ship to the seaboard had a taste of the export business in 1919 and 1920 and found it decidedly to his liking. Europe was then clamoring for our coal and in the flush markets that were reached, conditions were imposed by the American shippers which were impossible to maintain and which in many cases reacted disastrously on the American coal trade. To the British exporting is the result of long and careful planning, excellent shipping facilities, accessibility of foreign markets and a thorough understanding of trade conditions. It is in the last factor that we are so severely handicapped. Coal exporting is practically a new game for the United States, at least in the volume in which we do most things, and it is for this reason that the news cable service of the Department of Commerce is especially timely and worthy of careful attention by our coal shippers.

Examination of a single sheaf of these cable advices recently received reveals much valuable information. Credits offered by Great Britain, which must be met or at least considered; the tendency of Italian buyers to hold off payment in the hope of a rise in the lira exchange; terms granted American exporters in Latin America, are some subjects fully covered. Brazilian conditions are shown as improving, the Mexican economic tension is easing; Argentine imports are falling off (refused American merchandise in that country amounts to $1,250,000) and credits are difficult to negotiate; Chilean production is insufficient for domestic needs and the railroad supply is almost exhausted; foreign inquiries for coal have recently been received from Spain, Syria, etc.

Export market possibilities are not rosy now, but high costs and other unfavorable conditions which at present place us at a disadvantage with Great Britain can be lessened. When the American trade is again in position to make competitive export quotations, marked advantage will be had by the shipper who has gained a thorough knowledge of the trend of foreign commercial affairs. It is through the assimilation of just such information as *Commerce Reports* is now giving out that this background can be obtained.

R. R. Sayers and W. P. Yant recently made a report on the tannic-acid method for the quantitative determination of carbon monoxide in the blood. This report is published under Serial No. 2356 for May, 1922, Reports of Investigations, U. S. Bureau of Mines. The method of analysis described is particularly adapted to the determination of poisoning by carbon monoxide. It can be used for either a quantitative estimate or as a qualitative test in comparison with a small sample of blood from an unexposed person. The results from this method are more easily obtained and on the whole are more dependable than those yielded by any other method tried.



Problems of Operating Men

Edited by James T. Beard

Old-Age Pension and Age Limit

Basic Idea of Old-Age Pension—Advantage to Employer and Employed Alike—Need of a Practical Plan to Make Scheme Popular—Opposition by Radicals and Union Leaders

REFERENCE was made, some time since, in the columns of *Coal Age* to the old-age pension scheme, and the age limit fixed in its adoption by the Colorado Fuel & Iron Co. (Vol. 20, p. 1055).

The writer of the letter expressed a desire for the thoughts of others, particularly with reference to the 45-year age limit established by that company. It was stated that the objection had been offered by some miners who claimed that, if the plan was to be generally adopted by all coal operators, a man would be compelled to remain with the same company, after reaching the said age limit.

BASIC IDEA OF PENSION

The basic idea of the old-age pension is to make aged and physically disqualified workmen financially independent and afford them the much needed support, after having devoted the best part of their lives in useful service to society. The idea when first promulgated was socialistic, but has later been advocated as an industrial institution worthy of support.

Perhaps a more equable plan would be one that imposed the burden proportionately on the state, the employer and employee, somewhat after the plan of the Workmen's Compensation Law, which has been so widely adopted in many states.

The pension idea should commend itself to all employees of industrial labor, but to none more favorably than to the coal operator. To no class of workers is society more indebted than to the coal miner, who daily risks his life in this needful occupation and who is destined to toil in darkness, deprived of the sunshine to warm and gladden his heart.

DEVELOPS SATISFIED WORKERS AND FOSTERS LOYALTY TO EMPLOYERS

No operator will deny that a good workman is an asset of the coal industry. What plan could be devised that will tend to develop satisfied workers more surely and speedily than the old-age pension, by which the miner is enabled to look forward to a much needed support when disqualified for service by reason of years?

In my opinion, the pension idea fosters a loyalty to any organization that adopts the plan, increasing its strength and efficiency. A newspaper item announced, recently, that an engineer had been retired on a pension, after 33 years of active service for a certain railroad company. During that time the man had never been suspended and the pension was awarded him in recognition of his faithful service.

MAKING OF HOMES AMONG MINERS A PROFITABLE INVESTMENT

The advantage this scheme offers to the miner is apparent. It insures a competency in old age and gives him an incentive to faithful and loyal service. Its tendency is to foster in him the habit of settling down and making a home for himself and family. It is a good investment, paying dividends in money saved, home attractions, health and contentment.

What is needed is a practicable plan of operation. It must be understood that an industrial pension is a business proposition. A worker cannot be eligible to receive a pension, unless he has given his employers at least twenty years of useful service.

Why anyone should complain of an age limit of 45 years is hard to understand, since the company must be protected if an old-age pension is to be made operative. Indeed, I am surprised that a lower age limit, say 40 years, was not adopted, as many miners at the age of 60 approach the period of disqualification for active service in the mining of coal.

AGE LIMIT DISCOURAGES THE DRIFTING TENDENCY OF MANY MINERS

It is optional, of course, with a company to accept of a new employee who has reached the age of 45. Only an exceptionally physically strong man would be acceptable at that age, under the old-age pension provision; and this fact encourages men to remain in the employ of the companies whom they serve. It discourages the tendency of many miners to float from one place to another.

In closing, let me say the scheme will undoubtedly be opposed by radicals and labor unions, unless they are permitted to draft the rules and regulations controlling the proposition.

The chief objection from that source is that a certain number of years of useful service must be given the employer before the worker can enjoy the benefit of the pension. As is well known, the radical leader and the union organization demand that their members shall be loyal to that body, in any issue that may arise between them and their employers.

——, W. Va. PROGRESSIVE.

Following or Dependent Shots

Dangerous practices of miners show them to be unreliable—Firing of dependent shots unsafe—Cutting fuse too short and other bad habits—Training needed to develop good miners.

IN the many excellent letters regarding the shooting of coal off the solid, it seems strange to me that no reference has been made to the practice, so common among miners, of firing what are called "following" or "dependent shots." These are shots that depend for their safety on the previous firing of another shot, which is expected to explode first.

Many miners make a continual practice of firing such shots, which is nothing else than shooting off the solid, provided the first shot is delayed or misses fire, which is often the case. One has only to think, for a moment, of the many bad habits of miners; such as crimping a cap on the end of fuse with their teeth; opening a keg of powder with a pick; or filling a cartridge with an open light on the head; to be convinced that the average miner is unreliable in respect to his judgment of what is safe.

MEN OF LIMITED EXPERIENCE IN MINES MOST DANGEROUS

Not long ago, mention was made in *Coal Age* of a miner who had had 27 days' experience in the mine. I want to say this is the most dangerous class of men with whom we have to deal. For a few days, a new miner will listen to what is told him; but, as a rule, the man soon begins to think he knows more than the mine foreman himself.

Where miners are allowed to fire their own shots, one of the most dangerous things is their habit of firing one or more dependent shots. I have seen a miner drill as many as five shotholes, one behind the other, in the square face of his room. Invariably, the miner will overcharge the first shot to make sure of its blowing down the coal and setting free the shot that is to follow. Each succeeding shot will generally have an overcharge of powder, as is the custom with most miners.

Another practice I have observed is that the first hole may be drilled 5 ft. deep, the second hole 5½, the third hole 6 ft. and so on throughout the range of four or five shots intended to be fired at the same time, one following the other in quick succession. It is fortunate if the holes are not tamped with coal dust; but the augur drillings are almost certain to be lying on the floor where they fell, which means an added danger.

Local Explosion Liable

Where such shots are fired one can expect nothing less than a local explosion of the dust and gases produced in the firing of the first charge and exposed to the flame of the succeeding shots. Too often it has happened that such a local explosion has been extended throughout the mine, by feeding on the dust accumulated on the roads and travelingways.

It is my hope that the day is not far distant when the law will require that all miners shall have had at least two years' experience at the face and undergo an examination, before being given charge of a working place. This would practically eliminate the habit of miners to cut a short fuse or bite off the match from a squib, in order to hasten the explosion of a shot, besides many other evil practices.

Training of Miners Needed

We are needing more and more a course of training for miners. It is the only thing that will develop safe miners and eliminate the dangerous practices I have mentioned. I look back to the time when I and my brother worked ten years, for my father, who was an experienced miner and would not permit us to take a place of our own during all of that time.

The result was that we learned very much about safe mining that could not be learned in a few days or a few months. Time is required to develop the skilled miner.

Crawford, Tenn. Oscar H. Jones.

Upraising Sometimes Necessary

When it is necessary to drive an upraise in a mine — Dangers and difficulties in the undertaking — How the work should be arranged.

ALLOW me to add a few words to what has already been said in regard to upraising a shaft in a mine. As stated in the letter of R. H. Benney, *Coal Age*, May 11, p. 783, the most experienced men should be employed for the work.

In my opinion, the undertaking is a difficult one and has many disadvantages in comparison with sinking a shaft from the surface. However, there are conditions when it is necessary to employ this method. I could not recommend its adoption when the depth below the surface reaches 20 or 25 yd., if anything else can be done.

In the development of a mine, it may often happen that the work has been extended to a point where it is necessary to sink an air shaft for the purposes of ventilation. At this point, the company may own the coal rights only, and be unable to obtain the permission of the land owner, looking to the handling and disposal of the excavated material on the surface.

In such case, the only recourse is to upraise the shaft from the point, in the mine, chosen for its location. As has been stated, the scheme has the advantage of eliminating the need of pumping. Also, the material excavated is dropped into the mine where it can generally be stored in abandoned places and thus avoid the expense of hoisting it to the surface.

The work is beset with difficulties even when skilled men are employed. The excavation has not gone far above the roof of the coal when the air becomes bad. Much time is consumed in idleness, waiting for the smoke to clear after a shot is fired.

Dangers Involved When Miner Works on a Scaffold

The men must work on scaffolds that are expensive to build and maintain. They are continually exposed to falling material and there is always a possibility of suddenly striking material that will run, which makes it a particularly dangerous proposition.

In addition to these dangers there is the added expense of the labor required to unload the cars of excavated material, by hand, to say nothing of hoisting what timber is needed to the top of the hole where it is put in place. A man must always be kept on the bottom to handle the cars loaded and keep the opening clear.

Where it is decided to drive an upraise I would recommend locating the shaft over a heading that will provide a way in and out for the empty and loaded cars, and thus avoid the loss of time required for switching when changing the cars at the foot of the shaft. In this arrangement there should be a single track passing under the shaft and having a slight grade in favor of the loaded cars, just sufficient to enable the ready handling of the cars.

Samuel McKay,
Supt. Harmon Creek Coal Co.
Burgettstown, Pa.

Another Letter

THERE is not often a condition arising in a mine that would justify a shaft being driven from the mine upward. The superintendent whose inquiry appeared in *Coal Age*, Feb. 2, page 212, and started this discussion, appears to favor the proposition, because it will save the expense of hoisting the excavated material, which is dropped into the mine and can be utilized for building stoppings, and because there will be no need of pumping the water from the shaft while sinking.

The advice given in the reply to the inquiry will probably change this superintendent's mind altogether, or at least put him on the fence, as to his choice of sinking or upraising. I have been engaged in work of this kind myself and, while it can be done (there are few things that cannot), I would not recommend the attempt being made; it is a dangerous job.

Pause, for a moment, and consider what a condition would exist when the workers have passed through the 6 ft. of slate and 4 ft. of sandrock. These two strata must form the foundation of further excavation. From that point upward he would have to timber the shaft for sixty feet.

Material Must Be Hoisted

This timber must be taken into the mine and hauled back to where the work is located; but the worst is not yet. Each piece must be hoisted in the hole, which means much delay and added expense. It is more than likely that the shaft is started at some isolated part of the mine where there will always be more or less delay in handling the needed supplies and removing the refuse.

The timber will generally be cut on the surface and, in that case, the dimensions of the excavation must be such as to conform to a given size. When driving an upraise it is often difficult to limit the size of the excavation, as the material is liable to break over the sidewalls, making it necessary to pack the space behind the timbers solid.

In this kind of work, it is never possible to foretell just the conditions that will arise. If it is thought best to take the rough timbers into the mine and frame them at the shaft, it will make the work of hauling that material more difficult. Moreover, the framing cannot be done as speedily or as well as on the surface.

Building the Scaffold Higher Requires Time and Labor

Scaffolding is required in upraising; and every time a round of shots is fired it is necessary to build the scaffold higher, before the work can be continued. A previous writer has already spoken of the danger to which the workmen are exposed when returning to the face, after firing a shot. The loosened material will often be found hanging and ready to drop at any moment.

Finally, when the hole has been pushed through to the surface the shaft is not finished as, generally, the wooden framing put in to support the walls, will have to be taken out and the shaft relined. Brick or concrete will often be used for that purpose, in order to make a more permanent job.

It is probable that very little of the excavated material can be used for building stoppings, as suggested in the inquiry. Labor and expense will be saved by making these stoppings of brick or concrete. Nothing is more important in the ventilation of a mine than well built stoppings.

Taking everything into consideration, there is a distinct advantage in sinking a shaft, instead of attempting an upraise in the mine. The fact of the work being safer will convince most men that sinking is the better plan. By sinking a borehole in the center of the cut, as has been suggested in the reply, not only is the excavation kept drained, but the borehole will provide a means of ventilating the shaft besides.

Both the excavated material and all needed supplies are handled more readily from the surface. Also, the permanent shaft timbers can be put in place at once. In my opinion, it is not advisable to start a shaft, until all necessary timbers are on hand and the derrick is in place. I have known of a bad mishap occurring by reason of starting a shaft before timbers of the proper size were on the ground.

The accident happened one night, after the eleven-o'clock shift had gone home. One whole side of the excavation caved in, smashing the light timbers into splinters. It cost several hundred dollars to restore what had been destroyed, to say nothing of the delay caused by the accident. Fortunately, there was no one in the shaft at the time. When every proper precaution is taken, the work of sinking a shaft is dangerous and none but the most careful men should be employed.

Osceola Mills, Pa. S. D. Hainley.

Inquiries Of General Interest

Dimensions and Capacity of Centrifugal Pumps

Dimensions of Centrifugal Pumps Determined by Required Discharge Under Given Head — Peripheral Velocity of Impeller a Function of Discharge Head — Other Data

Kindly answer, through the columns of *Coal Age*, the following questions having reference to the installation of a centrifugal pump, to be installed at the foot of a mine shaft, 1,500 ft. distant from the powerhouse where the voltage at the generator is 559 volts d.c. It is desired to know the size of pump that will be required to discharge 400 gal. of water per minute through a vertical height of 570 ft., which is the depth of the shaft.

In addition to the above, state the number of impeller blades necessary and the diameter of the impeller wheel; also the diameters of the suction and discharge pipes. What sectional area of feed wire will be required to transmit the necessary current from the powerhouse to the pump located at the bottom of the shaft?

———, Pa. Inquirer.

In replying to this question, we would refer the inquirer to a previous inquiry regarding centrifugal pumps, which appeared in *Coal Age*, Vol. 19, p. 827. The principle of action of centrifugal pumps is there explained and the formulas given for finding the discharge of the pump under a given head.

In the present case, it is necessary to first estimate the diameter of column pipe required for a discharge of 400 gal. per min., assuming a velocity of 400 ft. per min. in the pipe, which is customary in common practice. The required diameter of the column pipe is then

$$d = 0.25\sqrt{G} = 0.25\sqrt{400} = 5 \textit{ in.}$$

The next step is to calculate the friction head in the column pipe, for the required discharge when the pump is in operation, which is as follows:

$$h_1 = \frac{G^2 h}{800\, d^5} = \frac{400^2 \times 570}{800 \times 5^5} = \text{say } 36.5 \textit{ ft.}$$

Adding this friction head to the actual head of discharge, gives for the effective head under which the pump must operate; thus, $h = 570 + 36.5 = 606.5$ ft.

In estimating the size of a centrifugal pump, it is safe practice to limit the head under which the pump must operate to 100 ft. This will call for a six-stage pump, in this case. The size of the discharge portal, or the required number of the pump for this service is given by the formula

$$N = \sqrt{\frac{G}{\sqrt{10\, h}}} = \sqrt{\frac{400}{\sqrt{10 \times 606.5}}} = \frac{20}{\sqrt[4]{6065}} = 2.27, \text{ say } 2\tfrac{1}{4} \textit{ in.}$$

Good results are obtained whenever practicable to set the pump below the water level, in such position that the inflow to the pump will be unrestrained and have a velocity ranging from 6 to 12 ft. per second. No suction pipe is then required. Also, the number of impeller blades run from 6 to 12, depending on the size of the pump.

We will assume this pump is operated by a 60-cycle motor running at a speed of 1,750 r.p.m. The motor being direct connected or mounted on the pump shaft, the speed of the pump will be the same. But, the peripheral speed of the impeller, as determined by the head against which the pump must operate, is

$$v = 60\sqrt{2gh} = 60\sqrt{2 \times 32.16 \times 606.5} = 11{,}850 \textit{ ft. per min.}$$

In order to develop this peripheral speed, when making 1,750 r.p.m., the diameter of the impeller wheel must be

$$d = \frac{11{,}850}{3.1416 \times 1{,}750} = 2.155 \text{ ft., say } 26 \textit{ in.}$$

The horsepower required to operate this pump, taking the weight of the water as 8⅓ lb. per gal., and assuming an overall efficiency of 60 per cent, is

$$H = \frac{8\tfrac{1}{3} \times 400 \times 606.5}{0.60 \times 33{,}000} = 102.1 \textit{ hp.}$$

Or $102.1 \times 0.746 = 76.17$ *kw.*

Assuming a line drop of, say 15 per cent gives the available voltage at the motor as $0.85 \times 559 = 475$ volts. The required current is, therefore, $(102.1 \times 746) \div 475 = 161$ *amp.*

The pump shaft being 1,500 ft. from the powerhouse and allowing another 600 ft. for conducting the current to the bottom of the shaft and reaching the pump, the total length of wire is $2(1{,}500 + 600) = 4{,}200$ ft. The transmission of the required current through this wire, including the return, calls for a sectional area of

$$A = \frac{10.8 \times 4{,}200 \times 161}{475 \times 0.15} = 102{,}500 \textit{ circ. mils}$$

This is an 0 wire, having a diameter of 325 mils or, practically, ⅓ in.

Ventilation During Strike

Peculiar roof conditions in No. 8, Pittsburgh Seam, in Eastern Ohio — Should air currents be reduced during the strike period to prevent cutting action on roof in roads and airways?

Since the strike began, the question of maintaining a continuous circulation of air in the mine has been asked and different opinions expressed. Those familiar with the conditions in No. 8 seam in this locality will remember that the coal, which is here 4 ft. 9 in., in thickness, is overlaid with a drawslate running from 12 to 18 in. thick. Above the slate is a thin seam of coal of a snappy nature and having about the same range in thickness.

The purpose of this inquiry is to ascertain through *Coal Age*, if possible, what is the general opinion in regard to the disintegrating effect of the air current on the roof of mine roads and airways. Would it be better to keep the air traveling continuously, twenty-four hours a day, or shut down the fan completely during this enforced period of idleness on account of the strike?

Again, what would be the effect if we ran the fan, say eight hours a day? At its usual speed, the fan produces 30,000 cu.ft. of air per minute, in this mine, which is a drift and follows the natural bed of the seam.

Duncanwood, Ohio. P. J. Griffith.

This is an interesting question, which we gladly submit to the practical judgment of those more intimately acquainted with the conditions in this seam, in Eastern Ohio. In general, however, it can be stated that it would be better to either run the fan continuously or shut it down altogether, rather than to attempt to maintain a circulation during eight hours, each day.

The alternate operation and shutting down of a ventilating fan will generally produce, in the mine airways, an alternate dry and wet condition of the roof, which has a disintegrating effect on certain shales and other soft strata forming the roof.

Whether it would be better to operate the fan full time and at its full capacity, or to shut off the circulation entirely, is a matter that can only be determined by a knowledge of and experience in the local conditions. If this is a wet mine, or if it generates some gas, better results will generally be secured by running the fan continuously at a reduced speed. We shall be glad to hear from our many practical readers facing similar conditions.

Examination Questions Answered

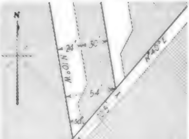
Miscellaneous Examination Questions

(Answered by Request)

QUESTION—*(a) Explain the advantage gained by driving rooms at an angle with the gangway level, in seams of moderate inclination where it is desired to take the cars to the faces of the rooms. (b) If the gangway level is driven N 40° E and the room sights are N 10° W, what angle do the rooms make with the gangway? Show by sketch. (c) If these rooms are driven 24 ft. wide, with 30-ft. pillars between them, making the room centers 54 ft., what is the distance between room centers, measured on the gangway?*

ANSWER—(a) In moderately inclined seams, the pitch is often too great to allow cars to be handled with safety on the full pitch of the seam. By driving the rooms across the pitch, or at an angle with the gangway level, it is possible to reduce the grade so that the cars can be taken to the face of the room without danger.

(b) As shown in the accompanying figure, the direction of the gangway lying in the northeast quadrant and that of the rooms in the northwest quadrant, the angle that the rooms make with the gangway is equal to the sum of these two bearings, or 10 + 40 = 50 deg.



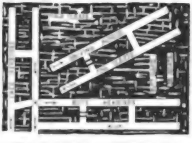
(c) The distance between room centers, as measured on the gangway, is found by dividing the distance measured square across the rooms, center to center, by the sine of the angle the rooms make with the entry. Thus 54 ÷ sin 50° = 54 ÷ 0.766 = 70.5 ft.

QUESTION—*Explain what is meant by cleavage planes in reference to geological formations.*

ANSWER—A cleavage plane, in geology, refers to a plane in which a substance divides or is readily split. The principal cleavage planes of geological formations are the bedding planes, or planes of stratification, in which the material was deposited.

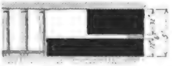
QUESTION—*Explain the meaning of the terms "cleats and joints" and state in what respect these may differ from cleavage planes.*

ANSWER—Cleats and joints are division planes that are more or less at right angles to the stratification of the material. In this respect, they differ from the principal cleavage planes, which lie in the plane of stratification. As illustrated in the accompanying figure, there are two kinds of cleats called "face cleats" and "butt cleats." The butt cleats are often called "joints." The distinction between face cleats and butt cleats or joints is that face cleats are more pronounced and continuous, while the butt cleats are short and irregular.



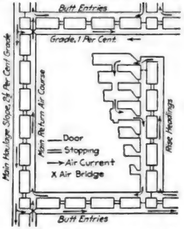
QUESTION—*Explain and show by sketch what is "bench mining."*

ANSWER—Many of the thicker seams of coal consist of two or more layers of coal of different quality. These layers may or may not be separated by a thin clay parting. Owing to the difference in the quality of the coal, it is often desirable to mine it in benches. As shown in the accompanying figure where two benches are separated by a clay parting, the upper bench may be mined a few yards in advance of the lower bench. The mining or undercut is then made in the clay parting. After being mined, the upper bench is either blasted or wedged down. When this has been loaded out, the lower bench is generally mined by a light lifting shot.



QUESTION—*(a) Make a sketch of a form of panel, showing the ventilation and explain the working of a panel. (b) To what particular condition is the panel method of mining adapted?*

ANSWER—(a) In the accompanying figure is shown, on the left, a pair of slope headings having a 2½ per cent grade. Two pairs of butt entries are turned to the right off the main return air-course at distances of, say 400 ft. apart. Headings are driven to the rise of each pair of butt entries, at distances that will provide for driving rooms from 75 to 100 yd. in length and allow for a 50-ft. barrier pillar at the head of the rooms, for the protection of the cross-entries. Barrier pillars of the same thickness are also left to protect the butt entries. Rooms are then driven on the strike off these rise headings. Under favorable conditions of roof and floor, the rooms are driven to the right and left of each pair of headings, thus forming a wider panel than that shown in the figure. The butt entries are driven so as to give a grade of about 1 per cent in favor of the loaded cars.



(b) The panel system of mining is particularly adapted to the working of gaseous seams of coal, or when mining under bad roof conditions that would hinder the complete extraction of the coal by other methods.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THAT the country as a whole is rapidly getting back to an employment basis, with the exception of the coal and cotton textile industries, is shown by the industrial survey for May, issued June 5 by the Department of Labor through its employment service. "The broadening out of industry in most all lines of activity for May," the department states, "clearly emphasizes the fact that business depression is behind us. Confidence is restored. June will accentuate the upward movement. Industry is steadily expanding."

This monthly survey is based on actual figures taken from the larger industrial payrolls of the country, the statistics on which its computations are based being gathered each month by the department's special agents in 65 principal industrial centers. In all, 1,428 firms each usually employing more than 500 workers, or a total of 1,600,000, are comprised in the survey. On May 31 these 1,428 firms had 52,154 more employees on their payrolls than they carried on April 30, an increase of 3.2 per cent.

Industrial classifications showing increases in employment are: Vehicles for land transportation, 11.2 per cent over April; railroad repair shops, 4.6 per cent; iron and steel and their products, 4.5 per cent; stone, clay, and glass products, 4.5 per cent; lumber and its manufacture, 3 per cent; food and kindred products, 2.96 per cent; metal and metal products, 1.5 per cent; textiles and their products, 1.1 per cent; and paper and printing, 0.8 per cent.

Decrease in employment was shown in leather and its finished products in May of 3.9 per cent; tobacco manufactures, 2.9 per cent; liquors and beverages, 0.99 per cent.

Building construction widened in May over April. A genuine building boom is on throughout the country. A shortage of carpenters, bricklayers, and plasterers exists in many of the 231 principal industrial centers. Wheat cutting has started in Texas, and large numbers of men will be absorbed in the harvest fields.

Of the 65 cities, 49 report employment increases during May over April, with percentages of increase from 0.02 in Paterson, N. J., to 19.5 in Memphis, Tenn.

Sixteen cities report employment decreases, the percentages of decrease being from 0.2 in Louisville, Ky., to 11 in Cincinnati, Ohio.

Betterment in South Central Zone

The steady increase in employment shown in most industrial lines for the last four months continues in the South Central district. There is practically no unemployment in the principal cities and towns. Considerable activity in tobacco planting is in evidence. Building is increasing steadily. Cotton prices are encouraging farmers to increase this annual crop. Coal mining shows a remarkable increase, while lumber and textiles show a slight decrease. The iron industry is two-thirds of normal capacity in the Birmingham district with indications of further employment within the next thirty days.

INDUSTRIES REPORTING AN INCREASE IN EMPLOYMENT IN MAY, 1922

Industries	Amt. of Inc.	P.c Inc.	Weight*
Vehicles for land transportation	24,446	11.2	14.5
Railroad repair shops	2,843	4.6	3.8
Iron, steel and their products	16,459	4.5	23.7
Stone, clay and glass	735	4.5	1
Lumber and its manufacture	747	3	1.5
Food and kindred products	3,740	2.96	7.8
Metal and metal products other than iron and steel	1,370	1.5	5.4
Textiles and their products	2,590	1.1	13.9
Paper and printing	392	0.8	2.0
Miscellaneous industries	1,051	0.4	16
Chemicals and allied products	152	0.2	4.5
Total	55,025		

INDUSTRIES REPORTING A DECREASE IN EMPLOYMENT IN MAY, 1922

Industries	Amt. of Dec	P.c Dec	Weight*
Leather and its finished products	1,979	3.9	2.9
Tobacco manufactures	884	2.9	1.8
Liquors and beverages	8	0.99	.05
Total	2,871		

*Per cent employed May 31 to total reported employed in 14 groups.

Mid-Atlantic Revival Is General

The industrial advance prevailing in the Middle Atlantic district during recent months is steadily gathering momentum, a decided betterment being evident in all lines. The great volume of all types of building construction has materially increased operations in almost every line of trade and industry and indicates a return to normal conditions. Building operations in the various cities have absorbed the available supply of building trade mechanics with an apparent shortage of skilled labor. Marked advances and increased operations in the automobile and accessories industries, and further improvement in the iron and steel industries is reported. The railroad industries show substantial gains in some lines with reduction of forces in others.

Less Idleness in New England

Employment conditions throughout New England show a marked improvement. Unemployment continues chiefly in textiles, due to labor suspension. While some improvement is noted in the metal trades, conditions are not back to normal as yet. In certain sections unemployment exists in the shoe industry, although improvement is indicated, as a number of factories reopened last month and many workers have returned. The amount of unemployment in unskilled labor and the building trades has been materially reduced.

Work Full Time in Middle West

Manufacturing industries in the Middle West show a definite improvement in employment conditions. A return to full-time schedules is apparent in all sections. Employment conditions in the stock yards are improving. A decided shortage of farm hands is reported in the corn belt. Rubber industry showed a gain in employment. Automotive, steel and iron industries have increased their forces. Coke production and employment also increased. Employment shows improvement in structural and architectural iron work, stone, clay and glass industries. The sawmills and planing mills have added more employees.

Industrial Gains Continue in South

A marked but gradual improvement is evident in all industrial lines in the South Central district. Improvements are particularly noted in coal, iron and steel, stone, clay and glass products. Building construction is active. Marked improvement is evident also in the textile and lumber industries. Farm labor is in demand in many sections.

Illinois Mining Institute Holds Busy Technical Meeting Cruising from St. Louis to Keokuk on Mississippi

Importance of Bottom Layouts—Smith Advocates Home-Made Power—Clayton Answers Smith—Are Alternating-Current Cutters Dangerous?—Stone Dust Only Cure for Franklin County Explosions

BY E. W. DAVIDSON*

A HUNDRED Illinois mining engineers and a few guests spent Thursday, Friday and a part of Saturday of last week on board the stern-wheel river steamer "Golden Eagle" cruising the Mississippi from St. Louis, Mo., to Keokuk, Ia., and back. It was the annual outing and technical session of the Illinois Mining Institute. While the trip lacked nothing in good fellowship and carefree joy, be it said to the credit of the Institute, an interesting and instructive program of papers and discussions on such subjects as modern mine-bottom layouts, safety methods and purchased power versus locally generated power for mines held a great deal of undivided attention during four sessions, each more than two hours long. The Institute is getting down to business. Prof. H. H. Stoek, of the University of Illinois, presided. A good deal of the material developed at the Institute outing will appear in later issues of *Coal Age*.

The steamer left St. Louis at 11 a.m. June 8 and proceeded slowly up the river, touching at Quincy Friday morning and stopping at Keokuk that afternoon. The boat, with everybody looking interestedly over the rail, went through the locks at the end of the world-famed Keokuk dam, landed its passengers, turned around and took the Institute aboard again early in the evening for the trip to St. Louis. During the four hours ashore the entire hundred men were the guests of E. I. du Pont de Nemours & Co., whose largest powder plant occupies a tract of land three miles west of Keokuk.

The plant has been making powder there for 32 years, but never before had even a single visitor been shown through it, such is the scrupulousness with which the company practices safety. Unprecedented though it was, the whole Institute, after it had been "frisked" thoroughly for sulphur matches, was taken through the scattered plant, in groups of five men each. No powder was in process of manufacture at the time. Supper was served in the company's club house. Then the party was motored back to the river. Some made a hasty visit to the immense power station at the dam before the "Golden Eagle" left the wharf.

D. D. Wilcox, superintendent of the Superior Coal Co., opened the program Thursday morning with a paper bringing out the necessity of laying out a mine bottom not by rule of thumb but by the best engineering practice the coal-mining industry has developed. He said too many mines are excellently equipped on top only to have their production expensively hampered by a poor arrangement underground.

J. H. Haskins, state mine inspector, traced the history of coal mining in this country from early days upward, characterizing each phase by the type of haulage used: First dogs, then mules and then electric locomotives. He suggested a number of changes in mining methods at or near the face which he thinks would reduce accidents, get out coal with less explosives and with less degradation.

D. J. Carroll, chief engineer for the Chicago, Wilmington & Franklin Coal Co. explained briefly the bottom layout at his company's new Orient No. 2 mine, which is expected to hoist from 1,000 to 1,200 tons per hour using 6-ton mine cars, 20-ton haulage locomotives and two 13 ton skips with rotary dumps and bottom weigh pans. An auxiliary shaft, he said, was being provided and it could hoist 2,500 tons a day.

O. J. Pleschner, mining engineer for the United States Fuel Co., declaring that many mines are pretty outside but pretty rotten within, described the shaft layout and four-entry system which has been developed at Westville and which Mr. Pleschner thinks is good enough to square up with even the best of top equipment.

A short description of the bottom layout at the new Glen Rogers mine, operating in the Beckley seam in West Virginia, a layout designed by Carl Scholz, was read by Dr. John Rutledge. The mine is designed, when fully developed, to hoist 13,000 tons daily—8,700 by the main shaft and 4,300 by the airshaft. The mine plan provides that cars never turn around but always arrive at the bottom "right end to."

The relative merits of purchased power for mines versus power generated at the mine got a thorough airing when J. Paul Clayton, vice-president of the Central Illinois Public Service Co., read a spirited and effective paper setting up the central station's case and Prof. Stoek read one prepared by C. W. Smith, chief engineer for the Nason Coal Co., describing the Nokomis mine power plant, which Mr. Smith figures produces power for 9.88c. per ton of coal hoisted when the mine is working only at 70 per cent of full capacity. He estimates that when working at full blast the cost would be reduced to 7c. He had calculated that purchased power would cost his mine 9.31c.

NOKOMIS PLANT BUYS POWER DURING STRIKE

"Mr. Smith didn't tell the whole story about the Nokomis plant," said Mr. Clayton in a sort of rebuttal, after the reading of the Smith paper. "He didn't say that right now, during a strike, he shut down this low-cost plant and is buying power from us. It is cheaper to do so. The plant is really not complete. What if that 1,000-kw. turbo-generator should break down? Good engineering practice, of course, would require that an auxiliary machine be always ready to go into service. The only reason why an expensive auxiliary wasn't installed there is that our power line is just outside the door. So in reality a much greater investment should be figured into that plant before its performance is compared with the service afforded by purchased power." Mr. Smith was not there to make answer.

Following two papers on power a discussion arose over the relative dangers of using direct current and alternating current at the working face. Mr. Clayton thought that with the same voltage both kinds of current presented equal danger. The mining public is impressed with the risk of using alternating current merely because with it the voltage delivered to the machines comes so much nearer the full rated potential than it does when direct current is used. If the precautionary measures commonly known and adopted were practiced in the use of alternating-current cutters Mr. Clayton thought that accidents would not occur. Mine Inspector Haskins declared that although more machines use direct current than use alternating current yet 80 per cent of the electrocutions in Illinois are caused by the latter.

H. V. Patterson, engineer for the American Coke & Chemical Co., joined the boat party at Quincy, and read a description of the new process of coking installed by his company at its Granite City (Ill.) plant, which, he asserted, brings Illinois coals at last within the coking class. In the discussion which followed, Institute members were anxious to know whether the new process would successfully coke all the Illinois coal. Mr. Patterson wasn't positive of the entire list of coals that have been coked by his company

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*Western editor, *Coal Age*.

but he enumerated several from the southern counties as well as coals from the Cambridge region in Ohio, from western Kentucky and from California. The latter coal, he said, was practically lignite. He prophesied that the Roberts coking process, owned by his company, will open up new outlets and new markets for Illinois mines and Illinois operators will be enabled to enter the byproduct market.

Great interest was aroused by J. E. Jones, safety engineer of the Old Ben Coal Corporation, when he read extracts on safety methods and accidents in Franklin County from a voluminous and exhaustive report which he is making to his company after long and expert study. Next to gas, he said, coal dust is the cause of most of the explosions in Franklin County. His company's experience seems to indicate, he said, that a mine cleaned and watered by the most thorough methods known is little, if any, safer from coal-dust explosions than one knee-deep in dust. Neither frequent cleaning nor constant watering gives sufficient protection, hence he devised, and his company adopted, a shale-dust system for damping out explosions.

By this method shale from the No. 6 seam in Franklin County pulverized to a point where all of it goes through a screen of 150-mesh, 97 per cent through 200-mesh, and 92 per cent through 255-mesh is suspended in delicately balanced troughs along the roofs of entries so that the rush of air ahead of the flame of an explosion dumps the non-inflammable dust into the atmosphere. He says it extinguishes fire and reduces the heat so quickly that unhurt men within the explosion zone can soon breathe with safety. In Mr. Jones' opinion, shale dust, next to permissibles, is the best protection a mine has against extensive damage by explosion.

Mr. Jones' studies of dust dangers reveal the fact that dust in aircourses is far more combustible than that in haulageways and that dust on ribs and roof of haulageways is more dangerous than that on the floor. The percentages of combustibility he gave were these: For aircourse dust, 79 per cent; dust near working faces, 68 per cent; on roof and ribs of haulageways, 65 per cent; on haulageway floors, 52½ per cent. Dust-laying water, he pointed out, damages the mine timbering.

Mr. Jones read some interesting figures showing, among other things, that the accident rate in Franklin County is much above the average of the state and that in 1919, when that clause of the compensation law went into effect providing that an injured miner may collect compensation from the day of the injury providing he is unable to work at the end of the fourth week, the rate of non-fatal accidents bounded sharply upward though the percentage of non-fatals is constantly going down. He concluded his paper with a long list of changes in mining methods which he would suggest as a means of reducing accidents.

Douglas C. Corner, mining engineer of St. Louis, read a paper discussing the merits of several modern types of loading machines, and E. C. Reeder, chief engineer of the Hillside Fluorspar Mines, described fluorspar mining and milling at the last session of the Institute, which was held on board the boat St. Louis bound.

Trade Commission Report Shows Investment And Profits in Bituminous Coal Mines

INVESTMENT and profit of the bituminous-coal industry for the six years, 1916-1921, are covered in a report to Congress by the Federal Trade Commission on June 1.

The report covers only 1,126 companies producing 32 per cent of the tonnage. The commission notes that for the last three years, owing to the injunction in the Maynard case, it has been unable to get complete reports, and for that period it uses figures collected by the National Coal Association, for which the commission will not vouch.

The average rates of profit for the six years 1916-1921 are given as follows:

1916	8 per cent	1919	6 per cent
1917	29 per cent	1920 (9 mos.)	23 per cent
1918	18 per cent	1921	3 per cent

In the first three months of 1920, the report says, operators in Ohio, Kansas, Tennessee and West Virginia earned from 5 per cent to 18 per cent under Fuel Administration control. During the peak of panic prices in 1920 (August) they were making net margins for the month which, according to the National Coal Association returns, were at the rate of 59 per cent in Ohio, 57 per cent in West Virginia, 64 per cent in Tennessee and 79 per cent in Kansas, although the average price for August, 1920, in none of these states exceeded $5.23 a ton.

The average investment per ton of output is fixed by the commission at $3.12. To get its final figures on average rates of profit the commission has apparently taken this investment estimate and divided it into net margins ascertained by the commission for other groups of companies, not entirely identical, for the years 1916-1918, and margins for still other groups of companies reporting to the National Coal Association for 1919, 1920 (nine months) and 1921.

The commsision has revised its definition of the term "margin." As used in this bituminous report the term "net margin" means the difference between production cost and sales realization, less actual selling expenses. Hitherto the "margin" reported by the commission had to cover selling expense. The report says that under the new plan the net margin, except for "certain very minor financial items of expense, some of which are of a doubtful nature, is equivalent to the net operating income before payment of interest or federal taxes."

The commission believes that under its organic act it possesses full power to require from operators the facts touching the ownership of the coal supply and the production and trade in coal, and it is seeking final legal determination of the scope of its powers in the Maynard Coal Co. case and a similar case brought by twenty-two steel companies, which latter case is now pending in the Court of Appeals of the District of Columbia, having been argued on May 22.

An important fact emphasized in the report is that the rates of return of many companies were reduced through inclusion in their investment of vast tonnages of coal deposits far beyond what is necessary for use during the life of the present mines and mining equipment. Proper accounting would keep separate books for the business of mining coal and the business of holding coal lands for far distant use. Then the net margin made in the sale of coal could be divided by the investment reasonably necessary to mine and sell the present output of coal and the resultant rate would be the real rate of return on the present operations in the coal business. As it is, the inclusion of investment in excess coal lands makes the rate of return, and therefore the price of coal, appear more reasonable than it otherwise would.

The commission states its conclusions as follows:

"The principal conclusions in the matter, which are supported by the testimony of many coal operators, are:

"(1) The need of more accurate and more complete information regarding the ownership of bituminous-coal deposits and coal mines, the true investment therein and the true profits arising therefrom.

"(2) The need of ascertaining the profits of selling companies owned by or affiliated with mining companies (no profits of such companies being included in this report) and also of other wholesalers or dealers in coal.

"(3) The need of establishing the coal industry in public confidence and protecting it by devising means of federal supervision and publicity, so as to avoid periods of excessively high prices and of severe depression."

THE FEDERAL TRADE COMMISSION has again taken up the Maynard Coal case, which it had laid aside pending its attention to the suit of the Claire Furnace Co., involving the same issues as to its right to collect cost data of basic industries. The commission has filed a brief opposing the issuance of a permanent injunction in the District of Columbia Supreme Court, which had issued a temporary injunction against the commission. This case is expected to follow the Claire Furnace Co. case to the Supreme Court.

Senatorial Coal Inquiry, Started by Retailers, to Be Held Up While Hoover Plan Is Tested

By Paul Wooton
Washington Correspondent of *Coal Age*

SENATE investigation of coal prices probably will be deferred pending further developments in the trade as to the operation of Secretary Hoover's price recommendations. This is the outcome of a conference held by Senator Borah, chairman of the Senate Committee on Labor, with Secretary of Commerce Hoover. Senator Borah announced that if the operators and retailers work together and will co-operate to protect the public in the matter of prices he will not favor at this time any investigation and will let the price proposition work itself out.

"But if the maximum which has been fixed by Mr. Hoover is going to be used by the operators as a minimum price and thus pushed on to the retailers, and the operators and retailers together take advantage of the situation to boost the price to the public," said the Senator, "I would favor an investigation to force a complete exposition with a view to laying the foundation for public control."

The trouble was started by the retailers who carried their fancied troubles to the Senate. A flurry of discussion in the Senate arose on June 8, at which the operators were caustically attacked by Senator Walsh, of Massachusetts, and several other Senators, but they were defended in turn by Senator Sutherland, of West Virginia. The deliberate statements made repeatedly during the discussion in the Senate to the effect that the Secretary of Commerce had been buncoed by the coal operators into authorizing large increases in coal prices led Secretary Hoover to issue a statement showing just what has happened in the matter of bituminous-coal prices.

The statement, dated June 9, shows the following average of spot prices of coals representative of 90 per cent of the total output of the United States, compiled by *Coal Age*, which indicates the results of the effort to restrain the rise of prices at the first of June:

Week of	Average Spot Price	Index No. (June, 1914=100)	Week of	Average Spot Price	Index No. (June, 1914=100
March 27	\$2 05	170	May 8	\$2 78	230
April 3	2 06	171	May 15	3 16	261
April 10	2 19	181	May 22	3 67	303
April 17	2 23	184	May 29	3 25	269
April 24	2 49	206	June 5	3 08	255

The flare-up in the Senate, as was revealed by the debate, was prompted by complaints made verbally to numerous Senators by representatives of the retailers. Anti-administration Senators and those with socialistic leanings listened eagerly to charges against Secretary Hoover and the coal operatros. They made haste to interpret these charges on the floor of the Senate and in various ways reveal that their knowledge of the situation was inaccurate and far from comprehensive.

The course pursued by the retailers is being criticized by disinterested observers. It should be pointed out that there is no evidence that the retailers who came to Washington represented retailers generally. The movement had its origin in Chicago and the attacks on Secretary Hoover seem to have been inspired in that city. Chicago retailers are said to have taken offense when the Secretary of Commerce made it clear that he would oppose any plan which would allow retailers to dispose of stocks at replacement prices. In that connection Secretary Hoover made the following statement:

> The essential thing about the coal prices is that the runaway market has been stopped, prices have receded from those reached on May 15 except for a small tonnage from those producers who refuse to co-operate, and the public has so far been protected from a repetition of 1920. Some of the Senators have been misinformed by misleading statements from a small group of retail dealers who object strenuously to any attempt to restrain prices.

Secretary Hoover also addressed the following letter, dated June 8, to Homer D. Jones, president of the National Retail Coal Merchants' Association:

"I am in receipt of your letter of June 6, which shows a good deal of misunderstanding of the situation. Your letter gives the impression that the householder should be informed by me that retailers are warranted in advancing the price of coal by \$1.75 per ton as the result of negotiations by the administration with the operators, and in support of this you make certain statements to which I cannot agree.

"First, you give the impression that spot smokeless coal for *household purposes* was selling at \$1.75 prior to the strike and that at \$3.50 maximum for *run-of-mine* the householder is burdened with an advance of \$1.75. From the quotations you append to your letter the price of 'run-of-mine' and slack (steam coals) prior to the strike was \$1.75 to \$2, but from the very quotations you give me it is evident that for lump (which is the householders' main interest) the prices prior to the strike were \$3 to \$3.25, and not \$1.75, as might be inferred.

"Under the request I have made to the operators that they should adhere to the Garfield scales plus such alteration as changes in production costs warrants, and that in the case of smokeless coal they should not exceed \$3.50 for run-of-mine and \$3.75 for lump, you will see that those who are justified in asking the maximum would have advanced lump over even pre-strike prices by 50 to 75c. per ton, and not \$1.75. In other words, you have ignored the great decrease of differential in favor of the householder that has been suggested by me to the operators.

PRICES AT PEAK BEFORE HOOVER TOOK ACTION

"Second, your letter seeks to give the impression that there was a rise of \$1.75 per ton in smokeless after my statement of June 1. You are well aware that the prices of coal generally reached their peak above this on May 15, before I first became active. Today smokeless lump exceeds your quotation for pre-strike by about 25c.

"Third, I am glad to note your statement confirming the fact that retailers have large stocks of pre-strike coal. My recommendation to the retailers was that in public interest and the interest of the coal trade the retailers should reserve their pre-strike coal, or their contract coal, which they obtained at pre-strike prices and much of which came from the districts of shorter rail haul and therefore lower cost, for the smaller householders, and that it should of course be sold at actual cost plus a fair handling charge, and that any coal bought at strike prices should be sold to the larger consumers likewise at cost and fair handling charge. As you will see, the increases since the strike are largely for run-of-mine and therefore for steam coal.

"In reply to the statement of your association at our conference that it was necessary for the retailer to sell his coal at replacement cost, thus advancing all pre-strike coal to strike coal prices even from longer-haul districts, I stated that I thought it would be very unfair to the consumer and would constitute at least moral profiteering.

"Fourth, I would again call your attention to the fact that you misquote the statements issued here when you say that the price of coal has been fixed at \$3.50 per ton. There has been no price fixed for coal. The operators were requested by me: To co-operate with me in carrying out my proposal 'that Garfield prices for run-of-mine coal should be the basis for computing sales prices, with such adjustments as are necessary to include the wholesale selling costs, changed conditions at the mines, and other factors that will be fair to the public and to the operators and will maintain production of coal.' Any agreement to adhere to this is a moral agreement between each operator and myself.

"Further than this, I have expressed the view with regard to the Alabama fields, in following the above, that changes in conditions did not warrant a price in excess of 25c. under the Garfield scale, and that in the smokeless fields they did not warrant a price in excess of $3.50 for run-of-mine, with a differential of 25c. for lump instead of the pre-strike differential of 75c. to $1. Many operators having low costs are upon this formula selling considerably below this maximum for spot coal. I note that you ignore the whole question of a just price to the mines upon which production can continue.

"Fifth, I note that you state: 'Our association is opposed in principle and as a matter of sound business to governmental policy, official or unofficial, or to legal control of the coal business whether with respect to production or distribution.'

"I assume I am to take from this that your association does not wish to co-operate in the prevention of profiteering in this time of emergency. I notice there is an entire change of sentiment from that expressed at our conference at this office, when you strongly urged that a restraint in price was necessary in the public interest, and that you considered the action taken by the administration had prevented a runaway market. I cannot believe that the change of views which you here evidence at all represents the vast majority of retail coal dealers in the country because in their intimate contact with the needs of the householder I have found from inquiry that in the great majority of places they have made no attempt to secure unusual profits—that they are making every effort to supply their customers and to charge them simply the cost of their stocks of coal or their contracts for coal plus a reasonable handling charge.

"Sixth, it does seem to me that the retail coal dealers could play a fine part in this emergency if they would follow this suggestion:

(a) All coal to be sold at cost plus a reasonable handling charge.

(b) The cheap pre-strike and contract coal to be reserved for the smaller household trade.

(c) Steam and larger domestic consumers to be supplied from current purchases plus a reasonable handling charge.

(d) Co-operate to prevent rising mine prices, for some districts are refusing to accept the formula I have outlined above and are asking $5 per ton.

(e) Handle coal on straight lines from operator and wholesaler without speculative resales in the trade.

"By such co-operation I feel sure we can save the public from runaway prices such as we witnessed in 1920, thus saving to them several dollars per ton—of more interest than questions of 25c. or 50c."

On June 13 Mr. Hoover said the retailers had not yet accepted the conditions named in the last paragraph of his letter, but added that he thought they would co-operate.

In the course of the debate in the Senate it was charged that the operators are selling coal at the spot price and are not making shipments on their contracts. This led Senator Sutherland to say:

"There is absolutely no basis for the statement that any contract was violated and I am sure the Senator [Mr. Borah] misapprehends the situation or has been misled by the men who have been talking to him. Contracts for the sale of coal to wholesale and retail dealers in the cities of Chicago and Detroit are made upon the condition that they be adjusted each month according to market conditions. It perhaps is true that on May 31 the operators told their customers that during the ensuing month they would have to pay the market price. That was not a violation of the contract. It was pursuant to a contract thoroughly understood by those wholesalers and retailers.

"The very wise and far-seeing action taken by the Secretary of Commerce is to prevent what happened in 1920. It was done with the cordial co-operation of coal operators who were in a position to get six or eight dollars a ton, and next week more, if they chose to do so, as other people do when they take advantage of market conditions. Patriotically they have agreed to co-operate with Secretary Hoover in an effort to prevent such conditions as occurred in 1920. I do not know of another industry where the men engaged in it have subjected themselves so willingly to governmental suggestions to keep down prices in the interest of the consuming public."

Senator Lenroot asked at one point in the discussion whether there is any remedy for the coal situation short of nationalization or whether there is any remedy that Congress could afford to apply short of nationalization. To this Senator Walsh, of Massachusetts, replied: "I think there are many remedies. To tell an indignant public that has been gouged and robbed because of emergencies like this that we are powerless is absurd and ridiculous. It is a blow at our institutions and our capacity. I believe the government could step in and say: 'Unless you settle this strike, unless you come together on mutually satisfactory terms, rather than let our people suffer, rather than have our people profiteered upon, we propose to step in temporarily and conduct this business.' "

Senator Calder, of New York, said that unless some remedy is found it will not be long before the country will compel Congress to deal with this subject as it has with water. In reply to that suggestion, Senator Sutherland declared that such a course would result in the same failure as did the government's effort to operate the railroads. "The inevitable result of government ownership or operation of coal mines," he said, "would be to increase vastly the cost of coal to the consumer."

Senator King, of Utah, said that "it ought to be understood by both the operators and the miners that the government, in the interest of the people, is not going to lie helpless indefinitely, and that it will take such measures as may become necessary in the interest of the people."

Secretary Hoover was in Youngstown when he heard that Senators Borah and Walsh were planning to take some action in the coal matter. This led him to send the following telegram to the coal section of his department:

I am delighted to learn from the press that Senators Borah and Walsh have taken on the job of restraining coal prices with the retailers or other parts of the coal trade. The field is clear for any action they may desire to take, as no action has been taken beyond the responsibility I assumed in public interests of asking each individual operator that he should in the future not exceed the last Garfield war scales, with such changes up and down as the altered conditions would warrant, and I have made the statement that such changes should not exceed a maximum price in average of 25c. below the Garfield scale in some districts or about 50c. above in others. The result has been to reduce the strike prices as much as $2 in certain districts and should save the public from a further ascent to $10 or $12 mine prices as in 1920. If Congress will provide a better emergency method, I shall indeed be glad if they would do so, as the administration has no powers but persuasion and the willingness of the majority of the operators to co-operate. In the meantime, as many retailers have upward of thirty days' supplies on hand of pre-strike coal, much of it from districts of short rail haul, I hope the Senators will get the retailers to comply with my request that the retailers do not mark up the price of this coal to the public.

Tiring of the politics being played by the retailers, Secretary Hoover on June 10 called upon Roderick Stephens, chairman of the board of directors of the National Retail Coal Merchants' Association, to "do away with disputes on trivial questions and enter upon co-operation with me." He called attention to the fact that the retailers have made no answer to his request that they co-operate in the emergency. He asked Mr. Stephens flat-footedly "whether your association will or will not undertake to protect the consumer" by co-operating in the way set out in his letter of June 8.

Coronado Coal Co. Seeks Reargument

THE Coronado Coal Co. has obtained from the U. S. Supreme Court permission to petition the court for a reargument of the case decided June 5 and in the meantime the court record has been stayed for ninety days, during which the $800,000 appeal bond filed by the national organization of the United Mine Workers of America and the district union will continue effective. It is understood that this status will be maintained until the Supreme Court convenes next October.

While holding that under Sections 7 and 8 of the Sherman Anti-Trust law labor unions were suable, the court held that in the present case the national organization of the United Mine Workers was not responsible for the strike on which it was based, but solely District 21, and that the case against this district organization, involving a verdict of hundreds of thousands of dollars, would have to be retried in the Arkansas federal courts.

Consumers Had 32,000,000 Tons of Coal June 4, According to Hoover Estimate

IN RESPONSE to Senate Resolution 298, calling for information on the coal situation, Secretary Hoover on June 5, 1922, made a formal reply in which he reviewed the conditions of supply and demand, prices and the status of the strike.

He estimates the consumption of bituminous coal, May 1 to June 4, at about 65,000,000 tons. Taking into consideration production since the strike began and stocks on hand April 1, he reports that there should have been about 32,000,000 tons in consumers' storage on June 4, in addition to approximately 10,000,000 tons in transit. He points out that in the two years ended May 1, 1920 and 1921, production of bituminous coal was respectively 455,000,000 and 473,000,000 tons.

Discussing prices the report distinguishes between contract and spot coal, says that the amount under contract is variously estimated at from three-eighths to three-fourths of the production; that prices on old contracts are undisturbed by the strike and that "spot coal receives the full impact of the new demand." It was pointed out that for various reasons non-union coal was sold at or below the cost of production prior to the strike. The prices mounted rapidly after April 1 and to prevent a repetition of the price panic of 1920 it was deemed necessary to use the influence of the administration to halt price advances.

It was pointed out that governmental agencies have no legal authority to terminate or intervene in the strike but that informal proposals were repeatedly made to both sides in which they might concur with hope of settlement.

March Smokeless Output 1,689,420 Tons More Than a Year Ago

PRODUCTION of West Virginia smokeless coal during March, 1922, totaled 3,399,571 net tons, an increase of 1,689,420 tons compared with the corresponding month of 1921. The tonnage produced and shipped by distircts was as follows, in net tons:

	February 1922	February 1921	March 1922	March 1921
Pocahontas	1,425,255	859,630	1,594,250	827,410
Winding Gulf	670,803	271,541	766,210	331,656
New River	491,975	285,520	600,881	282,820
Tug River	386,980	227,515	438,230	268,265
Totals	2,975,013	1,644,206	3,399,571	1,710,151

Shipments of smokeless during March last by the Norfolk & Western R.R. totaled 2,032,480 net tons; by the Chesapeake & Ohio, 680,490 tons; by the Virginian Ry., 686,601 tons. These three railroads moved the following tonnage by districts during March, 1922:

NORFOLK & WESTERN RY			
Pocahontas	1,594,250	Clinch Valley	158,875
Tug River	438,230	Kenova	163,335
Thacker	505,375		
		Total	2,860,065
CHESAPEAKE & OHIO RY			
Logan	1,351,840	Coal River	172,470
New River	513,910	Kentucky	370,510
Winding Gulf	166,580		
Kanawha	128,930	Total	2,704,240
VIRGINIAN RY.			
Winding Gulf	599,630	High Volatile	19,372
New River	86,971		
		Total	705,993

Coal Movement Gains by 9,403 Cars

LOADING of revenue freight during the week ended May 27 totaled 821,121 cars, compared with 792,459 cars the previous week, or an increase of 28,662 cars. This was also an increase of 25,786 cars over the corresponding week last year, but a decrease of 77,048 compared with the corresponding week in 1920. Coal loadings during the week of May 27 totaled 91,370 cars, an increase of 9,403 over the preceding week, but a decrease of 74,241 cars compared with the same week last year, and a decrease of 83,242 cars compared with the same week in 1920. Coke loadings totaled 8,851 cars, a decrease of 484 cars compared with the preceding week.

Hoover Price Plan Necessary and Timely, Is Opinion of Survey Director

DR. GEORGE OTIS SMITH, director of the U. S. Geological Survey, is thoroughly convinced that Secretary Hoover's effort to prevent a flurry in coal prices is both necessary and timely. His statement in reference to the effort to prevent a runaway market follows:

"After attending the conference which the Secretary of Commerce has had with the coal operators, as well as living with the coal question for weeks, I am fully convinced that the plan Secretary Hoover is engineering in the interest of the public holds a larger promise of keeping coal prices down than any other move that is feasible at this time.

"In simple terms of current coal production and consumption the present situation is loaded. Since April 1 our mines have put on the cars only about half as much coal as the country has burned. Fortunately, the output is slowly increasing, but no possible stocks of coal in storage can long stand this drain of three and one-half to four million tons a week. Yet the complacent public sleeps, seemingly awaiting some explosion to arouse it to action. Such an effective alarm could come in the shape of a sudden jump in coal prices, but Mr. Hoover and the coal operators have not thought it safe to permit the past to be repeated, and they are agreed that the safety-first move is to put some definite limit on prices.

"A buyers' panic and a runaway market usually happen at the same time, and each aggravates the other. Consumers with foresight, especially the largest consumers, bought large supplies of coal while the buying was good, but others who were less wise did not stock up, and these 'foolish virgins,' as Secretary Hoover has called them, will be the first to find themselves short of fuel. Their plight is partly of their own making, and to judge from the $8 and $10 spot prices of 1920, many of them, once awake to their need, will try to buy at any price.

"It is obvious that with this condition of undersupply of many consumers, coal production needs to be stimulated, and a fair price, to accomplish most, must be a generous price. Furtheremore, the Secretary's decision as to a limiting price had to be reached without delay. It was imperative that even the high-cost producer be encouraged to contribute his tonnage, and therefore a fair maximum price was established for as wide a territory as possible, and the coal operators were urged to speed up production. Tons mined are far more important to the country than cents saved.

"The buying public should keep in mind that the $3.50 which is set up as a fair price for most of the coal fields south of the Ohio and Potomac is a maximum price and that it applies only to spot coal. More than half of the present output of these fields is still under contract and in view of the steadier business these contracts permit, the contract coal is normally delivered at much lower figures, and those who will insure themselves with new contracts can also get much better terms than this spot price.

"Moreover, the maximum fair price is set up as only a temporary measure to steady the nerves of what threatened to be a runaway market. It is hoped that this $3.50 price will become only a mark to show where the 1922 price of coal was halted. A repetition of the $8, $9 and $10 prices of 1920 is what Mr. Hoover is trying to avoid. The public should remember that two weeks ago, when the leading coal producers were first called to Washington, the price had begun to jump to $4 and even higher. The appeal then made to the sellers of coal for co-operation fortunately met with a sympathetic response.

"With these facts before me, I question either the logic or the memory of whoever attacks this co-operative move in which the representatitves of the public and the coal operators are joining."

Kinds of Haulage and Cutting Machines in Coal Mines of United States in 1921*

By W. W. Adams†

In 1921 5,064 coal mines out of 7,088, or more than 71 per cent, were using animal haulage, according to a statement showing the kinds of haulage and cutting machines used in coal mines of the United States compiled by the U. S. Bureau of Mines from one of the standard mining directories (Coal Field Directory, published by the Keystone Consolidated Publishing Co., Pittsburgh, Pa.).

Rope haulage was reported by 1,066 mines, or 15 per cent of the total, representing a larger number of mines than in 1918, but a decrease of 2 in the percentage for the group as compared with all classes of mines. Electric haulage was reported by 3,274 mines (46.2 per cent), and the number of motors in use was 11,265. The percentage of mines in this class has not changed materially, but the actual number of mines has shown a gain of about 900 during the past four years.

Compressed-air locomotives have not increased either in actual or relative number, the percentage for the past year being but 1.2. The number of mines using storage-battery locomotives has increased from 3.6 per cent of the total shown four years ago to 9.8 per cent for last year, the latest figures showing 693 mines with 1,428 locomotives. A total of 405 gasoline locomotives was reported by 271 mines, the number of mines representing 3.8 per cent of the total, practically the same percentage as in previous years. Steam locomotives numbering 1,069 were reported in use at 528 mines and pits, which is 7.4 per cent of the total, a very slight decline from past years.

Coal was mined by hand in 3,332 mines, 47 per cent of the total number, indicating an increase in the number of mines in this group, although the percentage has not changed materially. Electric cutting machines, 17,875 in number, were reported for 3,607 mines, which is 50.9 per cent of all mines reporting. Compressed-air machines were employed in only 288 mines, or 4.1 per cent, and the number of machines in use was 2,159, both figures being smaller than those for previous years.

Stripping operations were shown for 146 mines and the number of shovels was tabulated as 72. While the former figure is perhaps too low, the latter figure has practically no value, because the descriptions of open-pit mines frequently failed to state the number of shovels in use.

The outstanding features of the statement, given herewith, are the figures showing the large number of electric motors and electric cutting machines that have been installed in coal mines, and simultaneously, the extent to which animal haulage and hand methods of mining still prevail.

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*Reports of Investigations, U. S. Bureau of Mines.

†Statistician, U. S. Bureau of Mines.

HAULAGE SYSTEMS USED IN THE COAL MINES OF THE UNITED STATES

State	Total Mines Reporting	Animal	Rope	Compressed Air Mines	Compressed Air Locomotives	Storage Battery Mines	Storage Battery Locomotives	Gasoline Mines	Gasoline Locomotives	Steam Mines	Steam Locomotives	Electricity Mines	Electricity Locomotives
Alabama	214	182	67	7	30	6	23	9	13	32	38	51	145
Arkansas	57	49	22	..	..	1	1	3	3	11	11	8	9
Colorado	168	149	78	5	6	9	16	1	1	16	[illegible]	52	127
Illinois	379	311	17	1	1	60	252	13	22	6	6	222	952
Indiana	238	170	10	..	..	26	51	3	5	[illegible]	30	129	375
Iowa	116	106	34	..	..	3	3	3	5	8	9	23	42
Kansas	100	77	5	..	..	16	30	4	9	19	39	11	21
Kentucky	698	481	45	6	6	[illegible]	108	11	11	22	32	322	929
Maryland	79	66	16	..	..	1	1	4	4	5	6	29	59
Michigan	14	11	..	..	..	....	....	...	...	...	...	12	33
Missouri	88	68	4	1	1	5	6	3	4	16	25	8	12
Montana	37	30	13	..	..	1	1	1	1	1	2	23	35
New Mexico	28	[illegible]	16	..	..	1	1	2	2	2	2	10	23
North Dakota	59	53	6	..	..	....	....	7	7	5	6	5	7
Ohio	694	390	68	1	1	41	99	17	17	37	67	273	453
Oklahoma	116	97	43	1	1	[illegible]	7	4	4	20	21	24	28
Pennsylvania (bituminous)	1,925	1,364	353	29	63	153	289	88	166	84	110	893	3,061
Tennessee	136	105	27	4	4	8	8	19	30	19	23	43	130
Texas	50	46	9	..	..	1	3	4	4	5	5	4	4
Utah	27	25	12	..	..	4	5	...	...	1	1	16	72
Virginia	148	103	15	..	..	20	38	6	7	15	19	[illegible]	440
Washington	36	23	12	3	3	6	9	4	5	[illegible]	11	14	50
West Virginia	1,422	943	108	5	34	230	414	[illegible]	72	53	64	882	2,939
Wyoming	[illegible]	48	21	2	5	1	3	1	1	3	3	33	67
Total bituminous	6,883	4,917	1,001	65	155	667	1,368	263	393	409	613	3,149	10,013
Pennsylvania (anthracite)	205	147	65	19	57	26	60	8	12	119	456	125	1,252
Grand total, 1922	7,088	5,064	1,066	84	212	693	1,428	271	405	528	1,069	3,274	11,265
Grand total, 1920	6,286	4,387	946	99	255	469	903	241	337	529	964	2,735	99,855
Grand total, 1919	6,136	4,458	996	112	301	437	832	226	319	497	907	2,848	9,586
Grand total, 1918	4,947	3,035	844	91	387	180	349	215	336	478	1,017	2,352	9,184

MINING MACHINES USED IN THE COAL MINES OF THE UNITED STATES

State	Total Mines Reporting	Mines Using Hand Mining	Mining Machines — Electric — Mines	Machines	Compressed Air Mines	Machines	Stripping Mines	Shovels
Alabama	214	156	51	187	13	113	8	1
Arkansas	57	40	14	49	...	...	5	2
Colorado	168	84	88	298	20	105	..	..
Illinois	379	169	209	2,262	15	110	1	1
Indiana	238	111	109	843	9	56	21	9
Iowa	116	71	45	98	1	1	..	..
Kansas	100	78	17	33	1	1	20	8
Kentucky	698	311	380	1,645	21	268	2	5
Maryland	79	64	16	29	...	....	..	..
Michigan	14	2	13	87	...	....	..	..
Missouri	88	47	35	125	...	....	13	9
Montana	37	12	27	91	4	15	..	..
New Mexico	28	21	17	54	1	4	..	..
North Dakota	59	43	14	25	1	1	7	3
Ohio	694	176	375	1,633	4	5	25	23
Oklahoma	116	61	45	223	2	17	7	..
Pennsylvania (bituminous)	1,925	943	959	5,452	124	1,053	19	9
Tennessee	136	92	40	158	12	93	..	..
Texas	50	45	7	12	1	1	..	..
Utah	27	8	20	172	...	....	..	..
Virginia	148	79	70	286	1	1	..	..
Washington	36	27	4	4	9	65	..	..
West Virginia	1,422	505	972	3,737	27	140	1	1
Wyoming	54	20	36	204	6	24	..	..
Total bituminous	6,883	3,165	3,563	17,707	272	2,073	129	71
Pennsylvania (anthracite)	205	167	44	168	16	86	17	1
Grand total, 1922	7,088	3,332	3,607	17,875	288	2,159	146	72
Grand total, 1920	6,286	3,188	2,897	15,827	341	2,947	47	65
Grand total, 1919	6,136	3,134	2,920	16,126	332	2,686	34	49
Grand total, 1918	4,947	2,348	2,146	13,033	402	4,126	65	124

Tenth Week of the Coal Strike

EDITORIAL REVIEW

ON THE surface there has been little change in the strike situation since the first of June and there is little evidence of any sub-surface movement looking to a settlement. There are about as many operators expressing their desire for a resumption of mining as there are miners longing to return to work, but among the many operators' organizations in the soft-coal field and from the United Mine Workers there comes no talk of peace.

One large operating interest in Ohio is reported to have appealed to Senator Pomerene for his assistance in getting the local miners' union to meet in a conference on wages. The Pittsburgh Coal Producers' Association last week addressed a letter to the president of District No. 5 asking for a conference on wages. In the absence of President Gibbons, Vice-President P. T. Fagan of the local union replied, refusing to confer and repeating the demand for a four-state agreement. Some observers look on this as a means of placing the miners on record prior to an attempt to operate some of the mines in the Pittsburgh district on a non-union basis.

The Geological Survey notes that the gain in production last week came in the Connellsville, eastern Kentucky, Tennessee and New River districts, in two of which the non-union miners had been on strike for some time. The Connellsville *Courier* of June 8 says that men are returning to work and that there will be a marked change in the situation before the first of July.

Intimidation as a weapon to keep down coal production is regularly resorted to by the union and its sympathizers. A gathering of strikers induced the workers in the Lansing mine, in Belmont County, Ohio, to quit work, although they were loading coal mined two years ago. Non-union workers in the Rosedale Coal Co.'s mine in Monongalia County, West Virginia, were subjected to a fusillade of shots which was only stopped by state police. One arrest has been made in Marion County as the result of threats made by a party of striking miners that the Hughes mine near Fairmont would be shot up if the non-union miners continue to work.

Eastern Ohio stripping mines continue to produce between 40,000 and 50,000 tons per week, although in some cases it has been necessary to obtain relief in the courts by way of injunction to prevent union miners from interfering with employees at these mines. An injunction was issued during the past week by Federal Judge Sater, of Columbus, restraining union miners from interfering with stripping operations in Harrison and Jefferson counties.

Here and there, as at the Kern Coal Co. wagon mine near Terre Haute, Ind., union miners are continuing at work in defiance of the union officials.

A board of conciliation has been granted the employees of the coal mines of Inverness County, Cape Breton, to examine into wage and working conditions, by the Department of Labor. The company interests have appointed Gordon G. Mitchell, of Halifax, as their representative, and Isaac MacDougall, of Inverness, has been named by the miners. The miners of Inverness applied for a conciliation board following a decrease in their wages.

Anthracite Operators Will Not Renew Wage Contract Without Reduction

ANTHRACITE miners have not published their reply to the operators' proposal for arbitration of their controversy as this is written, but unofficial reports substantiated by publication in President Kennedy's newspaper, *The Panther Creek News*, published in the anthracite region, confirm the belief that the miners are opposed to the arbitration plan, but that the miners will offer to continue negotiations on the basis of the present wage scale—that is, the one in the contract just expired. It is further suggested that the miners will offer to arbitrate the other demands, some nineteen in number, which have to do with matters other than the wage scale.

The scale committee of the miners took the arbitration proposal of the operators, outlined in *Coal Age* of last week, before a meeting of district officials of the union at Hazleton last week. The general scale committee gave out the following statement on Wednesday evening, June 7:

"The general scale committee met again today and prepared the official answer to be made to the representatives of the anthracite operators regarding their proposal for arbitration. The committee can only say that the operators' offer has been rejected, and our position will be fully explained when we meet with the operators at our next conference."

Samuel D. Warriner, spokesman for the anthracite operators, made the following statement on Tuesday, June 13:

"Reports to the effect that anthracite operators are contemplating or even considering a renewal of the wage contract in effect up to April 1 are absolutely without foundation. I can only regard these reports as indicating a desire to spread the belief that the wages paid up to April 1 can be maintained. This, as we have repeatedly pointed out, is out of the question.

"The operators are firm in the position they have taken that unless the men are willing to consider our proposal for a decrease in wages the only alternative is the appointment by the President of a tribunal 'To ascertain and consider all the facts and determine the question concerning wages and conditions of employment at issue between us.'"

Indiana Operators May Take Legal Action Based on Decision in Coronado Case

OPERATORS in Indiana in several instances recently have refused, it is said, to continue checking off dues of union engineers and firemen kept at work at the mines now idle by strike, asserting they had no contract with the miners calling for such action. The union has instructed these men to leave their places and permit the mines to flood.

Information from Clinton is to the effect that in some cases the operators expect to stand pat in their refusal to continue the check-off system and in the event the enginemen are taken off the jobs and damage to the mines results, action will be brought against the mine workers' organization under the decision of the U. S. Supreme Court a few days ago which holds labor organizations responsible for the actions of its individual members.

Trouble at the Deep Vein and Graff mines, west of Terre Haute, occurred June 8, due to reports at employment of non-union men. The Vigo County sheriff's forces were called to the mines. The trouble at the Deep Vein apparently had been settled, for no miners were to be found. The deputy sheriffs found about 100 miners at the Graff mine protesting against resumption of work before settlement between the operators and the United Mine Workers of America. John Hessler, president of District No. 11, U. M. W. A., is in Kentucky and the miners' headquarters would make no comment on the situation.

5,000 *Miners in Central Pennsylvania Resume Work During Latter Half of May*

THE semi-monthly Johnstown district report of the Pennsylvania State Employment Bureau for the two-week period ending June 1 says: "There has been a little change for the better in the mining situation throughout the six counties assigned to this district since our last report. From authentic sources in our report of two weeks ago we stated there were 65,000 miners idle on account of the coal strike throughout this territory, but we now find that about

5,000 have returned to work. Our prediction is that there will be no permanent settlement made until after July 1, but we expect a great many more men to go back to work in June, especially in those fields that have always been non-union."

The Pittsburgh office reported that few miners had applied for employment. The New Kensington report shows that no skilled miners had applied for work in non-union mines, but that there had been a few calls for such workmen.

"The situation throughout the coal mines in our district," the McKeesport office reported, "is about the same as it was two weeks ago. We have a few miners coming to our office for outside labor work."

Several Connellsville Mines Are Now Operating on a Normal Basis

GAIN in output in the Connellsville coke region continues slowly but surely in spite of two large miners' mass meetings during the last week and other efforts in the way of talk and intimidation on the part of the strikers and United Mine Workers' organizers.

The Standard plant of the H. C. Frick Coke Co., one of its two large plants in Westmoreland County, having 901 ovens, and the last of their plants to be affected by the strike, was reduced to eleven miners the first of last week, but has now recovered to the extent that it is operating about 60 per cent of normal. The Leisinring No. 2 plant is up to 90 per cent. The Bridgeport mine, near Brownsville, resumed operations Tuesday, June 6, and has since been shipping three cars of coal a day. The Frick operations as a whole have more than 300 more miners at work than a week ago.

The Hillman Coal & Coke Co. has resumed operations at the Griffin No. 2, Isabella and Tower Hill No. 2 plants, shipping a car or two daily from each plant. The Crystal plant is working at normal and the Warwick plant of the Diamond Coal & Coke Co., a subsidiary of the Hillman Company, also is at 100 per cent. The Pittsburgh Steel Co. has fired 100 of the 400 ovens at its Alicia No. 1 plant, near Brownsville, and is getting enough coal from its two mines to keep them going.

At the Linn plant the American Coke Corporation has increased output to three cars a day, as compared to two cars a day last week. The Republic Iron & Steel Co. has increased 50 per cent at the Bowood plant, started last week. The Mather Collieries Co. is working on 100 per cent basis and the Crucible Company at 80 per cent.

A couple days ago at the plant of the Taylor Coal & Coke Co. at Searight one of the strikers fired a shot at one of the men working at the boilers, slightly injuring him. The man who did the shooting was arrested.

Utah Still Turbulent; Operators Assure Governor There Will Be No Profiteering

AS A result of the holding up of stages and the firing at mine trains by strikers in the Carbon County coal fields of Utah during the past week, the National Guard has once more been ordered by Governor Mabey to hold itself ready to go to the scene of trouble at a moment's notice. A few arrests have been made but all is quiet again and it seems probable that the soldiers will be dismissed a second time without moving against the strikers. The foreigners who were ordered to turn in their arms are still holding their weapons and are likely to continue to do so, regardless of the fact that it is well known that they are breaking a state law.

In a recent conference between leading coal operators of the state and Governor Mabey the former agreed to pay retroactive to April 1 any scale of wages that may be agreed upon in the states where unions are in control in the coal fields. The committee assured the Governor that the operators would live strictly up to the Hoover levels as to the price of coal and that there would be no profiteering. What effect this agreement as to the wage scale will have on the disposition of the National Guard units is not yet known.

Court Awards $330,000 Damages Against Tidewater Exchange Debtor Members

DECISIONS granting awards amounting to more than $330,000 against five debtor members of the old Tidewater Coal Exchange were handed down by Judge Learned Hand, of the Federal Court for the Southern District of New York, last week. The suits were brought by Major W. R. Coyle, as trustee of the exchange, and it is believed that the awards granted indicate the outcome of other suits aggregating about $1,000,000 brought against other debtor members.

The coal firms whom the Court decides against and the amounts of the awards are: Archibald McNeil & Sons Co., $198,000; Johnstown Coal & Coke Co., $17,000; New York & Philadelphia Coal & Coke Co., $11,509.62; West Virginia & Pennsylvania Coal Co., $72,000, and Morrisdale Coal Co., $34,000. James F. Curtis and Chauncey Belknap appeared as counsel for Major Coyle in the suits.

Judge Hand in the McNeil case finds that under the rules of the exchange the coal did lose its separate ownership when it arrived, but obviously it did not lose its traceable identity in fact. The result of the consignment was to transfer property in those cars to the pool members in common. The transaction was like a sale to the pool members as a whole. The Court's ruling, in part, was as follows:

> Under the order of Jan. 14, 1918, every such sale was conditional upon any subsequent confiscation, which when it occurred defeated the title so acquired and made it as though the coal had been seized before title passed. In the case of coal in a pile the actual confusion would have prevented anyone from saying whose was taken, and the order would *de facto* be inoperative, but there was no confusion as things were, only an agreement by which the interest in those ascertainable cars passed from the defendant to the members of the pool. The order, if valid, must operate where it can; its limitations were only in execution.
>
> Moreover it is significant that the parties treated the transactions in this way without dissent. The defendant collected from the "divertees" of the coal and did not offer to restore to the pool the compensation; nor did they claim till this action was brought that their credit in the pool remained untouched. The validity of the order, which was not retroactive, is not challenged, and being valid, its effect was to undo any transaction entered into between the consignor and anyone else. I find, therefore, that the defendant is not entitled to credit for the coal so seized, but must pay upon its overdrafts as settled without it.
>
> There is, of course, hardship in this, but I cannot see why the creditors at large should bear it. Clearly they got no benefit from those shipments, and while the risk of the losses might indeed be justly borne by all, their position is the same as any buyer's who, having bought coal, had it confiscated. Therefore, I decline to allow this credit.
>
> The second point is of the credits bought within the four months period prescribed under Section 68 (b) of the Bankruptcy Act. It is proved that these were purchased "with a view" to use them as set-offs and it is conceded that the exchange was then insolvent. The point therefore turns on notice of insolvency and depends upon the evidence.
>
> It must be remembered that the exchange was an association wholly without capital and that therefore it could under no circumstances pay its claims in full unless all the debts were paid without any deduction. For every debt outstanding there was a precisely equivalent credit, not only in the amount of tonnage but in price. The insolvency of a single debtor therefore made it impossible for the exchange as a whole to be solvent. Indeed the hazard of insolvency went even deeper than this. The railroads had agreed to pay the "expenses of the Tidewater Coal Exchange incurred by or under the direction of the commissioner, to be arrived at in accordance with Rule 17" (later Rule 35) "of the Exchange." The railroads withdrew their "support" on April 30, 1920, and perhaps had the right to do so whenever they chose. Whether they had or not, it cannot be argued that they are liable for the expenses of collecting the accounts of delinquent members. They arise from the refusal of some members to pay their debts, and the railroads cannot be supposed to have guaranteed part of the members, i.e., the creditors, against the rest, i.e., the debtors, in their mutual dealings.
>
> Therefore, it certainly follows in view of the confusion and refusals to pay which had occurred before Jan. 12, 1921, that the exchange would be obliged to pay substantial charges which could only come out of its collections. At least by Jan. 12, 1921, if every debtor in the end proved solvent and could be forced to pay in full, it would only be after extended litigation and there could not possibly be a dividend of one hundred per cent on the claims. That being so, what on Jan. 12, 1921, and thereafter was the "fair valuation" of the exchange's assets under Section 1 (15) of the Bankruptcy Act? What is the fair value of a claim known to be subject to doubtful and extended litigation? Obviously it is less than its face under any method of appraisal. Perhaps the exchange might have been solvent on July 1, 1920, if all the debtors were sound and all were tractable, but by Jan. 12, 1921, everyone knew that the second condition was quite the reverse of true. Any debtor who bought a credit for a set-off was therefore sure to get upon it more than any other creditor could get, and if he had reflected must have seen that he would. That is what the law forbids.
>
> All this was reflected in what I may fairly call the "going price" for credits, which when the defendant bought was not more than 50 per cent of their face. Of course, if the claims were valid, such a discount could not be accounted for merely by the delays incident to collection. It is argued, however, that their validity was in dispute, and this is true. Yet no one disputed that the debtor members were in some form and to some amount

responsible for the coal they got. If the values actually fixed were too high, both credits and debits would be proportionately reduced.

Finally, it appears that the defendant knew that at least one of the debtor members was insolvent, and there were rumors about that several others were in doubtful condition. One may allow that a part of the discount was due to the uncertainty of what the final value of claims would be when allowed, and to the delay in their collection, but the whole situation was enough to put any reasonable man on notice of the truth, which was that under no circumstances could the exchange pay in full. Therefore, I hold that the set-offs are invalid under the Bankruptcy Act, and that the defendant can avail itself of them only as a creditor.

A. G. Hays Asks $35,000 Damages of Vinton Colliery Co.; Coal Police Indicted

ARTHUR G. HAYS, New York attorney, who went to the Pennsylvania coal fields last month as a representative of the American Liberties Union, filed suit in Supreme Court June 9 for $35,000 against the Vinton Colliery Co., of Vintondale, Pa.

Mr. Hays alleged that while standing on a street in Vintondale May 27 he was assaulted and "with undue force and brutality" dragged from the sidewalk into an automobile "by agents and employees of the colliery company." He named Lloyd I. Arbogast, secretary and a director of the company; John Butalla, Richard Esaias, Harry McArdle and James Dempsey, agents and alleged special police employed by the company. He asked $15,000 damages for this action, $15,000 for his subsequent arrest on a charge of trespass when he attempted to serve five warrants of arrest on Arbogast and the four guards and $5,000 for a later arraignment.

Indictments charging assault and battery were returned June 9 at Ebensburg, Pa., against Mr. Arbogast and the four coal and iron police mentioned.

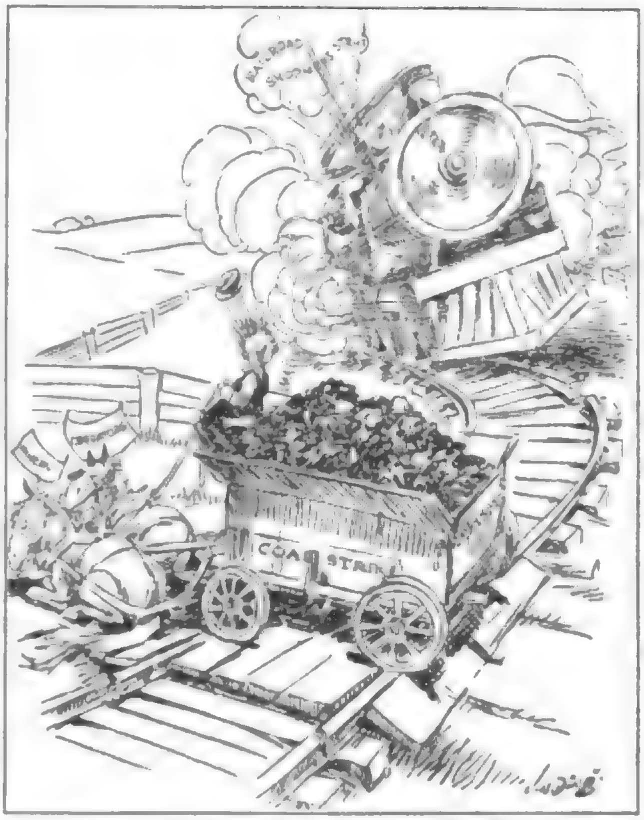
No Difficulty for Utilities If Non-Union Operators Observe Contracts

GEORGE H. ELLIOTT is in Washington to co-operate with the Secretary of Commerce during the coal emergency which has been caused by the continuance of the strike. Mr. Elliott has pointed out to Secretary Hoover that the gas and electric companies are not in dire straits. They not only laid in stocks in anticipation of the strike but fully protected their requirements by making contracts with mines in the non-union fields. Mr. Elliott has assured Secretary Hoover that the gas and electric companies will have no difficulties if they can get coal on their contracts. He called attention to the fact, however, that difficulties were brought about in the strike two years ago because many of the operators could not resist the temptation to sell their coal for the higher spot price, thereby making it impossible for them to furnish all the coal called for on their lower-priced contracts.

No steps have been taken by the public utilities to unify their purchases of coal due to the inherent difficulties of such action. There is such diversity in the kinds of coal required by the public utilities that unified buying would be a very complicated process. The situation will have to become much more acute than it is at present, it is believed, before the utilities will attempt to pool their buying with a central committee.

Expect Bunker Differential to Be Upheld

IT IS expected that the Interstate Commerce Commission will allow the present differential on coal for bunker purposes to continue. Following investigation of the bunker rates and their relation to rates for coal for local delivery in port, an examiner for the commission has recommended that the commission hold that the railroads have justified the propriety of the application of the rates on coal for transshipment to vessels for bunker purposes. He recommends that it be held that such rates, which are lower than the rates on similar coal for local delivery, do not violate the fourth section of the Commerce Act.



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DANGEROUS CROSSING; LOOK OUT FOR THE CARS!

Destination of Lake Cargo Coal Shipped During Season to End of April

NOTABLE features of the present lake season have been a decrease in the quantity shipped to Lake Superior destinations, both American and Canadian, and the extraordinary increase in the tonnage for southern Lake Michigan and for Lake Erie. Whereas in the corresponding period of 1921 no coal moved to Lake Erie points, in 1922 about 109,000 tons has been shipped through to Buffalo for use of the coke and steel plants there.

A summary of the destination of dumpings during the present season up to April 30, with comparable figures for 1921 and 1920, is given in the subjoined table, compiled by the U. S. Geological Survey:

DESTINATION OF CARGO COAL DUMPED AT LAKE ERIE PORTS FROM OPENING OF SEASON TO APRIL 30. (a)

	1920		1921		1922	
Destination	Net Tons	Per Cent	Net Tons	Per Cent	Net Tons	Per Cent
American						
Lake Superior ports	84,000	27.9	387,000	36.8	149,000	20.0
Sault Ste. Marie and river points	21,000	7.0	15,000	1.3	22,000	3.0
Lake Huron-Georgian Bay ports	30,000	9.9	18,000	1.7	21,000	2.9
Lake Michigan ports	76,000	25.1	344,000	32.7	328,000	44.4
Port Huron and Detroit River	44,000	14.6	26,000	2.5	13,000	1.7
Lake Erie ports	1,000	0.3	....	.....	109,000	14.9
Total American	256,000	84.8	790,000	75.0	642,000	86.9
Canadian						
Lake Superior ports	......	....	184,000	17.5	5,000	0.7
Sault Ste. Marie and river points	8,000	2.6	6,000	0.0	7,000	0.9
Lake Huron-Georgian Bay ports	12,000	3.9	19,000	1.8	24,000	3.3
Port Huron and Detroit River	10,000	3.5	20,000	1.9	29,000	3.9
Lake Erie ports	......	...	3,000	0.3	7,000	1.0
Lake Ontario and St. Lawrence River	16,000	5.2	29,000	2.9	24,000	3.3
Total Canadian	46,000	15.2	261,000	25.0	96,000	13.1
Grand total	302,000	100.0	1,051,000	100.0	738,000	100.0

(a) Statistics furnished by courtesy of Ore & Coal Exchange.

Production and the Market

Weekly Review

HESITANCY on the part of coal buyers, so noticeable two or three weeks ago at the inauguration of Secretary Hoover's price conferences, is fast disappearing. The consumer has reentered the market, largely in the belief that prices are to be kept within certain bounds. There is little speculation going on in coal and the trade as a whole is in a much healthier state than a few weeks ago.

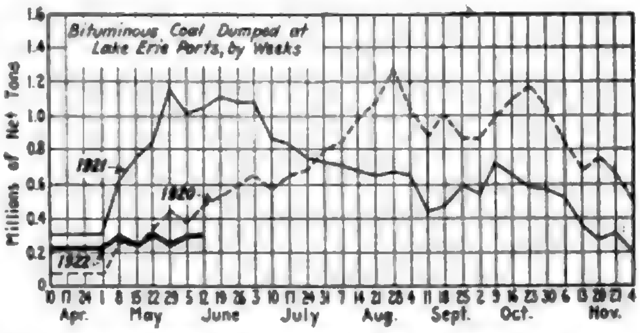
Prices have recovered from their recent slump. *Coal Age* Index of spot bituminous prices stands at 284 on June 12, an increase of 29 points as compared with last week's figure, and represents an average spot price of $3.44. Last week this average was $3.08.

The real test of the Hoover prices is coming. So far they have not been exceeded and in few cases equalled. But industrial requirements are increasing as business picks up, the Lake market has been backward—if a normal tonnage is to be moved it must be crammed into the remainder of the navigable season this year—stocks are everywhere going down and many consumers are undoubtedly "laying off" replenishing until they can obtain cheaper transportation after July 1. If these conditions bring on the expected degree of increased demand the good intentions of operators to hold to the Hoover prices will be put to a severe test.

Hampton Roads Prices Near Agreed Maximum

Hampton Roads prices have survived the avalanche of fuel destined to the piers in the last ten days. At one time there was nearly 600,000 tons on hand and en route to the Roads, which, because of the inactive New England and foreign markets, had to be absorbed by the bunker trade and Baltimore, New York and Philadelphia centers. These three coastwise ports received an unusually heavy tonnage and in the face of the easy movement of Southern coals quotations have strengthened to around $6.50 f.o.b. Hampton Roads, an increase of at least 50c. and close to the agreed maximum figure of $3.50 per net ton at the mines.

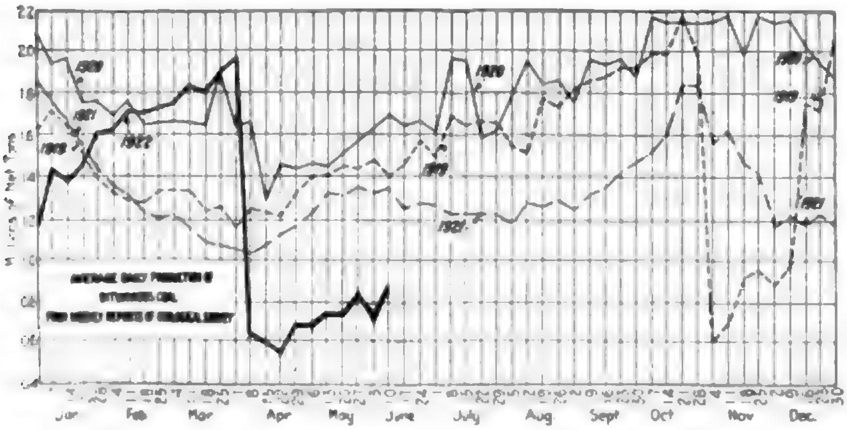
In the Midwest the demand is increasing daily, although it is confined for the most part to the larger users, who are again safeguarding their reserve piles. The railroad pool is active and there also are some roads buying in the market outside the pool for reserve tonnage. Western Kentucky operators could not agree with Mr. Hoover on their prices and are now selling their coal strong around $4.15. It is not likely to go much higher at an early date, however, as eastern Kentucky is selling competitively in many markets at the $3.50 maximum.



Connellsville producers also are enjoying a fancy market. The steel interests and other large users have bid up spot prices to $3.75@$4. Alabama coal is widening its distribution area, emergency freight rates to Western and Northern points normally served by fields now on strike having enabled operators to increase their output, although prices are within the limits recommended at the Washington conference.

Production is slowly gaining way. During the tenth week of the strike approximately 5,000,000 tons were produced, the increase apparently coming from Connellsville, eastern Kentucky, Tennessee and New River. The increased output, however, is not sufficient to stop the steady drain on consumers' stock piles.

Retail demand for anthracite is picking up and



Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1922	1921
May 20 (b)	4,481,000	7,989,000
May 27 (b)	4,889,000	8,166,000
June 3(a)	4,623,000	6,835,000
Daily average	771,000	1,330,000
Calendar year	167,121,000	165,541,000
Daily av. cal. yr.	1,280,000	1,270,000

ANTHRACITE

May 20	8,000	1,794,000
May 27	9,000	1,988,000
June 3 (a)	8,000	1,573,000

COKE

May 27 (b)	97,000	68,000
June 3 (a)	97,000	61,000
Calendar year	2,787,000	3,191,000

(a) Subject to revision. (b) Revised from last report.

many consumers are placing orders to be filled after the strike is settled. The retail yards are nearly out of the more popular domestic sizes. Steam trade is good on buckwheat No. 1, the only storage grade obtainable, and there is an active market also for the river coals.

BITUMINOUS

"Recovering from the holiday depression, the production of soft coal in the tenth week of the strike is expected to pass 5,000,000 tons," says the Geological Survey.

"In the ninth week of the strike (May 29-June 3) the combined effect of the Memorial Day holiday and of a pay day reduced production of bituminous coal to 4,623,000 tons. The output of anthracite was barely 8,000 tons, and the total quantity of all coal raised was 4,631,000 tons. A year ago production, including anthractie, was 8,400,000 tons; in the year before that, 11,100,000 tons, yet in neither of the years preceding was the output at this season normal, for in 1921 the business depression was at its most acute stage, and in 1920 the market demanded more coal than could be delivered.

"On Monday of last week (June 5-10) loadings were only 14,576 cars, but since then a steady increase has been reported. On Wednesday loadings passed the 16,000-car mark for the first time since the strike began, and on Thursday, June 8, another high record of 16,289 cars was set. The present indications are that the tenth week will exceed the eighth by at least 4 per cent, suggesting an output above 5,000,000 tons.

	First Week	Fifth Week	Sixth Week	Seventh Week	Eighth Week	Ninth Week	Tenth Week
Monday	11,445	11,598	13,118	13,366	14,772	15,082	14,576
Tuesday	11,019	12,160	13,266	12,830	15,085	11,142	15,115
Wednesday	11,437	12,861	13,445	13,422	14,677	15,097	16,005
Thursday	11,090	12,487	13,266	13,445	14,573	13,823	16,289
Friday	11,296	12,778	13,727	14,036	15,202	14,843	......
Saturday	8,888	11,265	11,454	12,357	12,662	12,865	......

"The largest elements in the increase revealed by the detailed returns of loadings on each railroad division appear to be heavier shipments from the Connellsville region, from eastern Kentucky and Tennessee, and from New River district. Other factors in the larger tonnage are the quickening of demand and consequently of shipments in the fields of the West which are now at work."

Receipts at the Head-of-the-Lakes docks have been very light, much of the coal dumped at the lower ports going to Buffalo. Duluth-Superior Harbor has received only 129,140 tons this year, as compared with 1,669,092 tons in the corresponding period of 1921 and 296,333 tons in 1920. Lake dumpings during the week ended June 12 were 293,405 net tons—283,821 tons cargo and 9,584 tons vessel fuel as compared with 300,312 tons in the week preceding. Dumpings for the season to date are 2,651,047 tons; in 1921 they were 6,903,274 tons. Prices are up at the Head-of-the-Lakes docks, demand is increasing and a serious condition may arise with any rush for coal, as dock stocks are much in need of replenishment.

All-rail movement to New England has been a trifle heavier during the last two weeks, showing the effects of heavier production. Coastwise freights are so low, however, that Southern coals will continue to dominate New England to the extent that they are available.

Hampton Roads dumpings were the heaviest of the year during the week ended June 8. A total of 472,300 net tons was dumped, as compared with 393,062 tons in the preceding week. New England is taking little but contract

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Apr. 1, 1922 inclusive	April 3 to May 27, 1922 inclusive	Week Ended May 27
U. S. total	45.6	55.7	....	....
Non-Union				
Alabama	63.5	64.6	73.6	78.4
Somerset County	55.5	74.9	48.0	17.1
Panhandle, W. Va.	55.3	51.3	39.2	43.4
Westmoreland	54.9	58.8	78.8	75.8
Virginia	54.8	59.9	76.5	88.4
Harlan	53.3	54.8	50.1	60.5
Hazard	51.7	58.4	59.4	71.4
Pocahontas	49.8	60.0	74.9	75.0
Tug River	48.1	63.7	80.8	88.1
Logan	47.6	61.1	75.8	81.6
Cumberland-Piedmont	46.6	50.6	15.2	24.7
Winding Gulf	45.7	64.3	70.3	80.2
Kenova-Thacker	38.2	54.3	78.7	87.3
N. E. Kentucky	32.9	47.7	59.7	68.5
New River‡	24.3	37.9	14.8	34.3
Union				
Oklahoma	63.9	59.6	14.4	12.0
Iowa	57.4	78.4	0.0	0.0
Ohio, Eastern	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	0.5	2.0
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	11.1	14.0
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	11.3	11.1
Fairmont	35.3	44.0	4.7	5.5
Western Kentucky	32.5	37.7	53.9	76.1
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	2.4	6.1
Ohio, southern	22.9	24.3	0.0	0.0

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

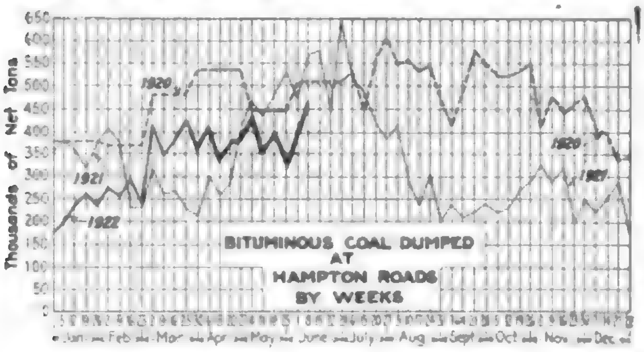
Low-Volatile, Eastern	Market Quoted	May 15, 1922	May 29, 1922	June 5, 1922	June 12, 1922†
Smokeless lump	Columbus	$2.85	$3.55	$3.35	**$3.75**
Smokeless mine run	Columbus	2.90	3.40	3.00	**3.50**
Smokeless screenings	Columbus	2.90	3.25	2.85	**3.00@ 3.40**
Smokeless lump	Chicago	2.90	3.40	3.10	**3.50@ 3.75**
Smokeless mine run	Chicago	2.70	3.15	2.85	**3.25@ 3.50**
Smokeless lump	Cincinnati	3.25	3.40	3.40	**3.50@ 3.75**
Smokeless mine run	Cincinnati	2.90	3.15	2.85	**3.25@ 3.50**
Smokeless screenings	Cincinnati	2.75	3.00	2.75	**3.00**
*Smokeless mine run	Boston	6.75	6.15	6.05	**6.25@ 6.50**
Clearfield mine run	Boston	3.25	3.15	3.20	**3.00@ 3.50**
Cambria mine run	Boston	3.75	3.65	3.65	**3.50@ 4.00**
Somerset mine run	Boston	3.50	3.40	3.15	**3.00@ 3.50**
Pool 1 (Navy Standard)	New York	....	....	4.40	....
Pool 1 (Navy Standard)	Philadelphia	3.95	....	....	....
Pool 1 (Navy Standard)	Baltimore	4.00			
Pool 9 (Super Low Vol.)	New York	4.00	3.80	3.90	**3.90@ 4.10**
Pool 9 (Super Low Vol.)	Philadelphia	3.75	3.60	3.90	**3.90@ 4.15**
Pool 9 (Super Low Vol.)	Baltimore	4.00	3.25	3.40	**4.00@ 4.50**
Pool 10 (H Gr Low Vol.)	New York	3.75	3.60	3.75	**3.90@ 4.10**
Pool 10 (H Gr Low Vol.)	Philadelphia	3.60	3.25	3.70	**3.50@ 4.00**
Pool 10 (H Gr Low Vol.)	Baltimore	3.75	3.25	3.35	**3.50@ 4.00**
Pool 11 (Low Vol.)	New York	3.65	3.25	3.60	**3.90@ 4.10**
Pool 11 (Low Vol.)	Philadelphia	....	2.75	3.25	**3.25@ 3.75**
Pool 11 (Low Vol.)	Baltimore	3.50	3.05	3.15	**3.50@ 4.00**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	....	3.10	3.65	**4.00**
Pool 54-64 (Gas and St.)	Philadelphia	....	2.75		
Pool 54-64 (Gas and St.)	Baltimore	....	3.00	3.25	**2.75@ 3.85**
Kanawha lump	Columbus	3.15	3.45	3.15	**3.50@ 3.75**
Kanawha mine run	Columbus	3.00	3.25	2.85	**3.25@ 3.50**
Kanawha screenings	Columbus	2.95	3.10	2.65	**3.00@ 3.25**
W. Va. split lump	Cincinnati	3.10	3.40	3.25	**3.50**
W. Va. Gas lump	Cincinnati	3.00	3.30	3.25	**3.50**
W. Va. mine run	Cincinnati	3.00	3.10	2.75	**3.00@ 3.50**
W. Va. screenings	Cincinnati	2.90	3.10	2.60	**3.00@ 3.25**

	Market Quoted	May 15, 1922	May 29, 1922	June 5, 1922	June 12, 1922†
Hocking mine run	Columbus	$3.15	$3.60	$3.10	**$3.50@ $3.75**
Hocking lump	Columbus	2.90	3.55	3.00	**3.25@ 3.50**
Hocking screenings	Columbus	2.85	3.55	2.85	**3.00@ 3.25**
Pitts. No. 8 lump	Cleveland	3.25	....	....	**4.00**
Pitts. No. 8 mine run	Cleveland	3.25	3.25	....	**3.00@ 3.75**
Pitts. No. 8 screenings	Cleveland	3.25	3.25	....	**3.00@ 3.75**
Midwest					
Franklin, Ill. lump	Chicago	3.95	....	....	....
Franklin, Ill. mine run	Chicago	3.95	....	....	....
Franklin, Ill. screenings	Chicago	4.15	....	....	....
West Ky. lump	Louisville	3.15	3.20	3.30	**3.75**
West Ky. mine run	Louisville	3.15	3.20	3.30	**3.75**
West Ky. screenings	Louisville	3.15	3.20	3.30	**3.75**
West Ky. lump	Chicago	....	3.10	3.40	**4.25**
West Ky. mine run	Chicago	....	3.10	3.40	**3.75@ 4.15**
South and Southwest					
Big Seam lump	Birmingham	2.00	2.00	2.20	2.15@ 2.25
Big Seam mine run	Birmingham	1.70	1.70	1.70	**1.75@ 2.00**
Big Seam (washed)	Birmingham	1.95	1.85	1.85	1.75@ 2.00
S. E. Ky. lump	Chicago	....	3.10	3.10	**3.75**
S. E. Ky. mine run	Chicago	....	3.10	3.10	**3.50**
S. E. Ky. lump	Louisville	3.15	3.10	2.85	**3.75**
S. E. Ky. mine run	Louisville	3.00	3.10	2.85	**3.50**
S. E. Ky. screenings	Louisville	3.00	3.10	2.85	**3.25**
S. E. Ky. lump	Cincinnati	3.00	3.30	3.25	**3.50**
S. E. Ky. mine run	Cincinnati	3.00	3.15	2.80	**3.25@ 3.50**
S. E. Ky. screenings	Cincinnati	3.00	3.15	2.75	**3.00@ 3.25**
Kansas lump	Kansas City	4.25	4.25	4.25	**5.00**
Kansas mine run	Kansas City	4.15	4.20	4.20	**4.00@ 4.50**
Kansas screenings	Kansas City	2.65	2.75	2.75	**2.80**

*Gross tons, f. o. b. vessel, Hampton Roads.
†Advances over previous week shown in **heavy type**, declines in *italics*.
NOTE—Smokeless prices now include New River and Pocahontas.

tonnage and the bulk of the spot coal is going to New York, Baltimore and Philadelphia, at prices which figure close to the $3.50 maximum at the mines.

Tidewater dumpings for May were curtailed by the strike, with the exception of Hampton Roads, which exceeded the April figure by 133,000 tons.



TIDEWATER SHIPMENTS FOR MAY, 1922
(In Thousands of Net Tons)

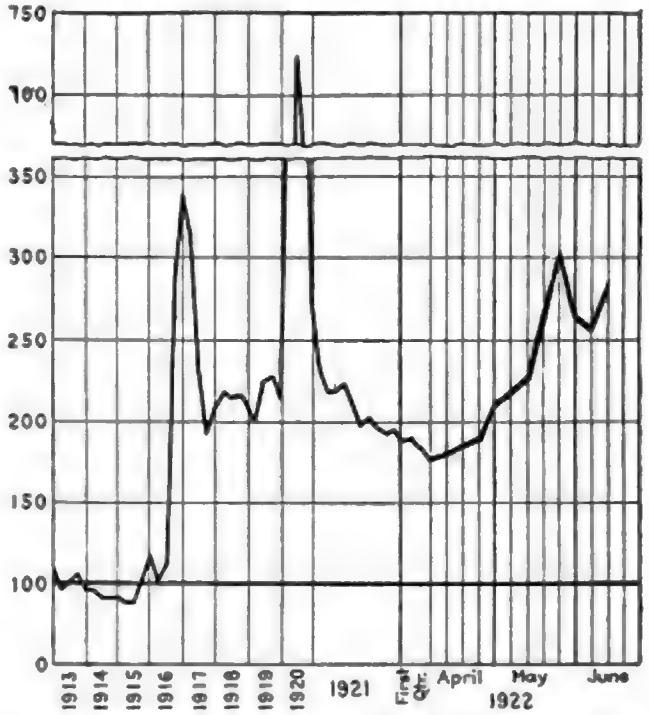
Destination	New York	Phila-delphia	Balti-more	Hampton Roads	Charles-ton	May Total	April Total
Coastwise to New England	16	7	...	768	16	807	873
Exports	...	10	...	140	7	157	302
Bunker	113	15	12	197	7	344	453
Inside capes	...	52	31	125	..	208	240
Other tonnage	135	...	...	493	..	628	675
Total, May	264	84	43	1,723	30	2,144	.....
Total, April	643	176	102	1,590	32	.....	2,543

COKE

Production of beehive coke was 97,000 net tons during the week ended June 3, being curtailed by the Memorial Day holiday. The decrease centered in the Connellsville region. Heavier production is expected to follow an increasing number of plants in blast. There is some Eastern buying of Connellsville coke, but the furnace demand is nearly as light as the supply, as the price of spot coke would not justify operations.

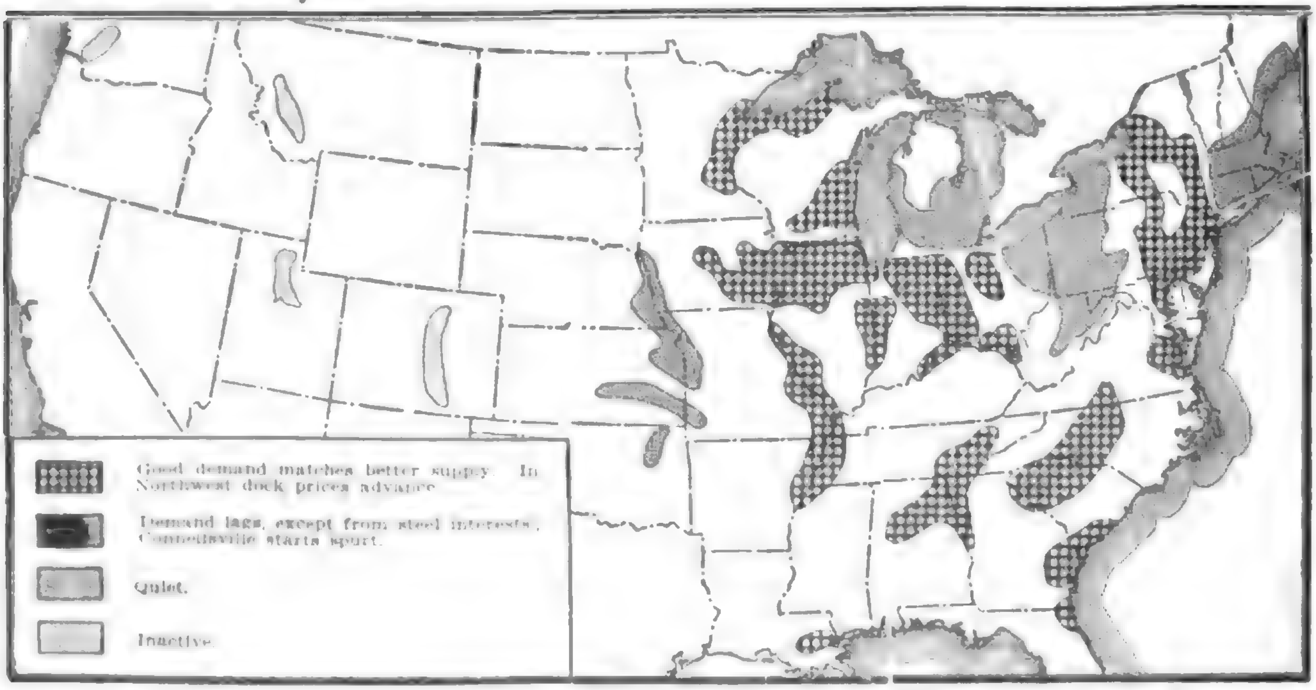
ANTHRACITE

Production of anthracite is still confined to approximately 8,000 net tons per week, this output being steam sizes dredged from the rivers. Producers continue to ship from their storage yards, but the movement is declining, as little but pea and buckwheat No. 1 remain unsold. In a few cases the smaller steam sizes are being held for old customers. The retail trade is a little more lively. Yards stocks are fast being depleted and orders are generally being taken for shipment after the strike.



Coal Age Index 284, Week of June 12, 1922. Average spot price for same period $3.44. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh District, Illinois and Indiana prices not included in figures for last week.)

Relative Activity of Markets for Bituminous Coal at End of Tenth Week of Strike


Good demand matches better supply. In Northwest dock prices advance.
Demand lags, except from steel interests. Connellsville starts spurt.
Quiet.
Inactive.

Foreign Market And Export News

British Production Declines Sharply; Market Is Quiet, but Good Orders Are in Sight

BRITISH production during the week ended May 27 was 4,630,000 gross tons as cabled to *Coal Age*. This is a sharp decline from the preceding week's output of 4,804,000 tons.

The market in the north of England is quieter than it has been for some weeks past. Inquiries are not frequent although the pits will be fully occupied for the greater part of June. The two most promising sources of inquiry are America and Germany, though very little has yet been shipped. Among the recent orders actually booked are 4,000 tons of special Wear gas coals at 29s. c.i.f. for the Bordeaux gasworks. Other small orders are for France and Italy.

In the Scottish market conditions are brighter. Scottish pits will supply 75,000 tons to the Danish State Railways at a price around 32s. f.o.b.

The Welsh market is unusually quiet. This inactivity is credited to the action of the buyers who are said to be withholding definite orders with the view of forcing down prices. There is still some considerable quantity of coal available, and this is due largely to the increase in output from the Welsh pits rather than to any slackening of the export trade.

While it is true that there are individual cases of hardship and privation among employed miners, and that some districts are feeling the pinch more than others, it is an exaggeration to say, as the miners' leaders maintain, that the entire mining community is in the depths of poverty. In terms of hard cash no marked disparity exists between the average miner's earnings and the cost of living scale. The average for all pit workers, skilled and unskilled men and boys, in 1914 was £6 10s. 11½d. Last March this average was £11 16s. 10d., which roughly equals the increase of 80 per cent in living.

Year's Record at Hampton Roads

Dumpings reached 472,000 net tons last week, the heaviest of the year. At the end of the week the piers were taking on increased business, with indications of still further increase.

Prices cover a wide range, with rapid fluctuations making it difficult to establish a fixed scale. Larger supplies of high-volatile coals was one of the features of the market.

The market is showing a tendency upward. Spot coal has taken control of the situation.

British Exports, April, 1920, 1921, 1922

Country	Gross Tons 1920	1921	1922
Russia	2,379	......	2,358
Sweden	76,034	19,223	196,255
Norway	54,711	16,471	154,810
Denmark	79,818	48,000	167,707
Germany	......	8,700	256,618
Netherlands	......	39,096	303,267
Belgium	89,810	5,823	221,563
France	953,809	119,285	955,346
Portugal	13,200	12,539	79,989
Azores & Madeira	27,649	......	14,853
Spain	8,088	31,268	147,083
Canary Islands	43,194	36	49,888
Italy	232,073	98,165	540,566
Austria Hungary	1,639	......	......
Greece	......	9,200	7,898
Algeria	63,502	15,602	93,176
French West Africa	27,087	......	5,455
Portuguese W. Africa	31,173	8,747	28,812
Chile	......	353	5,412
Brazil	31,499	9,818	68,249
Uruguay	5,536	11,766	50,955
Argentine Republic	8,314	31,375	180,447
Channel Islands	3,298	1,748	18,011
Gibraltar	123,558	7,918	59,812
Malta	14,780	11,582	13,798
Egypt	63,374	40,452	169,001
Anglo-Egypt Sudan	......	......	......
Aden and Depend	5,761	......	......
British India	......	10,545	98,912
Ceylon	......	3,883	26,393
Other countries	35,609	44,953	179,944
Total	1,995,895	606,548	4,096,578

QUANTITY AND VALUE OF EXPORTS, APRIL AND FIRST FOUR MONTHS

	Gross Tons April	First 4 Mos.
1920	1,995,895	10,361,664
1921	606,548	6,003,880
1922	4,096,578	17,333,082
	Value	
1920	£7,838,082	£38,324,153
1921	1,309,817	15,388,022
1922	4,650,455	19,665,529

Coal Paragraphs from Foreign Lands

GERMANY—Production in the Ruhr region during the week ended May 25 was 1,598,000 metric tons, according to a cable to *Coal Age*, as compared with 1,889,000 tons in the preceding week.

ITALY—The price of Cardiff steam first is quoted at 38s., according to a cable to *Coal Age*. Last week's quotation was 39s. 3d.

INDIA — The market is firm. Mills and railways are purchasing. Foreign coal is arriving. The Government has prohibited the export of coal under the Sea Customs Act except by the Crown or under permit from the Customs Collector for bunkering purposes.

BELGIUM—Sales are still insufficient, except in the case of certain best quality washed sorts. In spite of the increase in production sales of coke are easy. Domestic classed kinds of anthracite find a steady market. There is a slightly improved industrial call.

Hampton Roads Pier Situation

	Week Ended June 1	June 8
N. & W. Piers, Lamberts Point:		
Cars on hand	3,677	3,365
Tons on hand	195,892	179,235
Tons dumped	200,979	215,567
Tonnage waiting	59,600	20,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,711	1,588
Tons on hand	85,550	79,400
Tons dumped	92,101	120,957
Tonnage waiting	20,909	12,326
C. & O. Piers, Newport News:		
Cars on hand	911	2,274
Tons on hand	67,500	113,700
Tons dumped	67,869	85,173
Tonnage waiting	3,300	3,635

Export Clearances, Week Ended June 8, 1922

FROM HAMPTON ROADS:

	Tons
For Canal Zone:	
Am. S.S. Cristobal, for Cristobal	9,508
For Italy:	
Ital. S.S. Mincio, for Naples	6,910
Jap. S.S. England Maru, for Puertoferrajo	7,450
Dan. S.S. Nordamerika, for Puerta Chicama	1,295

Pier and Bunker Prices, Gross Tons

PIERS

	June 3	June 10†
Pool 9, New York	$7.00@$7.25	**$7.50@$8.00**
Pool 10, New York	6.60@7.00	**7.50@7.80**
Pool 9, Philadelphia	7.25@7.50	7.00@*7.50*
Pool 10, Philadelphia	7.00@7.25	6.60@*7.15*
Pool 71, Philadelphia	7.50	7.50
Pool 1, Hamp. Rds.	6.00@6.[illegible]	**6.75@6.65**
Pools 5-6-7 Hamp. Rds	5.50@6.00	**6.25@6.50**
Pool 2, Hamp. Rds.	5.60@5.80	**6.50**

BUNKERS

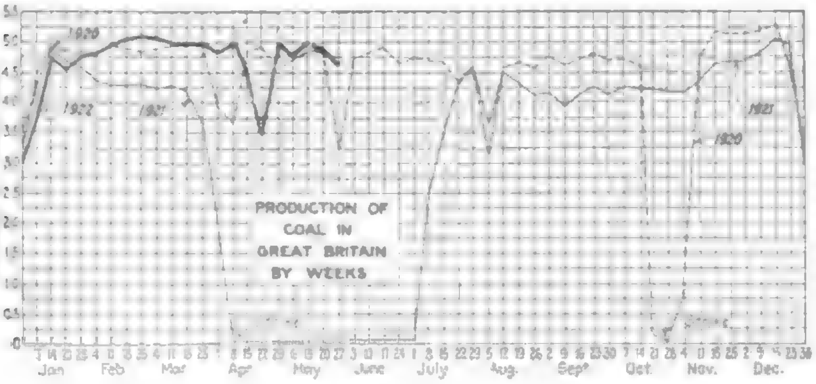
	June 3	June 10†
Pool 9, New York	$7.30@$7.55	**$7.90@$8.20**
Pool 10, New York	6.90@7.25	**7.80@8.10**
Pool 9, Philadelphia	7.40@7.85	7.25@*7.60*
Pool 10, Philadelphia	7.00@7.25	6.85@*7.20*
Pool 1, Hamp. Rds.	5.75	**6.25@6.80**
Pool 2, Hamp. Rds.	5.75	**6.25@6.80**
Welsh, Gibraltar	43s. f.o.b.	43s. f.o.b.
Welsh, Rio de Janeiro	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Welsh, Lisbon	43s. f.o.b.	43s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	43s. t.i.b.	43s. t.i.b.
Welsh, Messina	41s. f.o.b.	41s. f.o.b.
Welsh, Algiers	41s. f.o.b.	41s. f.o.b.
Welsh, Pernambuco	65s. f.o.b.	65s. f.o.b.
Welsh, Bahia	65s. f.o.b.	65s. f.o.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Malta	44s. 6d. f.o.b.	44s. 6d. f.o.b.
Welsh, Las Palmas	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Port Said	51s. 6d. f.o.b.	51s. 6d. f.o.b.
Alexandria	43s.	43s.
Capetown	35s. 3d.	35s. 3d.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	June 3	June 10†
Admiralty, Large	27s.@27s. 3d.	*26s.9d.@27s.*
Steam, Smalls	18s.6d.@19s.	*18s.6d.@19s.*
Newcastle:		
Best Steams	23s.	**24s.**
Best Gas	22s.6d.	22s.6d.
Best Bunkers	21s.@22s.	*20s.@21s.*

†Advances over previous week shown in **heavy type**; declines in *italics*.



North Atlantic

Many Inquiries for Delivery After July 1; Orders Scarce

Price Recovery Seen, Some Pennsylvania Coals Quoted Higher Now Than Before Hoover Conferences—Buyers Holding Back Till July—Movement from Roads Less Speculative.

PRICES have recovered from their recent weakness and in some cases Pennsylvania coals are quotably higher than before the Hoover price conferences. Demand is not greatly improved, as most consumers who are able to do so are out of the market until the July 1 freight reductions become effective. Many inquiries are in the market for delivery after that date, but commitments are few.

Southern coals are coming forward from Hampton Roads in undiminished volume, although the tonnage is not so much "on spec" as recently. The mine-price basis of these coals is being held to the Hoover figure, but Pennsylvania quotations are governed by supply and demand conditions.

NEW YORK

While demand shows no improvement quotations are changing rapidly. The low prices of late May are a thing of the past and the various grades are being quoted at much higher figures.

Large consumers are asking about shipments and quotations after July 1 when the new freight rate becomes effective, but when it comes to actual business as a result of the inquiries there is little doing.

While there were in the neighborhood of 2,000 cars at the piers at the end of the week most of it was already sold and only awaited an order for delivery. With the prices fluctuating as they now are the speculator is not apt to take many chances of being stung with high-priced coal, and for that reason is not bringing much coal to the piers to await buyers.

Heavy tonnages of Southern coals are coming forward but most of it has already been purchased. Quotations for these coals range $8@$8.25, alongside.

CENTRAL PENNSYLVANIA

Production increased slightly last week. Most of the increase comes from the small mines in the vicinity of Punxsutawney and in the non-union fields of Somerset and Cambria. At the wagon mines in the vicinity of Cresson miners have left their work, owing to alleged threats from agitators.

President John Brophy returned last week to his headquarters at Cresson from New York where he conferred with union officials. He had nothing to say about the outlook, although he expressed hmiself well pleased with the decision of the Supreme Court on the Coronado case, saying that it would release large sums of money which would be available for use in the present strike.

UPPER POTOMAC

More men are now at work in the Upper Potomac territory than at any time since the strike was declared. Approximately 20,000 tons a week are now being loaded and shipped. Although the output in the Georges Creek field is not large, headway is being made in the operation of mines. There was a decided stiffening of the market in the week ended June 30.

FAIRMONT

With further gains in the number of mines at work during the first week of June, it was possible to still further increase the output. The average number producing was 143, the highest yet reached, as against about 60 when the strike began. After the second Washington price conference, buyers were again in the market and prices began to mount, soon reaching the maximum of $3.50.

PHILADELPHIA

There is much comment on the fact that prices on Pennsylvania coals have not as yet been fixed. A considerable portion of the operators are holding out for $4.50, and while a compromise at $4 is spoken of, there seems to be a determination to hold out for the top price.

The consumer who is holding off and eating into his stock seems to be in for something of a shock, as there does not seem the least probability that he will be able to buy coal below $3.50 during the balance of the strike.

As to the probable duration of the strike there are some operators who are actually sincere in stating their belief that it will last at least until Sept. 1, and some even put it two and three months beyond that time. It is understood that some real efforts are being made to treat with the miners in certain Pennsylvania fields, on the basis of a new scale. Thus far all the overtures of the operators have been repulsed by the miners, who are still insisting on a general agreement for all four states.

Prices have inclined to stiffen on such coals as are available. Pools 1 and 9 grades are scarce and difficult to get. The railroads have lately been taking some Pool 11, but are still inclined to keep out of the market, although they are cutting heavily into their stock piles and must soon come into the market for greatly increased tonnages.

BALTIMORE

Rising sharply, and in most regions going 50c.@$1 above the Hoover maximum prices, the market is most interesting from every viewpoint. Consumers are now insistent on getting coal and are not paying so much attention to price as to the ability for reasonably quick delivery.

In relation to prices the condition is largely one of regional action. For instance, the operators on the C. & O. and Norfolk & Western are sticking pretty close to the Hoover maximum; some of the West Virginia operators have apparently never heard of Hoover while the Pennsylvania operators claim that they have not received a price list and are therefore selling on the basis of supply and demand.

The demand in this section is growing by leaps and bounds, especially since many consumers are regarding as a strong possibility transportation troubles on the railroads after July 15, due to labor demands. This has also caused ocean freight rates to rise, as consumers in position to take advantage of water-borne coal, in the event of all rail complications, are endeavoring to cover themselves. While the demand is heavy there is not much coal coming East and this applies especially to high-volatiles.

West

DENVER

A few dealers are buying coal now in large quantities. The majority are waiting for the July freight rate reduction. "We'll be swamped with business beginning July," is the expression of most of the operators. Strike conditions remain unchanged.

Present quotations are: Trinidad lump, $4, nut, $3.75 and mine run, $3.50; Walsenburg district, lump, $5, nut, $4.50, slack, $2, mine run, $3.50. The supply of slack is practically exhausted. Northern first grade lignite is selling at $4 a ton and second grade $3.50. Mine run is bringing $2.75 for first grade and $2.25 for second grade. Slack is quoted $1.50@$1.75.

SALT LAKE CITY

Hoover prices on coal are in control of the market, operators at a recent conference, having agreed that they will abide strictly by the Secretary of Commerce's plan and that there will be no profiteering. The demand for slack is still brisk, but there is not much call for the better grades. The public is still indifferent as to the outcome of the strike. Whether a storage rate will be made this year as was fixed in 1921 is not known yet. Most of the dealers are well supplied for the summer trade and are showing no disposition to stock up.

KANSAS CITY

No change in the conditions generally is noticeable. Small mines in Kansas and Missouri supply all the emergency coal needed. In addition the mines in New Mexico are offering all grades of coal. Mines in West Virginia also are offering coal here.

Prices show a wide range but the ruling prices are about as follows: Kansas lump, $5; mine run, $4@$4.50; slack, $2.85. Little or no lump and slack are on the market.

Wheat harvest has started in Kansas and the crop promises to be equal to that of 1918, which was the record year. Business generally shows some improvement.

Anthracite

A Modest Retail Demand Makes Its Appearance

Yard Stocks Getting Low, with No Replenishment in Sight, Except Pea, Which Moves Slowly—Producers Hold Steam Tonnage for Large Consumers —River Coals Active.

A SLIGHT demand at retail is becoming noticeable. Heretofore orders were confined to immediate needs, but lately consumers are placing orders with the request that shipment be made, at least in part, from present yard supplies. Retailers' stocks are getting low and no replenishment tonnage is available, with the exception of pea coal, which is moving slowly.

Buckwheat No. 1 is the only steam size available. Some steam tonnage is being held in storage for large consumers by the producers. River coals are very active and prices are strong.

BUFFALO

No stir of account appears anywhere. An occasional emergency call for a ton or two is promptly filled and that is all. One would suppose that some sort of uneasiness would be apparent after ten weeks of standstill, but there is none. The operators have studied in vain on plans for stimulating buying in warm weather. They have at least not had to do that this summer, but they have had a bigger problem on hand. If they have made any progress now it is not given to the public. For once the public seems willing to wait to the limit, for in getting the best of the strike seems to lie the only chance of getting cheaper coal.

It is plain that the operators are in position to hold out till fall. Are the men as well situated? It looks like the striking of an immovable object by an irresistible force.

NEW YORK

Because of the heavy demand for buckwheat No. 1, pea is about the only size obtainable at Tidewater. Buckwheat tightened considerably the past two weeks and the stocks have been very much reduced.

While the wholesale market is practically bare of supplies, retail dealers are not scurrying around for coal. Most of them have fair stocks in yards and for the most part are delivering all orders.

The consumer has not yet publicly acknowledged the strike. If the reverse is the fact it is not noticeable. There is no anxiety being shown by consumers and retail dealers are not being given sufficient orders to keep their employees busy.

Producers have considerable buckwheat in storage but much of it is being reserved for railroads and other large consumers. Wholesale dealers receive many inquiries for rice and barley but cannot fill them. There was some river coal offered here last week.

PHILADELPHIA

As a good many families are departing from the city for the summer the retailers have received quite a number of inquiries for coal lately, and some of their customers for the first time seemed to realize that the strike is really a serious condition.

Offerings of even occasional cars of prepared sizes seem to have disappeared entirely, indicating that storage stocks are entirely cleaned up. There is a feeling among many dealers that even yet it is possible to obtain some family coal, but they are finding out that there is nothing to be had.

All spring some dealers, being certain that the strike was only a matter of weeks, have been promising delivery to their regular summer trade as soon as the strike is over. It is believed if the suspension lasts another month, more than one dealer will find it extremely difficult to get sufficient coal when the mines resume.

The companies still have fairly good steam stocks in storage, but they advise inquirers that every ton has practically been sold and is covered by orders already on their books from old customers. The river coal people are making stronger efforts than ever to market their fuel and new business is being closed daily. Most of the offerings are on barley at $1.75@$2.50.

BALTIMORE

Dealers report that interest is at last stirring among their consumers, after having held off from ordering entirely this spring because they were convinced that coal would be sold at prices below the last winter's schedule, which is still in force. Dealers are getting an increasing line of inquiry as to whether they will be able to supply the coal a little later in the season if actual orders are not placed at this time. Few of the dealers are in a position to deliver any material amount at this time. No hard coal is coming through and the supply in yards is rapidly dwindling under deliveries to consumers who are regarded as emergency cases.

BOSTON

Retail demand is so much improved that in the cities the dealers are beginning to limit the deliveries they will make on orders. In certain of the smaller communities the retail dealers are even now without one size or another and all the indications are for a steady increase in the volume moving until through lack of supply the dealers are forced to decline further deliveries.

Small amounts of chestnut are still coming through from storage piles in Pennsylvania but this is confined to a very few producing companies. Most of the latter have only pea and buckwheat in reserve.

Retail prices are unchanged, and are not likely to be modified until mining is resumed, although pea at $12 still does not allow much margin to the retailer, who is obliged in some cases to pay well in excess of $6 per gross ton f.o.b. shipping point.

ANTHRACITE FIELDS

There seems to be a considerable difference in the way the leaders of the union are talking and the way the men themselves talk. The leaders seem to be holding firmly for an increase in wages, but the men themselves appear willing to take a small cut.

The leaders are taking a vote asking the men to authorize them to declare a strike if they see fit. Of course, there are men who would want a strike, but they are in the minority. Many of the newspapers in the region have come out with editorials stating that the men should accept the fair offer of the operators.

South

VIRGINIA

Mines are producing at the rate of about 90 per cent of potential capacity. "No market" losses have been reduced to almost nothing. A shortage of labor alone is about all that stands in the way of capacity production, unless it be a car shortage, such being in evidence only on the Norfolk & Western and the Southern. Buying during the first few days of June was on a heavier scale than ever and prices were climbing toward the maximum agreed upon at Washington.

BIRMINGHAM

Business is gradually coming from districts where the coal supply is affected by the strike. Mines in Walker County and other points in the western section of the field in a position to ship through the Memphis gateway advantageously, have booked a considerable tonnage during the past week. Most of the coal bought was for railroad use, although there were some orders taken for industrial interests. Inquiry is good and several deals are pending calling for a large quantity of coal to be shipped into the West.

The Missouri Pacific bought from 500 to 750 cars in addition to the business previously placed in the district. Trade in normal territory is reported as slightly improved.

There is no demand for domestic sizes outside of the better grades. Cheaper coal is hard to dispose of as the steam market is not strong enough to absorb it.

Quotations, unlike those in many of the other non-union fields, were not disturbed by the Hoover schedule as agreed on for Alabama, as prices of all grades were and are now much below the maximum fixed.

Production is again up to the high figure which was reached and maintained for quite a while recently, approximately 325,000 tons per week. Some labor is leaving the district, but as yet there is no shortage reported.

Chicago and Midwest

West Kentucky Climbs Fifty Cents in a Week

Advance May Stop at $4.25, However, for Eastern Kentucky Remains at About Hoover Level of $3.50—Alabama Is Shipping Into the North.

THE steady advance of western Kentucky coal throughout the Midwest region to a height of $4.15, with prospects of going even a little higher, got the market spotlight during the past week. The question everybody asks is: "Where will it stop?" Wise men of the trade think it will stop soon for eastern Kentucky is holding to the Hoover prices and the price spread between the two ends of the bluegrass state may have reached its limit for the present.

With the market at this level, Alabama coal is beginning to have a chance at Northern business other than that of railroads. A good deal of this coal is in St. Louis and it may soon be moving in some volume to Chicago or even into the Northwest.

Demand for coal is growing constantly stronger, indicating a swiftly awakening interest on the part of a good many consumers in addition to the railroads. The railroad pool has bought some large shipments lately. This occasional emptying of certain markets has sent slight panicky flutters among some classes of consumers, but it can be fairly said that coal trading is in a reasonably healthy state, with little speculating going on. There is enough business afloat to provide a living for practically all of the legitimate concerns and enough coal available to supply all of the demand.

Retail trade is stagnant. Hard coal in storage is low but prices have not moved noticeably. The mining fields of Illinois and Indiana are quiet, with considerable repair work progressing at many properties and good feeling prevailing generally between operators and men.

CHICAGO

Marked advances in western Kentucky prices featured the coal market during the past week. Coal which began the week at $3.50@$3.65 had accomplished an increase of exactly 50c. by the close of business Saturday noon, leaving the top price at $4.15. It was prophesied by a number of men active in the trade that the ascent could not continue much longer. Plenty of eastern Kentucky mine run is available on this market at $3.50 with slack at $3.25 and lump $3.75. These prices are not going to rise, eastern Kentucky producers say. They propose to stick to the "gentlemen's agreement" with Mr. Hoover—though F. S. Peabody, one of the biggest Western operators has publicly declared it to be his belief that "where competition is keen, there can be no such thing as a "gentlemen's agreement,'" If they do stick, it is assumed the market will not stand for a greater spread between eastern and western Kentucky coals than is effective now.

Buying is brisk in some quarters for railroads are urging their fuel committee to secure heavy tonnages for them. It is so brisk, in fact, that those of the railroads who have been disgruntled with the pool plan from the start are now doing some buying outside at whatever they must pay. A good many other big consumers are taking a wide-awake interest in coal. Inquiries are so numerous that they plainly show the tremulousness that exists in certain breasts over a possible shortage.

Only small quantities of West Virginia fuel penetrate this far west. Contract buyers and regular customers absorb practically all of this eastern coal at varying prices. Smokeless which actually gets into the open market goes at $3.25@$3.75. Anthracite is getting low, especially on the larger sizes. The emptying of the dock storage of this coal is beginning to worry dealers around here, who had counted on getting some of it, but the price has not advanced.

WESTERN KENTUCKY

Western Kentucky not being able to reach an agreement with Mr. Hoover over the maximum price of coal, has decided to go right ahead on its own maximum basis of $4.25, regardless of what any other fields may do. That maximum may be reached soon. Whether the market will stop when it hits that level is a question.

Operators have not been especially pleased with press reports, which indicated that western Kentucky wished to force high prices. The fact that west Kentucky is a union field, paying the peak union prices, as against 1917 levels in some other operating fields, has not been given proper consideration in Washington, nor the fact that it is a pit field, where costs are greater than in operating drift mines.

Demand is picking up, there being a good demand from Chicago, Detroit, and through the C. F. A., and Central Northern districts, with some river movements. The fact that western Kentucky is quoting $3.75 for all sizes, instead of $3.50 mazimum for mine run and $3.75 for prepared and $3.25 for screenings in other fields, would not indicate that she is getting as much for her coal now as the other fields, comparing production cost.

LOUISVILLE

Since the first of June demand has picked up again and prices are fully recovered to the peak values quoted in late May prior to the slump. Western Kentucky is quoting $3.75 on all sizes and expecting $4 soon. Eastern Kentucky is quoting a $3.50 mine run basis, with $3.75 for prepared and $3.25 for screenings. However, there are any number of eastern Kentucky operators not affected by the conference in Washington, who are expected to ask all that the market will stand.

Demand is much stronger generally, with an increased demand from many Northern and Eastern points, as shown by the fact that Alabama fuel is moving north to Pittsburgh and Chicago. It is believed that in spite of reduced freight rates effective July 1, tonnage will move quite freely until that time and even better thereafter.

SOUTHERN ILLINOIS

Quiet prevails throughout the entire field. There is no commercial coal left in the Carterville district but a little still remains on track in the Duquoin field, held for contract.

The unmarried miners still continue to leave the districts and it is rumored that many of these are going to the non-union fields in the south. The miners seem pretty well contented to play the waiting game, although in sections they are anxious that something be done to relieve the situation.

In the Mt. Olive district the coal is pretty well cleaned up. There is, however, a big tonnage on track held in reserve for the City of Chicago and some little additional coal held in reserve for contract customers.

In the Standard district it is rumored that there are still about 4,000 tons in reserve and this is being doled out at $4.50 for both steam and domestic.

ST. LOUIS

There is a little activity in steam, principally because the supplies are running low. For the first time Alabama this week came into the market on a rate of $4, with a mine price of $1.65@$1.75 for mine run. The latter part of the week this jumped up to $1.85@$2, occasioned by the railroads going into the west Kentucky field rather strong. West Kentucky here ranges $3.75@$4.

Railroad business seems to have been the big factor, but this tonnage was not moving this way. The Missouri Pacific is reported in the market and the Frisco is bringing in coal from Alabama. It is understood that one division of the Frisco below Springfield is going over entirely to oil on a contract for three years.

There is no domestic activity except in a little coke and a little smokeless. Country business is quiet on domestic, but there is some little demand for threshing coal.

Canada

TORONTO

Trade shows some improvement with a slight increase in the demand for both anthracite and bituminous and stocks on hand are diminishing. There is some shortage of stove coal but good supplies of other grades. Receipts of bituminous are tight, but about equal to the demand. Consumers are anticipating lower prices on the termination of the strike and orders are generally limited to immediate requirements.

Quotations are as follows:

Retail:	
Anthracite, egg stove and nut.	$15.50
Pea	14.00
Bituminous, steam	9.25@9.75
Domestic lump	11.25
Cannel	16.00
Wholesale, f.o.b. cars at destination:	
3 in. lump	9.25@10.00
Slack	8.00@8.75

Northwest

Dock Stocks Melting Prices Mount Steadily

Receipts Throughout Northwest Fall Far Short of Normal—Railroads Buy Big Tonnages but Small Consumers Do Not Fret about Anything.

DOCK stocks throughout the Northwest continue to melt steadily before the purchasing advances of a few big buyers, principally railroads. Prices have firmed up and in some cases have advanced with every prospect of going higher. Receipts by vessel are far short of normal so that as things stand, the Northwest may yet face a serious situation. However, the average small consumer is paying not the slightest attention to the strike situation or the disappearance of the storage piles from the docks. Nothing seems to disturb his equanimity, although it cannot be denied that the scene is all set for a buying rush that may cost a good many people a great deal of money.

MILWAUKEE

All grades of soft coal have been advanced 50c.@75c., because of the growing cost of replacement. If conditions continue unchanged as far as the strike is concerned other advances are bound to follow.

The market is extremely quiet, the demand being confined to large consumers of soft coal. There is practically nothing doing in anthracite. Domestic consumers are naturally unconcerned over the fuel situation at this season of the year. Coal keeps coming by Lake, but the total receipts thus far this season are far behind the record during the same period last year.

MINNEAPOLIS

Considerable publicity in the daily press as to the probable situation has appeared and should have some effect toward stimulating buying. But so far as can be observed, it has had no effect yet. The only buyers who seem to be alarmed about the situation are the larger consumers, railroads and public service corporations, who have been quietly contracting for coal for some time.

Perhaps 15 or 20 per cent of the soft coal on the docks has been contracted by railroad buyers. But that tonnage will still be a part of the total for the current year, whatever that may be. And the remainder of the carryover has not entirely disappeared. Several dock companies have withdrawn quotations. They have about exhausted their supplies.

The Northwest will need a heavy tonnage during July, August, September, October and November, if there is to be the customary supply of coal on the docks. But it is not yet assured that this will not be available. If a real scramble for coal were to be started it would speedily absorb what coal is available, and create a booming market.

Recent sales of considerable tonnage to railroads have removed the excess stocks on the docks, and several concerns are out of the market. Others are holding dock run at $6.75 f.o.b. dock, and lump at $7. These prices simply mark a return to the regular run of prices, which had been sharply shaded because of excess stocks and no demand. It would not be surprising if there would be public criticism that the strike has increased prices sharply.

DULUTH

A steady market of $7.50 for lump, $7 for run of pile, and $5.50@$6 for screenings is confidently expected by dealers before another week has passed. Indications point to the fact that this will by no means end the price rise even if the strike should be settled soon—a thing which seems impossible.

Accurate figures of the free coal on docks are not available at present, but the amount is known to be smaller than is generally believed and totally inadequate to take care of the needs of the section of the country which depends upon Duluth-Superior for its supplies.

Receipts at docks during May aggregated only 93,971 tons of bituminous, bringing the total to May 31 up to 133,702 tons, 129,140 tons of bituminous and 4,562 tons of anthracite. Only eleven steamers arrived during the month as compared with 173 during May last year. Hard coal receipts showed a decrease of 251,686 tons and soft coal receipts dropped 1,539,952 tons as compared with last year.

Official figures to June 1 show that there have been shipped down to Lake Michigan and near-mine ports from Duluth-Superior harbor 59,300 tons of coal. Since compilation two more boats have loaded but not cleared. The larger portion of this coal was taken by the Chicago, Milwaukee & St. Paul R.R. That the railroads are becoming nervous regarding the fuel supplies is regarded as shown by the heavy shipments that are being made from their docks here to their fueling depots throughout the Northwest and elsewhere. Shipments from the docks aggregated 18,587 cars during May, as against 9,826 cars during April and 7,883 cars during May last year.

Large operating concerns are also buying. United States Steel subsidiary corporations are in the market, as are independent iron mining companies. Dealers are sitting tight, however, and are waiting for the reduction in freight rates, due July 1.

Screenings are virtually cleaned out. Anthracite is dead, but the scarcity of supply and the certainty of a shortage unless the strike ends before the first of August, is maintaining price levels.

New England

Light, Scattered Buying Has Slight General Effect

Tendency to Hold Back Due to Washington Advices and Nearness of Lower Freights—Resumption of Textile Mills Has no Immediate Reaction.

THE week shows no material change in the general situation. Demand in this territory is extremely light and except for scattering purchases there is almost nothing doing. Naturally, buyers are influenced both by news items from Washington and by the 10-per cent reduction in freight rates, which now is only a fortnight or so ahead. Southern coal prices are wavering and the coastwise movement is now mainly on contract.

Certain of the textile mills resumed June 5 but only a small beginning has been made and the coal market is not likely to show any reaction for several weeks to come.

Prices both at this end and at Hampton Roads have no real stability; $8 on cars has been named for No. 1 coals in small lots, while a larger order will gladly be accepted for $7.50. We have heard no actual sale at less than $6.25 f.o.b. Roads, but we are given to understand that firm offers at $6.00 would be accepted. Neither New York bunker contractors nor large industries in the West have purchased recently to anything like the extent that prevailed three weeks ago, and in consequence there seems ample fuel available at the Virginia terminals. Spot quotations of Pensylvania coals are shown in the Weekly Review.

Accumulations have further increased at Hampton Roads. There are still 60-day reserves here with practically all the large users, railroads and utilities as well as mills, and there is today no indication of any accelerated demand during June or July.

All-rail receipts have increased a little, due to somewhat larger output in central Pennsylvania, but this will hardly be sustained through the month. Coastwise freights have settled down to a cost-plus basis and there is no question that Hampton Roads coals will continue to dominate this market through the balance of the season to the extent that they are available. Even with the 10 per cent reduction in July all-rail coal will still be handicapped for a market in New England.

Eastern Inland

Activity of Steel Buyers Stiffens Connellsville Prices

Other Markets, Where Hoover Recommendations Apply, Softer—Demand Quiet Pending Effectiveness of Lower Freights—Conditions Presage Heavier Call and Possibly Prices Above Hoover Level.

STEEL buyers are active in the Connellsville region and prices are strong. As this section is not covered by the Hoover price recommendations operators are experiencing a rising market and spot quotations have fully recovered from their recent slump. Other markets are not so strong. Demand is quiet, as buyers await freight reductions after July 1.

With the shortened Lake season, dwindling reserves and heavier industrial consumption the market will soon call for a larger tonnage. When that time comes prices may exceed the limit fixed by Mr. Hoover if the demand becomes insistent enough.

PITTSBURGH

Under date of June 9, the Pittsburgh Coal Producers' Association addressed a letter to Robert R. Gibbons, president of District No. 5, U. M. W., reciting that on March 13 the association had proposed a scale conference, which on March 16 the local of the miners had refused, pointing out that by this time it must be apparent that the Pittsburgh operators will not join in a four-state agreement and suggesting that a scale conference now be held.

Trading is confined practically to Connellsville coal. The Connellsville operators have evidently failed to reach any agreement with Secretary Hoover as to price limitation. Right along report has had it that they desired a maximum limit of not under $4.50.

Buying of Connellsville coal by steel companies has increased. The market is up fully 50c., being now quotable at $3.75 for steam, with occasional sales at slightly higher figures. There does not seem to be any regular byproduct on the market, and it is said that coal from some mines, formerly of byproduct quality, would no longer pass muster on account of loose work on the part of the men.

COLUMBUS

Buyers are now laying low until after the reduced freight rates are effective. As a result only a fair tonnage is moving and that is designed to take care of cases where there are no reserve stocks. The best buying is now being done by railroads and public utilities with the latter taking a pretty fair tonnage. Quotations are around those fixed by Secretary Hoover's conference.

Retailers are only buying in limited quantities as their stocks are good and demand is at a minimum. Dealers are trying to clean up their stocks before lower freight rates reduced prices. Householders as a rule are not stocking up to any extent as they are waiting for conditions to be settled.

Shippers believe that buying pressure will come after July 1 and that higher prices will offset the lowered freights. Then the Lake trade is going to complicate matters and unless shipments are started soon there will be a big tonnage to be made up later on.

EASTERN OHIO

Inquiries for fuel have noticeably diminished. There is little urgent demand and the supply available is ample to meet current needs. In the face of slow demand, prices have stiffened somewhat approximate maximum figures resulting from the recent Hoover conferences.

Lack of demand is accounted for by reserve stocks sufficient for some weeks yet. Likewise, a reaction from present prices is looked for because of the prevailing apathy in demand.

In the Lake trade, coal is being dumped about as fast as it is coming forward and Toledo and Sandusky are handling practically all of the cargo coal at the present time. Lower docks handled during May 1,304,281 tons of cargo coal and 380,111 tons of fuel for vessels, making a total of 1,341,392 tons. Coal forwarders predict that the requirements of the Northwest cannot be filled during the remainder of the Lake season and that it will be necessary to forward a considerable quantity of coal to the Northwest by rail, which factor will contribute in no small degree to intensify a car shortage.

Eastern Kentucky and West Virginia mine run, slack, nut and slack is $3.25 @$3.75, with lump around $4. Receipts at Cleveland during week ended June 3 were the smallest in quantity since late April, amounting to 967 cars. This volume is 545 cars under the average weekly receipts during the first quarter of the year.

DETROIT

Very little interest is being manifested in the market. Apparently most of the large steam consumers are still comfortably fixed in the matter of reserve stocks. The freight rate reduction is held to be a leading factor in withholding orders at this time.

Wholesalers and jobbers are warning their customers that there is likely to develop a volume of demand after July 1 that will be greater than the mines will be able to satisfy. The point is emphasized that those now holding back may find they are obliged to pay a price at the mines that will more than counterbalance the reduction in freight charges.

Expression is given among some to the thought that conditions at present, with almost no buying demand and coal in apparently adequate supply, do not constitute an emergency justifying efforts of representatives of the government to arrange a maximum price agreement.

CLEVELAND

All other phases of the coal situation have been subordinated to the efforts of coal operators to find some basis upon which they can agree to start negotiations with the unions for ending the strike. In order to accomplish this they are willing to grant the men the check-off system, and probably would not hold out for such deep wage cuts as were talked of a few months ago.

The work of the operators favoring strike settlement, with some compromise, if necessary, has encountered opposition on the part of the Pittsburgh owners. These are said to oppose the check-off and to be disinclined to any compromise to the unions.

Upper lake docks are being swept bare of coal and demand from that quarter soon will be insistent. To June 1 only about 1,991,000 tons had been loaded at lower ports and only 1,491,000 of this went to the Northwest. This movement compares with 4,669,000 tons for the same period of 1921. With more than two months of the Lake season gone, congestion seems almost certain unless production on a big scale is resumed shortly.

Starting with stocks of 63,000,000 tons at the beginning of the strike industrial supplies are now estimated around 30,000,000 tons, with famine conditions looming once the level gets below 20,000,000 tons. That point is expected to be reached, with present increased industrial activities, by July 1. For the moment the situation is not acute, but nothing can prevent its becoming so if production is not resumed soon.

BUFFALO

For the first time come reports that this or that consumer is getting out of coal. The fact is that the proceedings fail to proceed. Secretary Hoover's fixing of certain prices, although it stopped the advance for the time, does not appear likely to keep them down long. The tendency is upward. Certain members of the trade point to the increasing output, but they admit that the consumption is increasing also.

The confident operator is still looking for the creeping back to work that he saw in the air and he further predicts a stampede before long, but he does not really have any facts.

The price range is from $3.25 for mine run in general to $3.50 for slack and three-quarter, slack being scarcer than anything else. If anyone has even semi-gas coal he can sell it for $3.75, mine price.

The receipts of grain from the Upper Lakes continue in large volume. The fleet looks for ore and coal to offer in large amounts late in the season. Bituminous coal from West Virginia via Ohio ports amounted to 508,710 net tons to June 1. For the past week the receipts were 85,700 tons.

NORTHERN PANHANDLE

Trial of a group of strikers on the charge of having violated an injunction has prevented further acts of violence. During the week ended June 3, the mines produced a heavier tonnage than had been possible during the greater part of May. A better market was also a contributing factor in the increase.

Cincinnati Gateway

Railroads and Steel Mills Help in Recovery of Prices

Recent Scurry Forced Quotations on High Volatile From $2.75 to $3.25@$3.50—Lake Market a Stronger Factor—A. F. L. Session Rouses Interest.

STEEL mills and railroads are again active factors in this the biggest market adjacent to the non-union fields. Their buying combined with the attitude assumed by the smaller operators and producing companies in the southeastern and eastern Kentucky fields has brought about a recovery in price that about equals the values set some three weeks ago.

There was a little upward climb after the announcement of the Hoover maximum prices, but that was slight compared with the scurry to get to the dividing point within the past few days. From $2.75 a ton the price on high volatile steadily climbed until it soon reached the level of $3.25@$3.50. The Lake market is in stronger evidence.

HIGH-VOLATILE FIELDS

KANAWHA

There has been a marked increase in the output. About five times as much coal is now being produced as was the case at the outset of the strike, owing to the increase in the number of plants at work. Between the two Washington price conferences there was a slight slackening of production, but during the first few days of June, there was a decided revival in demand and prices began to move upward.

LOGAN AND THACKER

After the conference at Washington had fully developed just what the maximum price was to be, there was a decided increase in inquiries and orders, with prices crawling back near $3.50. As has been the case for the last two months consumers are interested in mine run and slack alone, there being little domestic demand.

Even after the market had softened to some extent, there was no diminution in the output of the Thacker field and during the first three days of June, inquiries and orders were more plentiful than ever. Mines are shipping about 160,000 tons a week in the Williamson field alone, most of this output for Western markets, with a large tonnage destined to Lake.

NORTHEASTERN KENTUCKY

Under the stimulus of heavier buying prices are rising again. Mines are now shipping about 75 per cent of capacity, railroad disability cutting some figure in retarding production. There is still one isolated section where men are on strike, but the field as a whole has not been and is not being affected.

SOUTHEASTERN KENTUCKY

Production continues to increase, with practically every mine running full blast. Creech Coal Co., on Wallins Creek, the last of the big mines that have been idle, has started up on a strictly non-union basis. It is understood that nearly 100 per cent of their regular employees reported for work, and they were swamped with applications from outside miners.

Car supply is not so good as last week. Tracks are badly congested between mines and Cincinnati.

CINCINNATI

The accumulation that was so evident a fortnight ago has entirely disappeared and the old procedure of forcing the buyer to pay is again in effect. Western railways have been seeking coal and some of these have been offering equipment to move tonnage. Lake buyers too are stronger in evidence with a large amount moving east on Lake Erie. With the American Federation of Labor going into session here attention has already been directed through Sam Gompers' discussion of the strike situation and the labor viewpoint on the Coronado Coal decisions in the United States Supreme Court.

Smokeless is trailing high-volatiles, the upward trend in price not being so pronounced as in the straight bituminous sales. Lump is still commanding a premium and where it is slow in forcing sales the make of many mines is turned to a straight mine run basis. Tidewater business has not been near the peak and more smokeless has been turned to Inland business this week.

The retail situation is adjusting itself. Retailers have gone to $8 for Pocahontas lump, after several weeks of some firms underselling by 50c. Mine-run is $6.75 and high-volatile lump is $6.25@$6.75, with the slack $4.50@$5 and a chance of a large increase on these last two in event that the river supply gets lower, it being declared that there is now about three weeks' shipments awaiting to be transferred.

LOW-VOLATILE FIELDS

POCAHONTAS AND TUG RIVER

More cautious buying late in May failed to affect Tug River production, and even a holiday failed to reduce the Pocahontas output. Buying is now on a more active scale than ever. This heavier buying is reflected in a rise in prices.

In Tug River there was an increasing demand in evidence just as soon as all doubt as to what prices were to be were removed. Consumers are paying not far from the maximum of $3.50.

NEW RIVER AND THE GULF

Additions to the list of New River mines in operation are making possible increased production. Approximately half of the mines are now in operation. During the first week of June and after the maximum price had been agreed upon, there was a resumption of buying on a heavier scale and prices stiffened somewhat.

Notwithstanding a slight recession of demand and prices at the time of the price conferences, Winding Gulf mines have continued their heavy production, the rate being about 30,000 tons a day.

Coke

CONNELLSVILLE

The Carnegie Steel Co. is now operating 36 blast furnaces and expects to blow in another, this comparing with 34 stacks in operation April 1. Other iron and steel interests are, on the whole, doing a trifle better in the matter of coke supplies. Production of Connellsville coke gains a trifle from week to week.

There has been a little buying of furnace coke on behalf of Eastern consumers, at around $7, which has been the quotable market lately. A few sales of foundry coke are being made, the regular price being about $7.50.

Demand on the part of furnaces is extremely light, not because furnaces could not operate if they had coke, but because the price that would be asked would not justify operation. The demand from foundries is likewise light, but because the foundries as a whole are not busy, otherwise their stocks would have been exhausted some time ago.

The *Courier* reports production during the week ended June 3 at 34,650 tons by the furnace ovens and 13,820 tons by the merchant ovens, making a total of 48,470 tons, a decrease of 10,660 tons, attributed to the Memorial Day holiday.

UNIONTOWN

Apparently the effort to control the coal market during the strike has not proven effective. Consumers, particularly steel interests are bidding against each other for Connellsville tonnage. Quotations on Saturday ranged $3.50@$4, with sales recorded principally at $3.75@$3.90.

Before Hoover stepped in, the market rose steadily since the strike commenced and at that time was quotable at $3.75@$4.25. Immediately after Hoover announced his price plan the market dropped $1 to a point below what the Commerce Secretary had fixed as a fair price.

Then a group of some twenty operators got together at Uniontown and decided that they would ask Hoover for a price of $4.50 from the Connellsville region, the extra dollar representing the cost of mine guards. Mr. Hoover declined to view the situation in that light and the day following the conference at Washington the Connellsville market again commenced to bound.

BUFFALO

The situation is practically the same as with coal. Even a good movement of manufactured iron and steel does not exhaust the supply and send up prices. Some jobbers report a half dollar or so above the former $7 for 72-hr. Connellsville foundry, some do not. Furnace is $6@$6.50 and stock, $4.50.

News Items From Field and Trade

ALABAMA

The Iron Products Corporation, New York, and its subsidiaries, the Central Foundry Co., Central Iron & Coal Co., Central Radiator Co., and Molby Boiler Co., announce the opening of a district sales office in the Jefferson County Bank Bldg., at Birmingham.

COLORADO

Major Louis D. Blauvelt, at present Colorado state highway engineer, has been appointed chief construction engineer of the Moffat tunnel project by the tunnel commission. He will probably resign as state highway chief at an early date.

For fifteen years Major Blauvelt was connected with the Moffat (Denver & Salt Lake) road as engineer. Under his direct supervision five tunnels have been built on this road.

The tunnel under James Peak will open one of the greatest coal fields in the world in Moffat and Routt counties, and Unitah basin, Utah.

One more large coal mine has been added to the state's revenue producers, located under an entire section of land eighteen miles north of Denver, in the northern coal fields. It is known as the Morrison mine. At an expense of over $180,000, a modern preparation plant has been installed. The capacity is 1,500 tons of coal daily. A three-compartment hoisting shaft has been sunk, working entries driven, disclosing a clean breast of sub-bituminous coal 9 ft. in thickness, upon which the state's lessee is now mining and making an extensive production.

ILLINOIS

Edgar Mordue, formerly associated with the General Fuel Company, announces the organization of the **Edgar Mordue Coal Co.**, with offices in the Old Colony Bldg. The company will deal in domestic, malleable, New River-Pocahontas smokeless, byproduct and steam coals.

The Cherry mine of the St. Paul Coal Co., of Chicago, may not be dismantled and closed down, according to orders received from the main offices of the company. The mine is well known throughout the Middle West on account of a fire which occurred in the workings in 1909 in which 268 lives were lost.

H. T. Sheppard, of Chicago, was in Herrin recently visiting mines in that vicinity. He is secretary-treasurer of the Taylor Coal Co., Chicago.

The Chicago Title & Trust Co., as trustees, by attorney, John W. Preihs, Pana, has instituted suit in the Christian County court to foreclose a trust deed against the **Smith-Lehr Coal Mining Co.**, Pana. The bill recites the defendants issued $125,000 of gold mortgage bonds bearing interest at 5 per cent July 1, 1905 and due in 1925. The trustee alleges that no interest has been paid since 1913 and that there is now due the sum of $188,575.20 to the holders of the bonds and they desire foreclosure for failure to comply with the terms of the trust deed and the bonds.

A reorganization of the **Sharon Coal & Brick Co.** has been effected, the old company to be succeeded by the **Sharon Coal Co.** The new company will have capital of $200,000, and it is expected that it will soon issue bonds for $150,000. A switch will be built from the property, located near Georgetown, Ill., to connect with the Cairo Division of the Big Four. The mine will be electrified and supplied with modern equipment. Robert B. Pettigrew, for some time manager of the Brady Branch mine near Danville, will be in charge of the mine.

The United Coke & Coal Co. announces that offices have been opened in the Fisher Bldg., Chicago, for the sale and distribution of Roberts byproducts and Connellsville industrial, foundry and domestic coke; also Pocahontas and all grades of Illinois, Indiana and Kentucky coal. J. G. Supple, formerly of the Wisconsin Lime & Cement Co., and Lewis D. McClaren, formerly of Rogers, Brown & Co., are actively associated with the company.

The Consolidated Coal Co. is now working about twenty union men at its No. 9 mine, Murphysboro, pumping water and doing some developing work. The mine is the one which was flooded late last November and which for a time came near being abandoned by the owners for that reason.

The Martin-Howe Coal Co., Pike County Coal Co., Tecumseh Coal & Mining Co., and the **Simplex Coal & Mining Co.**, have been consolidated into an organization to be known as the **Howe-Coulter Coal Co.**, with offices in the McCormick Bldg., Chicago.

KENTUCKY

The Harlan Coal Co., a Louisville corporation, is preparing to develop 8,000 acres of coal and timber land in Harlan and Bell counties. About four miles of railroad will be built and a saw-mill erected. A large number of houses are to be built. Ivor Livingston, of Chattanooga, chief engineer for the company, is now on the ground directing the work.

The Boone Trail Coal Co., Pineville, is the latest addition to the membership of the Kentucky-Tennessee Coal Operators' Association.

The Standard Elkhorn Coal Co., Louisville, has filed amended articles increasing its capital from $200,000 to $300,000.

MINNESOTA

E. N. Saunders, Jr., president of the Northwestern Fuel Co., was at Duluth recently looking over the market situation.

Colonel John H. Sessions, who at the age of 73 years retires as Northwest agent of the Philadelphia & Reading Coal & Iron Co., after 28 years' service, was presented with a loving cup by Duluth-Superior coal dock operators recently. The presentation was made at a banquet at the Kitchi Gammi club at Duluth. E. T. McDonald will succeed Mr. Sessions. Both Mr. Sessions and Mr. McDonald are of St. Paul.

The City of Waseca is within its legal rights in levying a tax for the maintenance of a municipal coal and woodyard, according to a decision by the State Supreme Court. A local lumber and coal concern attempted to prevent the city from conducting a coal business, but the court rules against the move.

MISSOURI

The Pittsburgh Testing Laboratory announces the opening of a sales office with an inspection bureau in the Railway Exchange Bldg., St. Louis, and the appointment of Colonel N. C. Hoyles as district manager.

NEW YORK

A visitor in New York early in the month was **C. L. Green**, director of the employment relations department of the Consolidation Coal Co., with headquarters at Fairmont.

Much interest attaches in West Virginia to the determination of the **Diamond Fuel Co.** case in the United States Circuit Court of Appeals of the Second Circuit in the City of New York. It was in February, 1921, that several coal companies of West Virginia filed a petition in involuntary bankruptcy proceedings in the United States District Court for the Southern district of New York against the company. The company had been engaged in operating mines in Barbour County, W. Va., and in purchasing coal and exporting it. As far back as October, 1920, suits in admiralty in the United States District Court in Baltimore had been instituted by the Kanute Steamship Co. and other steamship concerns for alleged breach of contract, alleging that vessels had been chartered to carry coal to Europe. After a large tonnage of coal in Baltimore had been attached, it was sold, about $100,000 being realized, this being held by a trustee in the United States District Court for the district of Maryland pending the outcome of legal proceedings.

When in February, 1921, the creditors of the company filed the involuntary petition in bankruptcy it was claimed that deeds to certain preferred creditors were a preference within the meaning of the bankruptcy act. A decision was rendered favorable to the contention of the plaintiff companies. Upon an appeal the decision of the lower court was upheld. Claims amounting to approximately $1,000,000 have been filed with John J. Townsend, referee in bankruptcy, these claims being those of coal companies, merchants, banks and others in the state of West Virginia.

A. D. Halporn, who has been associated with the Philadelphia sales staff of the Combustion Engineering Corporation, has now become a member of the New York sales force.

OHIO

The Boggess Coal Co., Columbus, is the name of a new retail concern which operates a yard at White and McAllister avenues. R. B. Boggess is president and general manager, and all varieties of coal are handled. Steps are being taken to put in loading and unloading machinery.

The Harruff, Patton & Harruff Coal Co. has been chartered at Marion with a capital of $100,000 to mine and sell coal. The incorporators are J. B. Patton, Frank J. Harruff, S. H. DeLong, Perry L. Harruff and Samuel L. Prollinger.

PENNSYLVANIA

The Navy Smokeless Coal Co., one of the largest coal mining companies in central Pennsylvania, has sold its holdings, mine equipment, machinery, etc., for a consideration said to be $850,000. The company owned 3,200 acres of Miller seam coal lands at Carrolltown Roads, Cambria County, where the company's opening, known as the Valley Smokeless Coal Mine No. 1, is located. The Navy Smokeless company is composed of the following: Walter Jones, I. E. Lewis, H. Frank Dorr, H. J. Van Dusen, T. Stanton Davis, Fred Custer, William Krug, Dr. H. H. Bennett and Ambrose Shettig. It is understood that the purchaser is a newly formed company, in which T. Stanton Davis and Walter Jones are interested. Charles D. Amos of Philadelphia, who is connected with the International Coal Corporation, is also interested. The new company will start operations as soon as the strike is settled.

The Emmons Coal Mining Co., Philadelphia, has bought out the **Inland Coal Co.'s** Greenwich No. 2 and No. 3 mines, located at Saxman, Cambria County. A. R. Llewellyn, formerly mining engineer of the Emmons company, has been appointed superintendent of this operation, which is now called the **Marion Center Coal Mining Co.**

A State charter has been issued to the **Perry Hills Coal Co.**, Punxsutawney, with a capital stock of $150,000. Ned L. Brown, Punxsutawney, is treasurer of the company and its incorporators are P. L. Brown, Leon H. Hoffman and M. E. Hoffman, all of Punxsutawney.

The Maryland Coal Co., with operations at St. Michael, Cambria County, is making preparations for extensive improvements. An addition to the powerhouse will be erected and the tipple and all company buildings will be given a general overhauling.

A balanced Marcus screen is to be installed for the **South Fork Coal Mining Co.** in its retarding conveyor tipple at South Fork.

The M. A. Hanna Co. has purchased two cylinder Hardinge Conical Ball Mills to complete their anthracite grinding installation at the Lytle Coal Co. collieries, Minersville. These two mills were installed as a result of the successful operation of the first unit, which is now grinding anthracite culm for burning under boilers.

A State charter has been issued to the **Montour Coal Co.** of Pittsburgh, with a capital of $15,000 and J. E. Kerin, Moon Run, treasurer. The incorporators are: N. P. Sasso, Crafton; J. E. Kerin, and Frank Aubel, Moon Run.

The tipple at the mines of the **Quemahoning Coal Co.**, at Wells Creek, Somerset County, was recently burned. The loss will reach $20,000. At the same time the fanhouse was wrecked with a charge of dynamite. The mines of the Quemahoning company are operating and strikers are blamed for the fire and explosion.

An involuntary petition in bankruptcy has been filed against the **Fidelity Coal & Coke Co.**, Pittsburgh, and a receiver has been appointed.

As soon as the anthracite suspension ends, the **J. S. Wentz Co.**, of Hazleton, controlling five collieries, will push a number of improvement projects. The big stripping job at Hazlebrook will be rushed. At Raven Run a new breaker will be erected and a large number of cottages will be put up for employees. The former McTurk colliery, at Girardville, will be electrified.

A state charter has been issued at Harrisburg to the **Arthur Coal Mining Co.**, of Blairsville, the purpose of which is mining of coal and the manufacture of coke. The capital stock is $10,000 and the treasurer is R. M. Wilson, Blairsville. The incorporators are D. E. Brown, Punxsutawney; Joseph Dellaflora, Blairsville and J. M. Stetts, Punxsutawney.

The office of vice-president of **W. J. Rainey, Inc.**, made vacant by the resignation of **L. L. Willard** will not be filled, according to information given out at the offices of the coke company in Uniontown. **John Slarock**, general superintendent for the company, will assume the work heretofore devolving on the vice-president.

The output in the central Pennsylvania field for May was 12,622 cars, as against 11,915 cars in April. Under normal conditions, the district should have produced 80,000 cars in each of these two months.

The Central Pennsylvania Coal Producers' Association named **H. J. Meehan**, of the Cosgrove company, Johnstown, **R. Dawson Coleman**, of the Ebensburg Coal Co., Ebensburg, and **Charles O'Neil**, secretary of the association, as a temporary committee to represent Herbert Hoover in carrying out the program to prevent speculation in coal.

E. N. Eddy, secretary and treasurer of the E. L. & W. Coal Co., with headquarters at Fairmont, was a visitor in Uniontown, Pa., early in the month.

B. M. Chaplin, vice-president of the Monongahela Coal Association, was a recent visitor in Pittsburg.

It will probably be several months before the **Hudson Coal Co.** can reclaim its mines or estimate its damages wrought by the recent flood at Carbondale. Nos. 1 and 3 Powderly mines are completely filled with water. The work of changing the course of the water into the Fallbrook Creek from the openings in the mines on North Scott St. has been completed, but it was not until hundreds of men working day and night were pressed into service and a tremendous amount of money expended.

Fire completely destroyed the breaker of the **East Point Coal Co.**, at Pond Creek, north of Hazleton. The fire is a mystery, as fires had been drawn there last February, owing to the glutted condition of the coal market, the miners' suspension now under way preventing a resumption later on. The loss is fixed at $50,000. The company is controlled by a group of Scranton capitalists.

TENNESSEE

The Vasper mine, owned by the La Follette Coal & Iron Co., Vasper, has started operations after having been closed down for six weeks. About 75 men resumed work. Of these about 45 or 50 were formerly employed. Officials announced that former employees were occupying company houses. These men would have to resume their place in the mine or vacate the houses. There has been an influx of men at Vasper and the houses were needed for the newcomers unless the former employees went to work.

The Durham Coal & Iron Co. has announced that the mines at Graysville, which have been idle for the past year, would be placed in operation at once in order to meet demands from Northern and Eastern points. It was at the same time announced that another mine at Snoddy would be reopened as soon as sufficient miners could be employed.

UTAH

The Carbon County officials have withdrawn the special deputies from the coal camps, owing to inability to finance them any longer. Efforts to get the state to take up the work of the guards have failed. The foreigners have ignored the order to turn in their arms and no warrants have been issued for the arrest of any of them so far. Conditions are quiet, but it is feared that a clash may come at any moment as a result of agitation by the radicals.

Base rates for workmen's compensation insurance paid by Utah operators have been reduced from $4.30 to $3.90. The change was advised by Commissioner O. F. McShane, who said his investigation showed conclusively that the old rates were much too high.

A petition of three former employees of the **Blue Seal Coal Co.**, of Scofield, requests that the company be declared bankrupt. They claim their wages have not been paid.

D. W. Rawson, of Ogden, doing business as the **Rawson Coal Co.**, has filed a petition in bankruptcy. Liabilities are $16,585.23 and assets $8,862.43, of which $2,700 is claimed to be exempt.

The Rock Ledge Coal Co., of Salt Lake City, has been granted permission by the Securities Commission to sell $60,000 worth of first mortgage 8 per cent 20-year bonds.

VIRGINIA

V. Diehmann, manager of the Norfolk offices of Harris, Magill & Co., for a number of years, has gone to New York to assume active charge of the headquarters of the company. He is succeeded here by **Saunders Wright**, formerly manager for Callaghan-Atkinson Co., which went out of business.

An effort is being made to reorganize the **Sewalls Point Coal Exchange**, which ceased to function a month ago, on a demurrage basis. It is proposed to have dealers continue to ship through the exchange to their various classifications, thereby getting the benefit of their debits and credits, which is not the case at Sewalls Point now. S. T. Snead, manager of the exchange, is winding up its affairs.

WASHINGTON

A large party of Czecho-Slovaks from the Lehigh field in Pennsylvania have left for Seattle, where they have secured work. More will depart soon, entire families being booked to go. The men were miners employed at the anthracite collieries, and have been idle since the suspension began.

The results of the semi-annual election of mine councilmen at the mines of the **Pacific Coast Coal Co.** have been received, and show an encouraging percentage of votes cast in the various zones. With the new men in office, all the representatives of the men in the mines councils are elected men, half holding over until Dec. 1 next, and the other half—those just chosen in the elections—remaining until June 1, 1923. Those recently elected are to serve one year.

WEST VIRGINIA

Suit has been instituted in the Circuit Court of Kanawha County, against the **Dana Coal Co.**, the plaintiff being Charles C. Dickinson, of Charleston, who seeks damages to the extent of $68,000, claiming that the defendant company has mined across his boundary line without permission. The law prescribes a fine of $500 for every offense of this nature but the plaintiff is seeking to secure reimbursement for the value of the coal it is alleged the defendant has mined with his boundaries.

Suit has been brought in the Circuit Court of Fayette County by the **Maryland Coal Mining Co.**, against the **Atlantic Coal & Iron Co.**, operating mines at Bachman and at Cataract. It is alleged that the defendants purchased the property in January, 1921, at a price of $350,000 and it is further alleged that there is $124,312 unpaid on the purchase price and that defendants are dismantling the mines and preparing to abandon operations. Four cars of material have been shipped, it is alleged, and further shipments have been stopped by levy on personal property.

Clarksburg business men have organized the **Will-Earl Coal Co.**, which will engage in the coal business on a small scale, having a stock of $10,000. Headquarters of the new concern are to be in Clarksburg. Conspicuous in connection with the new company are: E. O. Horner, E. L. Rogers, E. T. Rogers and E. A. Barlett, all of Clarksburg.

Morgantown business men have launched the **Poland Co-operative Coal Co.**, which will operate in the Monongalia field. This company has a capital stock of $10,000. Offices are to be at Morgantown. Leading spirits in the new company are George Poland, William Kearns, Louis Kennell, P. P. Sharon and V. M. Conner of Morgantown, W. Va.

Fire, believed by company officials to have been of incendiary origin recently destroyed the drum-house of the Opekiska mine of the **Superior Connellsville Coke Co.**, at Opekiska, making it necessary to suspend operations. It will be necessary to install a new hauling system. The drum-house destroyed was on a hill about 700 ft. above the tipple. This company lowers its coal from the mine mouth through an incline system.

The Triangle Coal Co., is a new concern which will operate on a small scale in the Pocahontas region, this company being capitalized at $325,000. Offices of the company are to be established at Bluefield. Active in effecting the preliminary organization of the company were: T. N. Daugherty, of Pinson Fork, Ky.; William B. Crawford, J. L. Ellis, John Roberts and M. M. Crawford, of Bluefield, W. Va.

Tracts aggregating 8,000 acres of land underlaid with coal across the river from Hinton in the angle formed by the junction of Glade Creek with New River, have been purchased from various owners by the Eastern Coal & Mining Co., a Baltimore corporation, which plans development on a large scale. The purchase price aggregates $600,000. A railroad is now being built up Glade Creek to serve the mines to be opened on the property.

Lloyd Bailey has resigned his position with the Crescent Fuel Co., to accept a position with the Wentz Company, in Clarksburg.

Captain B. R. Smith, of Huntington, one of the well-known operators of southern West Virginia, has gone to Maine to spend several weeks fishing. He spent a day or so on his way to New England at Washington attending the conference between Secretary Hoover and coal operators.

A large tract of coal and timber land in Wyoming County has been acquired by **Charles W. H. Crane**, of Cincinnati, **A. J. Dalton** and **John A. Kelly**, of Huntington, from the Cole & Crane Real Estate Trust. This property consists of about 52,000 acres on the Guyandotte River and its tributaries, extending on both sides of the river from Pineville, the county seat, to the Logan County line.

President E. E. White, of the E. E. White Coal Co., was a visitor in the capital about the first of June.

BRITISH COLUMBIA

The provincial Department of Mines reports a very large increase in coal output in the provincial fields of Crow's Nest, Nicola, Princeton and Vancouver Island. Last year for the first quarter the output was 637,333 tons. This year it is 750,355. There was an increase in every field, but the Crow's Nest showed the largest with 52,833.

OUTPUT FOR FIRST QUARTER OF 1922.

Mine.	Tons. 1922	Tons. 1921
VANCOUVER ISLAND DISTRICT		
Canadian Western Fuel Co.	179,386	150,896
Canadian Collieries (D) Ltd.,		
Comox	81,022	113,177
Extension	57,645	47,471
South Wellington	22,859	21,502
Granby Cons. M. S. & P. Co.	76,940	57,035
Nanoose Wellington Collieries	25,851	15,104
Old Wellington	1,602	496
Total	445,305	405,681
NICOLA-PRINCETON DISTRICT		
Middlesboro Collieries	18,249	20,795
Fleming Coal Co.	9,439	8,667
Coalmont Collieries	31,766	13,609
Princeton Coal & Land Co.	5,988	1,806
Total	65,442	44,877
CROW'S NEST PASS DISTRICT		
Crow's Nest Pass Coal Co.,		
Coal Creek	133,623	95,394
Michel	88,011	72,276
Corbin Coal & Coke Co.	17,974	19,105
Total	239,608	186,775

ONTARIO

The trial of Hiram F. Slater and Leslie J. Thompson, his son-in-law, promoters of the insolvent **Nukol Fuel Co., Ltd.**, opened in Toronto on June 7. Both men are charged with conspiracy to defraud the company and the public and to affect the market price of the stock of the company. The second and third counts embody the stealing and receiving of $400,000 belonging to the company. There are ten additional counts against Slater for forgery. There are between seventy and eighty witnesses and the case will likely last about two weeks.

E. W. Hartland, manager of the Pittsburg office of the Fish Coal Co., Toronto, spent a few days in Toronto on his way back after attending the convention of the American Wholesale Coal Dealers' Association, in Detroit.

NEW BRUNSWICK

The Consumers' Coal Co., of St. John, has opened new offices. Heretofore this company has had its office at the coal yards. The company is one of the largest retail and wholesale coal firms in eastern Canada, although organised only eight years ago.

WASHINGTON, D. C.

The Supreme Court, on motion of Daniel Davenport, attorney for the coal company, has postponed for 30 days the taking effect of its mandate in the **Coronado Coal Co.** case, in order to permit application to be filed for rehearing.

The government will oppose further delay in enforcing compliance with the **dissolution decree in the Reading coal case.** Solicitor General Beck has announced for the Department of Justice that if the court is requested by counsel for the coal interests to withhold issuing the mandate, pending filing of a petition for rehearing of the case, that the government will oppose granting the motion. He contends that the appeals in this case have already been argued twice before the court and that to withhold the issuance of the mandate pending petition for rehearing will further delay carrying out the dissolution order until next fall.

Because of its interest in the accounts of the **Tidewater Coal Exchange** which since the war has become bankrupt, and whose affairs have been the subject of court litigation, the Railroad Administration has requested the Supreme Court to review the decision of the lower court involving credits and debits of the exchange. The motion has been supported by the Solicitor General, acting on behalf of the government for the Department of Justice. The government's brief in the case points out that the Railroad Administration has claims of $971,000 against the exchange, of which $750,000 is for demurrage.

The Rocky Mountain Fuel Co., has requested the Supreme Court to review and set aside the decision of the Circuit Court of Appeals for the Eighth Circuit in a damage suit alleging breach of contract brought against it by the **Consolidated Coal & Coke Co.** The Consolidated company obtained damages of $42,057 in the lower court from the Rocky Mountain, alleging that the Rocky Mountain company had failed to live up to a contract entered into in 1914 for the sale of 125,000 tons of coal a year for five years as mined by the Consolidated company. Deliveries were made by the Consolidated to the Rocky Mountain for slightly over a year, but as the Rocky Mountain company failed to take the stipulated monthly tonnages, it was notified in December, 1915, that it considered that the Rocky Mountain had breached the contract. The Rocky Mountain company contended that it had lived up to the contract and ordered all coal from the Consolidated company for which it could find a market.

J. D. Northrop is in New Mexico making a special examination on the east side of the San Juan Basin in connection with coal leasing work.

Suit has been filed in the District of Columbia Supreme Court by L. N. Rosenbaum & Co., of New York, to recover $528,300 from William V. and Eldridge R. Boyle and James C. Robertson in connection with the formation of a corporation known as the **Empire Kentucky Coal Co.** The plaintiff states that after it sold 99,000 shares of stock the defendants refused to proceed with the incorporation of the company.

The Supreme Court has declined applications which had been made requesting it to review the complaint of the **Rocky Mountain Fuel Co. vs. the Consolidated Coal & Coke Co.**, involving coal contracts, and the case of the **Akansas Anthracite Coal Land Co. vs. Stokes**, regarding mine management.

Coal Resources of the Monongahela River region were referred to in a recent speech in the house by Representative Kelly, Pennsylvania. He said that in 1920 the coal shipments over the river amounted to twenty-four million tons. He said that upstream improvements to the river are essential as the coal in the lower reaches is practically exhausted. He said railroad transportation will not meet the situation because of the physical character of the land, and the steel industries cannot provide space necessary for incoming cars, for switching and for empty cars. In five miles from the river in Pools 7 and 8 there are hundreds of millions of tons of coal in the Sewickley vein alone, which can be handled to the Pittsburgh district by water at a saving of 50c. a ton.

The Supreme Court has declined to review the decision of the lower court in the case of the **Spring Coal Co.**, vs. the **Bethlehem Steel Co.** The coal company contended that it was entitled to a higher price for coal furnished the Bethlehem Company under government prices during the war because coal it sold to the steel company was exported, and the fuel administration allowed higher prices for exported coal over that for domestic use. The court also declined to review the decision of the lower court in the case of the **Delaware Steamship & Commerce Corporation vs. the New England Coal & Coke Co.**

Traffic News

The Perry Coal Co., of St. Louis, in a complaint to the I. C. C. alleges unreasonable rates on coal from its mines in Illinois to various interstate points.

The Illinois Coal Traffic Bureau has been authorized to intervene in the complaint of the **Perry Coal Co.**, which involves rates on coal from mines in Illinois to interstate destinations.

The hearing scheduled by the I. C. C. at Denver, June 22, in the complaint of the **Colony Coal Co.**, has been postponed to a date to be later announced.

At Washington on July 12, the commission will hear oral arguments in the complaint of the **Little Fork Coal Co.**; July 14, the complaint of the **Clay County Coal Operators' Association**; July 19, the **Detroit Coal Co.**

The railroads having suspended the schedules, the I. C. C. has vacated its proceedings in the matter of rates on coal from Virginia mines to points in South Carolina.

In a complaint to the I. C. C., **Gottlieb Bertsch**, of Kendallville, Ind., alleges unreasonable rates on coal from producing points in Indiana to Kendallville.

Effective June 15, freight rates on domestic coal from Utah to all main line points in California on the Western Pacific R.R. will be reduced $1.25 a ton. There will also be a reduction on bunker coal of 85c. a ton. To points not on the main line of the California roads and where the rate is more than $7.25 per ton, the reduction on domestic lump will be $1.25 a ton also. These reductions are subject to the confirmation of the I. C. C.

In the complaint of the **McKell Coal & Coke Co.**, an I. C. C. examiner recommends that the rates on coal from mines on the Kanawha, Glen Jean & Eastern R. R. to points on the C. & O., and connections are unreasonable.

In the complaint of the **Oliphant-Johnson Coal Co.**, the I. C. C. decides that the rates on bituminous coal from Seifert and Turner, Ind., to Sandusky, Ohio, is unreasonable. The railroads are directed to establish rates before Aug. 26, which do not exceed the rate from the Linton-Sullivan district.

The report of the **Virginian Railway** for the year ended Dec. 31, 1921, shows a net income amounting to $2,937,732 after all taxes and other fixed charges. This is equivalent to $4.92 a share earned on the $31,271,500 outstanding common stock after allowing for 5 per cent on the cumulative preferred stock. Taking into consideration $2,308,000 received in 1921 for rent of property during the Federal Control period, the report indicates a total net income of $6,245,827, equivalent to $12.30 a share earned on the common stock. Back dividends on the preferred stock totaled 35½ per cent up to Feb. 1, 1922.

The case before the I. C. C., involving rates on coal from Kentucky, Tennessee and Virginia, to Northern and Northwestern points, has been assigned for hearing before an examiner at Minneapolis, July 3.

The complaint of the **Wasatch Fuel Co.**, and the **Jeremy Fuel & Grain Co.**, have been assigned for hearing at Salt Lake City, July 6.

Reports from the L. & N. show that a large percentage of the coal being mined in Kentucky and other Southern states is being routed over its lines. Two hundred coal cars are turned over to the L. & N. every day at Mt. Vernon, Ill., by the Big Four, which is said to have 5,000 empty cars on track. Fourteen extra engines were recently put on the Evansville division of the L. & N., and fourteen more are being ordered immediately.

Association Activities

Retail Coal Dealers' Association of Texas

The Seventeenth Annual Convention of the association was held in Greenville, Tex., May 15 and 16. After hearing several addresses on the first day, the visiting coal men gathered for a banquet at the Chamber of Commerce Hall. On the second day various objectives of the association were outlined for the coming year, among them the endeavor to secure lowered and seasonal freights and to combat any move for government control of the coal industry. New officers are Lee M. Pool, of Greenville, president; H. S. Trewitt, Dallas, vice-president; N. N. Martin, of Vernon, second vice-president, and C. R. Goldman, of Dallas, secretary-treasurer. Additional members of the Executive Committee are Messrs. Lacy, of Waco; Bibb, of Ft. Worth, and Bailey, of Paris.

Monongahela Coal Operators' Association

That plans may be on foot to start up the mines in the Morgantown District of West Virginia was indicated at a meeting of the association held in Pittsburgh on June 2. The members of the association, first of all met the officials of the Pittsburgh & Lake Erie, the Pennsylvania and the Monongahela R. R. in conference, the announced purpose of the conference being to discuss traffic condition along the Monongahela and elsewhere. Stress is laid on the fact that the operators and miners in the Morgantown field have no controversy and that the sole reason for a strike was because the miners belong to the United Mine Workers. N. M. Chaplin, of Morgantown, vice-president of the association, presided. Mr. Chaplin, speaking for the association, stated that through the Morgantown region miners were displaying a willingness to work. Another subject discussed was the reduction in freight rates and the effect of such a reduction on mine operators and carriers. As an outcome of the conference with railroad officials, preliminary arrangements were made for immediate and adequate facilities for transporting such coal as might be produced in the event that resumption of operations might become necessary.

Coming Meetings

National Safety Council. Eleventh annual Safety Congress at Detroit, Mich., Aug. 28 to Sept. 1. Executive secretary, W. H. Cameron, North Michigan Ave, Chicago, Ill.

Coal Mining Institute of America will meet Dec. 13, 14 and 15 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 911 Chamber of Commerce Bldg., Pittsburgh, Pa.

Colorado and New Mexico Coal Operators' Association. Annual meeting June 21 at Denver, Col. Secretary, F. O. Sandstrom, Boston Building, Denver, Col.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

American Institute of Chemical Engineers will hold its summer meeting at Niagara Falls, Can., June 19-22, with headquarters at the Clifton Hotel. Secretary, Dr. J. C. Olsen, Polytechnic Institute, Brooklyn, N. Y.

Mine Inspectors' Institute of the United States of America will hold its annual meeting July 11, 12 and 13 at Chicago, Ill. Secretary, J. W. Paul, 4800 Forbes St., Pittsburgh, Pa. Announcement regarding headquarters will be made later.

Coal and Industrial Exposition under the auspices of the Huntington Chamber of Commerce will be held Sept. 18-23 in the Chamber of Commerce Bldg., Huntington, W. Va. **The West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers** will again hold its annual meeting in the same building during the exposition.

National Exposition of Chemical Industries will hold its eighth national exposition at the Grand Central Palace, New York City, Sept. 11-16. Manager, Charles F. Roth, Grand Central Palace, New York City.

COAL AGE

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What the Anthracite Miner Wants

MATTERS at issue between the operators and miners in the anthracite region are now quite clearly defined. Arbitration of the score of demands of the miners with respect to wages and working conditions has been urged by the operators and as flatly refused by the miners.

What the miners are now demanding as a condition to returning to work is that the operators enter with them into an illegal conspiracy. They say almost in so many words:

Anthracite enjoys the position of a natural monopoly. The public must have it and will have to pay whatever price we put on it. Give us, the miners, complete union recognition—which being interpreted, is the check-off—and thus complete our monopoly in labor. Adjust our wages up and not down. The four factors which you, the operators, set forth in your memorandum of May 10 as properly controlling wages—namely, purchasing power of the dollar, opportunity for employment, wages in comparable industries and for comparable lines of endeavor, and the general economic condition, are not acceptable to us, the miners. If we were to concede these things it would be to admit that our labor is as other labor in the United States, entitled to wages and earning compatible with its worth and in line with what the industry and the public can afford to pay for it. On the contrary, we are anxious to be real coal barons. Please do not stand in our way when we are trying to set up anthracite mine labor as a highly preferred class. Join with us in this brazen and unholy alliance and we will join with you in lowering the price of coal to the consumer by taking $5 off the freight rate (already less than $5) and in attacking the profits of middlemen and retailers.

Repudiation by the operators of this proposal has, of course, been prompt and emphatic. To participate in such a conspiracy would bring down the wrath of the public quicker than any other method of attack on its pocketbook. The miners must realize that they have no case, hence their refusal to submit it to fair arbitration. We opposed such a step when proposed by others in March and April, because we believed then and believe now that arbitration is the last resort. The time has come when, collective bargaining having failed, the third party should be brought in.

Not Only in England But Here Also

AN ENGLISH author, Hilaire Belloc, has written a book, "The Mercy of Allah," which tells of a millionaire merchant, Mahmoud, whom he represents as living in Bagdad in the days of Abd-er-Rahman. He is recorded in the story as a traveler through many countries, and in one of these was a law "compelling all men under pain of torture to reveal their revenues from farming or any other reputable trade, but taking no account of gambling or juggling, as being unimportant and too difficult to follow."

In the United States, to cite a single instance out of many, the General Motors Corporation stock went in recent years to 860. Ten shares of a newly issued common stock were exchanged for a single certificate. Not a word was said in Congress, not a state Legislature protested; even Untermyer was silent. It was not as it were "a reputable trade"; it was regarded, as "gambling or juggling, as being unimportant and too difficult to follow." Had it been coal mining, railroading or the public utilities, the Congress, the Legislature, Untermyer and the like would have called loudly for investigation. Mahmoud is right. We have here a natural but a most vicious discrimination against the useful in favor of the valueless or less valuable.

The Vanity of Information

HAIL a stranger for a match or other small favor and he may be disgruntled. But ask his opinion on some matter, large or small, and he swells with pride and gives fully of his time. This is what Carl Snyder, of the Federal Reserve Bank, in a talk to a group of statisticians and economists called the vanity of information. He was discoursing on the plethora of statistical prophecy now being handed out to the business executive, most of which is pure "bunk," and, as someone on that occasion remarked, a great deal of which is free and even forced on a skeptical public.

The air is full of rumors of an impending settlement of the strike in the soft-coal fields and of early action from Washington with respect to the hard-coal strike. These reports are free; they are given freely back and forth in the trade; they constitue the coal man's talk.

Tips—real inside dope—go like this: A side-liner informed us that the brother of a friend of his had just returned from the coal fields, where he had talked—no, not to the operators but the miners—and was informed they had decided not to return to work until November. Another chap, bursting with dope on the "situation" has already had the operators and miners' officials in secret conclave, and would have the mines in full blast before the end of June.

Prophecy is rife about the date of strike termination, the extent of car shortage that will or will not follow and how good or how poor the market will be when winter comes. But if you look and listen carefully, you will not get any of this stuff from those who are on the "know". The best of them are able only to guess, and are not vain with their information.

Where will it end? A few pages of speculation would be easy to write and profitless to read. We may at times resort to "sibylline" statistics (as Joe Pogue calls them), but guessing a date for the meeting of an irresistible body with an immovable one is too much for us.

The Life of Coal Reserves

COAL land under development, land held for future development and just plain land underlaid with coal are three separate forms of reserves. In a recent report on investment and profit in the bituminous-coal industry the Federal Trade Commission devotes some space to a discussion of excess reserves of coal-bearing land held by producing companies. It is pointed out that of 1,126 reports examined in this regard, there were noted 7 indicating reserves sufficient for an average of 108 years at their rates of production in 1918. After allowing each company tonnage for development and for 30 years' production at that rate, it was found for the 7 companies that the range of life over the 30 years was from 6 to 226 years. The investment value of the average holdings in excess of the assumed proper 30 years was in the aggregate $22,000,000. The commission notes: "In the case of these companies, therefore, there is not only a considerable addition to cost resulting from taxes payable on these excess reserves, but if they were to earn a return at the rate of 6 per cent on this $22,000,000 there would be added to the price of their present output of coal, $1,320,000, or about 20c. per ton attributable to such excess reserves."

The commission warns that these 7 companies are not to be taken as typical, but rather as exceptional, and says: "A large majority of the bituminous coal-mining companies undoubtedly have no excess reserves." It thinks, however, that were proper allowance made for holdings in excess of those necessary for 30 years' operation, the limit it presumably sets, the average investment per ton of output reported, $3.12, would be reduced to at least $2.80.

Census schedules for 1919 contained inquiries as to the number of acres of coal land "operated," "controlled," "owned" and "leased." With respect to the information received from the companies the Census has this to say:

> The inquiry on land tenure was confined to land pertaining to the mining operations covered by the report. In many of these, however, land held in reserve for future development and for speculative or other purposes not pertaining to mining was included in the returns, and also a large number of more or less unsatisfactory estimates were included. Nevertheless, it is believed that the data presented reflect fairly the conditions as to land tenure in the mining industries, and correctly show the order of magnitude of land holdings pertaining to mining enterprises.

The Census thus reports the number of coal mines in each state, the total production and the acreage. Data published by the Geological Survey in the coal report for 1917 give the thickness of coal mined, from which may be calculated the weighted averages for the states. Assume a figure for average recovery—say 1,000 net tons per acre-foot—and we have the essential factors for arriving at average reserves in terms of years of life of the average mine.

For instance, 260 mines in Alabama produced 15,411,000 tons of coal in 1919. There were 653,793 acres of coal land "operated" in connection with these mines. The average production per mine was 59,000 tons, the average acreage, 2,500. The average thickness of coal mined in that state is 4.7 ft. (1917), and at 1,000 tons recovery per acre-foot the exhaustion of each acre represented 4,700 tons of reserve. The average mine, therefore, exhausted 12.5 acres of coal land per year at the 1919 rate of production, and the average of 2,500 acres will provide coal for these mines for 200 years. Calculated for the three years ended with 1920, which represented a higher rate of depletion, the average years of life were 177.

In the following table these calculations are shown for the Appalachian region (including all of Kentucky):

	Acres Operated per Mine	Annual Tonnage per Mine	Average Thickness of Coal Mined (Feet)	Acres Mined Out per Year, 1919	Average Life of Reserves in Years	
					1919 Rate	1918-1920 Rate
Pennsylvania	577	58,000	5.6	10.3	56	50
Ohio	491	39,100	5.2	7.5	65	58
Maryland	580	31,800	6.0	5.3	110	97
West Virginia	1,410	60,000	5.7	10.5	134	119
Virginia	3,380	79,000	5.8	13.6	248	220
Kentucky	985	39,400	5.0	7.8	126	112
Tennessee	2,050	36,000	3.9	9.2	223	197
Alabama	2,500	59,000	4.7	12.5	200	177
Appalachian Region	960	53,000	5.5	9.6	100	88

The first thing that strikes one in this tabulation is the high average—88 years—for the Appalachian region, as compared with what might have been expected from the report of the Federal Trade Commission. In detail these figures show a variation in reserve tonnage per mine from 50 years in Pennsylvania to 220 years in Virginia. In fact Virginia tops the list in average tonnage output per mine, in thickness of coal (save Maryland, a small producer), in yearly exhaustion per mine per year and in reserves per mine.

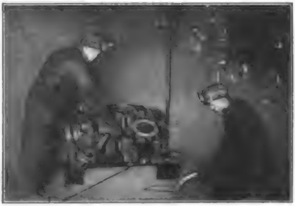
The three Northern states—Pennsylvania, Ohio and Maryland—have the lowest average reserves, and the Southern states the highest. In explanation of this it may be said that in Virginia, Kentucky, Alabama and Tennessee a larger proportion of the acreage and of the annual output is in a few hands than in the other states. Ownership in eastern Kentucky, Alabama and Virginia is particularly concentrated.

Averages are at best uncertain signposts, and particularly so in this instance because there are included two dissimilar things, commercial and non-commercial mines. The average reserves indicated, whether correct or not, are inflated by the very large land holdings of mining companies owned by various steel interests, railroads and certain other owner-consumer mine operators. The cost of carrying reserves borne by steel companies, byproduct coke interests and railroads have no bearing on the going cost of coal on the commercial market. And for many of the larger land-holding commercial coal producers the original cost was so low that the market in times of lack of demand can be and is set at a point that forces those less fortunate companies with higher interest charges to forego that item of cost if they are to share in the going business. Here again competition works in favor of the consumer and discounts the cost of excess reserves. Another factor certain to reduce these estimates is that the thickest coals are now being worked and in the future acreage will be exhausted more rapidly with the same output.

In its report the Trade Commission says that land under development and land held for future use should be carried separately. This may be desirable from the standpoint of the student, but it would have no effect on the cost of coal. Someone at some time must pay the capital carrying charge on these lands, once they have passed from the "farmer" status of simply land underlaid with coal to "coal land" recognized and taxed by the commonwealth. If that cost does not appear on the books of the producing company today, it must assuredly appear there later, else the holder will lose his investment. The cost of carrying excess acreage is real and cannot be postponed indefinitely.

Relation Connected Loads Should Bear to Generator Capacity*

By Carl Lee†
Chicago, Ill.



Courtesy the Goodman Mfg. Co.

Fans Have Low Demand Factor and High Power Factor—Pumps Even in Illinois Have Low Demand Rate—Locomotives on a Run May Use Less Than Forty Per Cent of Their Full Duty

DETERMINATIONS as to the size of a power plant, the capacity of its generators, the size of the cables leading to the mine bottom and to the various sections of a mine are often made without due consideration of the relation between the connected load and the power that will be required under working conditions. The two principal terms used in calculations of the foregoing are load factor and demand factor. In order that the two may not be confused the definitions of each may be given with advantage:

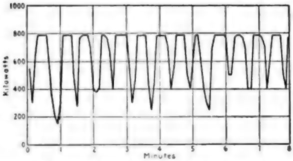


FIG 1. TYPICAL LOAD CURVE ON 950-HP. MOTOR OF FLYWHEEL SET OF 1,300-HP. HOIST

For the motor the demand factor is momentarily 112 per cent and for a 5-minute period 84 per cent. The output of the hoist could be increased by decreasing the caging time or increasing the speed of the hoist or both.

Demand Factor: The ratio of the maximum demand of any system or part of a system to the total connected load of the system or of the part of the system under consideration.

Load Factor: The ratio of the average power to the maximum power during a certain period of time.

The two are closely related and if the load factor of each separate motor is known it is much easier to estimate the demand factor for a large group of motors.

The principal applications of electric power to bituminous coal mines are as follows: (1) Mine ventilating fans, (2) electric hoists, (3) crushers and washers, (4) shop and tipple machinery, (5) pumps and booster fans, (6) mining machines, (7) locomotives. They will be considered in the order named.

Mine Fans.—Modern fans have a mechanical efficiency ranging from 45 to 65 per cent from driving shaft to air delivered. The volume of air required depends on the tonnage of the mine and the number of splits. The pressure depends on the length of airways, their size and condition and also on the number of splits. Knowing the volume and pressure necessary and the efficiency of the fan it is easy to determine the size of motor required. In order to allow for the future extension of the mine it is always well to provide a motor that is somewhat over-large at the time of installation; then as the mine develops it is possible to speed up the fan, with, of course, an increase in the power consumed. The load factor of a fan usually is unity and the demand factor is somewhere between 60 and 110 per cent, depending on the allowance made for the expansion of the mine.

Electric Hoists.—The factors for electric-hoist motors vary with the manner of their application and their values in any case should be estimated by competent engineers. In a well-designed hoist of the Ilgner type the five-minute demand factor is approximately unity,

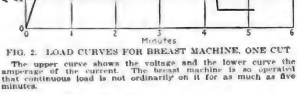


FIG. 2. LOAD CURVES FOR BREAST MACHINE, ONE CUT

The upper curve shows the voltage and the lower curve the amperage of the current. The breast machine is so operated that continuous load is not ordinarily on it for as much as five minutes.

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*Article entitled "Demand Factor of Coal-Mining Loads," read before a joint meeting of the Chicago Section of the American Institute of Electrical Engineers, the Electrical Section of the Western Society of Engineers, the Chicago Section of the American Institute of Mining Engineers and the Chicago Section of the Association of Iron and Steel Electrical Engineers.

†Electrical engineer, Peabody Coal Co.

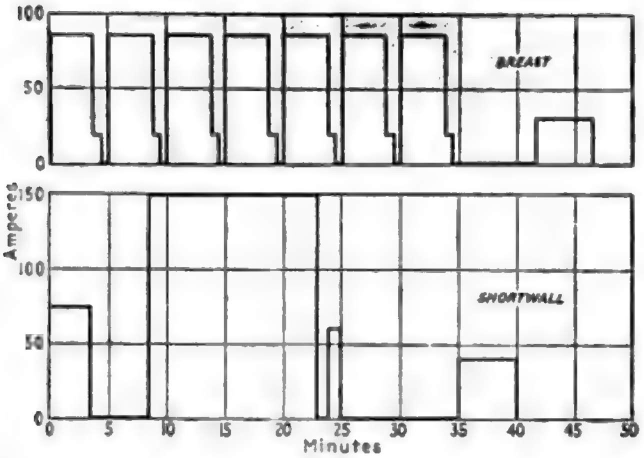

FIG. 3. COMPARISON OF LOAD CURVES FOR BREAST AND SHORTWALL MINING MACHINES

These idealized graphs represent the cutting of one 24-ft. room. Each breast cut takes an equal quantity of power while going forward, less power when backing out and no power while being pried over for the next cut. The shortwall machine cuts across the room without any delay and the graph is less complicated.

for the motor driving the flywheel set is just fully loaded when operating at the rated capacity of the hoist. The momentary demand factor, of course, is higher.

In Fig. 1 is shown a load curve on a 950-hp. motor of a flywheel set driving a 1,300-hp. direct-current hoist. Here the momentary demand factor is 112 per cent, and the five-minute demand factor is 84 per cent. This indicates that the output of the hoist could be increased by decreasing the caging time or increasing the speed of the hoist, or both. The average efficiency of four Ilgner hoists of 675 to 1,300 hp. in operation for several years is 45 to 48 per cent. Thus the kw.-hr. input and demand factor for a properly designed hoist can be easily predetermined.

Crushers and Washers.—This is more or less special application but the same general remarks would hold as are noted for the next class.

Shop and Tipple Machinery.—The selection of motors to drive ordinary tipple machinery is very generally understood and the demand factor usually will run high, as there are many times when the rate of output of coal is such that all the equipment is loaded. In such a case the combined demand factor possibly reaches 90 per cent. The total load rarely exceeds 150 hp., so in the average mine its determination is not an important electrical problem.

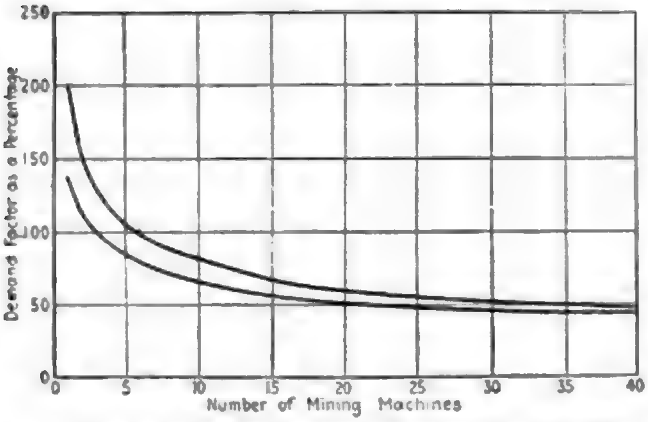

FIG. 4 CURVES SHOWING DECREASE IN DEMAND FACTOR AS MORE MACHINES ARE CONNECTED

The demand factor when forty machines are connected is about 4[illegible]. It has almost reached its low limit when that number of machines is connected. This curve is made by taking the curve for the shortwall machine and superimposing it a number of times on itself so as to obtain the lowest peaks.

Pumps and Booster Fans.—Pump motors usually are selected so as to be of ample capacity. This is done so as to allow for the difference in load either at the original location or at the one to which the motor at some time may be moved.

In the coal mines of the Illinois field pump loads are not ordinarily heavy. In one mine with fourteen motors totaling 225 hp. connected to pumps, the demand factor is 44.5 per cent. At another with seven motors totaling 65 hp. connected to pumps the demand factor is 54 per cent.

Mining Machines.—The manufacturers of mining machines have learned through years of experience what size of motor should be installed in any type of coal-cutting machine. The motors are rated on a one-hour basis, as the work is intermittent. The motors now installed on mining machines average from 22 to 25 hp. for breast machines and 30 to 50 hp. for shortwall machines.

Where the coal to be cut is extremely hard a single machine of either type may have a five-minute demand factor of 150 per cent. In easy cutting the demand factor of the same machine might not exceed 75 per cent of its rating.

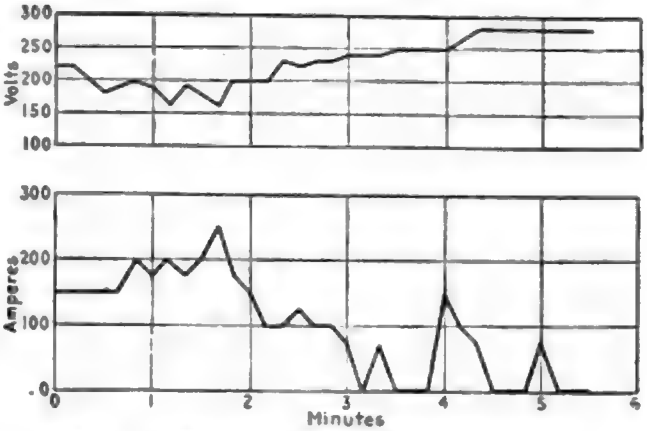

FIG. 5. TEST ON A SEVEN-TON LOCOMOTIVE

This locomotive hauled 19.8 tons of coal and 9 tons of cars a distance of 3,540 ft. The load factor of the run is 38 per cent. The return trip with the empties requires about three-fourths of the time and two-fifths the power. The whole load factor for one round trip does not exceed 25 per cent of capacity load.

An actual test on a breast mining machine for one cut is shown in Fig. 2. The operation of a breast machine is such that continuous load on the motor will not ordinarily exceed five minutes. The shortwall machine is designed to cut across a short face, such as the face of a room 18 to 35 ft. wide or an entry 9 to 18 ft. wide, at the rate of 12 to 24 in. per minute.

Fig. 3 shows a comparison of the characteristic loads of the two types of machines. The curves are not actual but represent the average results of a number of tests on such machines. The presence of various forms of impurities known to the miner as sulphur balls, black jack, slate or clay increase the load on the mining machine. This is a natural condition which usually is unavoidable.

Worn gears, cutter heads, guides and chains increase the load. The remedy is obvious. Lack of oil and dull cutter bits also increase the load rapidly. These are under the direct control of the machine runner. In some cases a set of bits may last a day but in worse

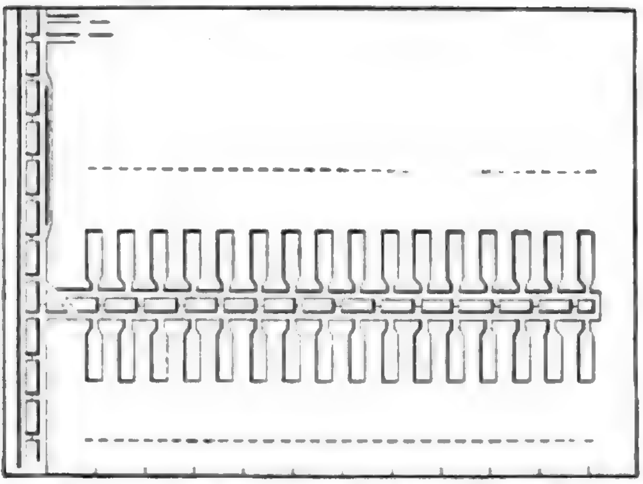

FIG. 6. PAIR OF ENTRIES WITH ROOMS FROM EACH

A typical territory served by a single gathering locomotive. As the runs into the rooms for coal are short, the 5-minute peaks are not as high as those with the main-haulage locomotive.

conditions six to twelve sets may be required. The number of bits used indicates the hardness of cutting and may be used as a guide in estimating the demand factor of any machine.

WITH MANY MACHINES DEMAND IS MADE REGULAR

By taking the curve for the shortwall machine and superimposing it a number of times on itself so as to obtain the lowest peaks the lower curve shown on Fig. 4 is derived. Next, assuming a momentary demand factor of 200 per cent load for one machine and the maximum continuous capacity, or about 50 per cent of the one-hour capacity, of a total of thirty machines, the upper curve is obtained. It is evident that for the assumed conditions the average actually obtained lies between the two curves. For easier cutting or less regular work done than that assumed for the curve of Fig. 3 both the curves are lower.

Thus it appears that for a large number of machines the demand factor for the group approaches, but never reaches, the load factor of one machine over the same period. Therefore it is necessary to know how much each individual machine works each day before the demand factor for a group can be estimated.

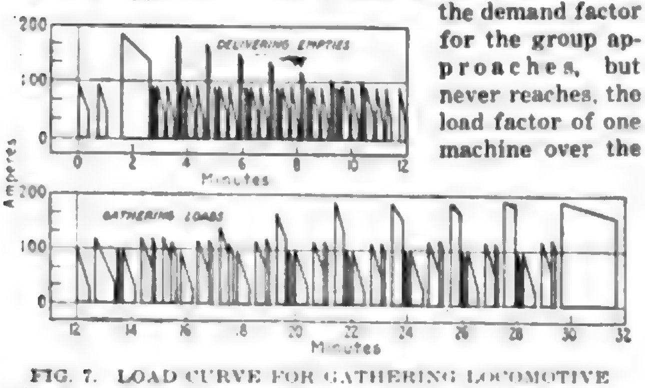

FIG. 7. LOAD CURVE FOR GATHERING LOCOMOTIVE

One round trip in territory like that in Fig. 6, hauling eight cars each way.

Locomotives.—The highest demand factor of a locomotive properly operated usually is predetermined by the manufacturers. The common practice is to equip the locomotive with 10 hp. per ton of weight. The one-hour current rating is about 90 per cent of that required to slip the wheels, thus the demand factor for a single locomotive is 110 per cent. The eight-hour rating is only 45 to 55 per cent of the one-hour rating, so that the load factor does not exceed 40 to 50 per cent.

The characteristics of coal-mine service of locomotives are extremely variable. A number of factors enter into their consideration, the principal ones being: Length of haul, ruling grades, short grades, condition of track and cars, voltage regulation on trolley, system of haulage, required output and concentration of coal.

A test on a haulage locomotive is shown in Fig. 5. The load factor for the run is 38 per cent. The return trip with the empties requires about three-fourths the time and two-fifths the power, so that including the time waiting on the parting and on the bottom the load factor does not exceed 25 per cent for one round trip. This, however, is too low for some installations where the run is longer and where the grades are easy, in which case large trips are hauled, giving a steady load.

Gathering locomotives have about the same momentary demand factor as haulage locomotives, but only in exceptional cases have they as high a five-minute demand factor. In Fig. 6 is shown a pair of entries with rooms being worked on both. The coal from this territory would be gathered by one locomotive.

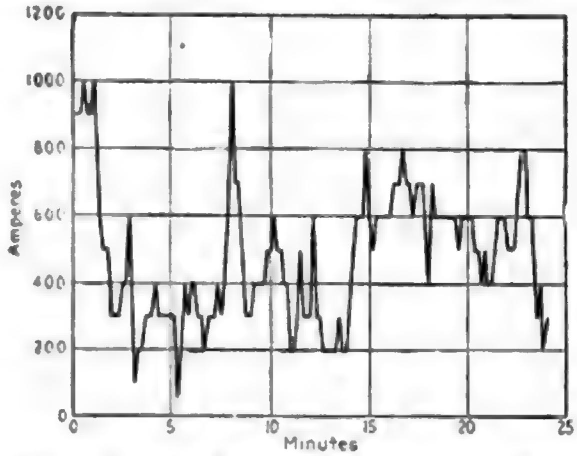

FIG. 8. LOAD CURVE ON 175-KW. GENERATOR SUPPLYING TWO 15-TON LOCOMOTIVES AND ONE 13-TON

The length of haul is 7,800 ft., the momentary demand factor is 64 per cent and the 5-minute 40.5 per cent. Readings were taken every 10 seconds.

The curve in Fig. 7 is based on actual time tests of a gathering locomotive and the current estimated from characteristic curves when this machine is operating in territory similar to that shown in Fig. 6.

The load factor for a single gathering locomotive is lower than for a haulage locomotive and the demand factor is the same for both, so that the demand factor for a large group of gathering locomotives is lower than for the same number of haulage locomotives. Fig. 8 shows readings taken every 10 seconds on a 175-kw. generator having two

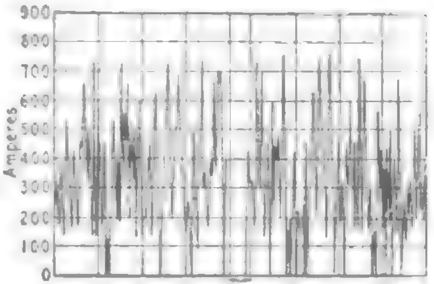

FIG. 9. LOAD CURVE ON GENERATOR

Generator is of 100 kw. capacity. It is supplying two 10-ton and one 7-ton locomotive hauling 2,900 ft. The momentary demand factor is 78 per cent.

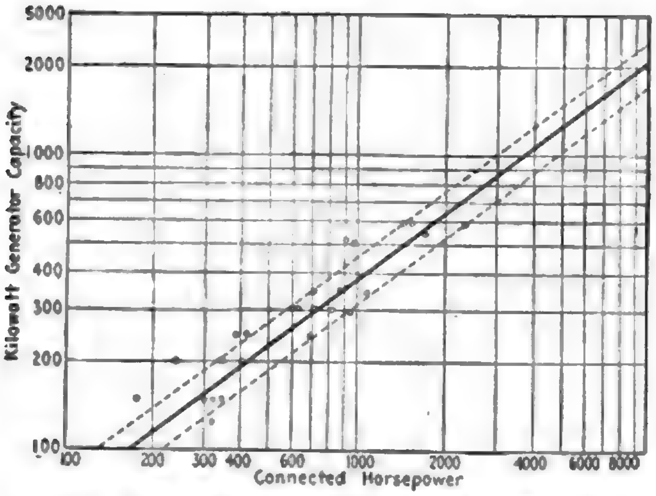

FIG. 10. CURVE SHOWING RELATION OF GENERATOR CAPACITY TO CONNECTED LOAD

This is based on the connected horsepower at twenty-six coal mines. The upper and lower broken lines may be taken as the maximum and minimum sizes of generators respectively that should be installed. The middle, solid line is a good average figure. This shows a demand factor of 83 per cent for small loads and 47 per cent for highest load included, assuming 50 per cent overload capacity of generator.

15-ton locomotives and one of 13 tons hauling an average distance of 7,800 ft. The load factor for 24½ minutes is 48 per cent and probably would be 40 per cent for eight hours. The momentary demand factor here is 64 per cent and the 5-minute demand factor is 40.5 per cent.

Fig. 9 shows readings taken at 2-minute intervals on a 100-kw. generator for eight hours during which two 10-ton locomotives and one of 7 tons totalling 270 hp. hauled 1,979 tons an average distance of 2,900 ft.

The four classes of equipment just considered are those most commonly in use and are those most important to the average coal-mine operator. Actual tests of maximum demand on direct-current generators over long periods are rarely made. Power-house attendants can keep a record of the number of times that the circuit breaker is out, and an engineer knowing this number and the setting of the breaker can obtain a general idea as to the adequacy of the generators installed.

Fig. 10 shows the sizes of the generators and the connected horsepower at twenty-six coal mines. From this data the upper and lower lines may be taken as maximum and minimum sizes of generators that should be installed. The middle line is an average that under general conditions could be used in providing generators. This shows a demand factor of 83 per cent for small loads and 47 per cent for the highest load included, assuming 50 per cent overload capacity of generators. In completely electrified coal mines, the number of which is constantly increasing, nearly all of the principal applications named have to be considered. Figs. 11, 12 and 13 show the five-minute load curves for one working day of each of three completely electrified mines.

The one for which Fig. 11 represents the five-minute load curve is a fully developed mine using trolley-reel gathering locomotives; Fig. 12 shows the same load curve for a fully equipped mine like the first except that in it storage-battery gathering locomotives are used, and Fig. 13 shows the load on a new mine which when developed will be similar in nearly all details to the second described. The present tonnage is about 50 per cent of that expected later. The demand factor at these mines is higher than for inside equipment alone, because the surface equipment includes the hoist and fan motors, which are continuous rated machines and have a high load factor.

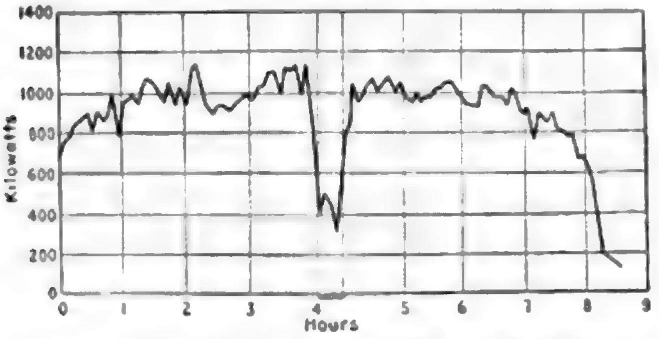

FIG. 11. FIVE-MINUTE LOAD CURVE OF TOTALLY ELECTRIFIED COAL MINE

Mine produced 4,807 tons in 8 hours. Equivalent alternating-current horsepower is 3,625. Maximum 5-minute demand factor is 1,130 kw. and 5-minute demand factor is 31.2 per cent. Trolley reel gathering locomotives used.

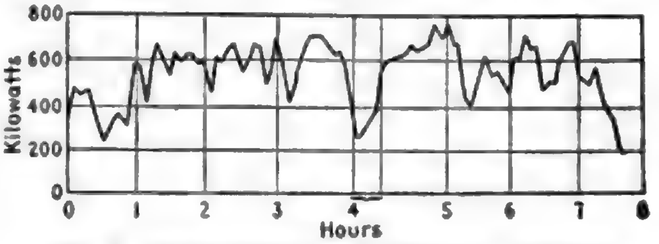

FIG. 12. FIVE-MINUTE LOAD CURVE OF ANOTHER TOTALLY ELECTRIFIED COAL MINE

Mine produced 3,493 tons in 8 hours. Equivalent alternating current horsepower is 2,529. The maximum 5-minute demand is 750 kw. and the 5-minute demand factor is 29.6 per cent. Storage-battery locomotives are used at this mine.

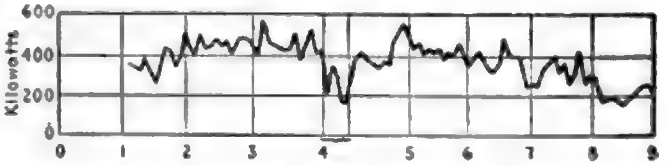

FIG. 13. FIVE-MINUTE LOAD CURVE OF A NEW COAL MINE, TOTALLY ELECTRIFIED

Mine produced 2,030 tons in 8 hours. Equivalent alternating horsepower is 1,653. The maximum 5-minute demand is 560 kw. and 5-minute demand factor 32.5 per cent. This tonnage is only 50 per cent as large as is expected later. When fully developed it will be operated in nearly all details as is the mine of which Fig. 12 is the load curve.

The U. S. Bureau of Mines has gathered data regarding methods of prospecting stripping coal used in Kansas and Oklahoma, with special reference to the use of the jetting drill. The bureau is also making a study of coal stripping operations in Indiana and Illinois.

In the study of the distillation of Freeport coal being made by the U. S. Bureau of Mines at Pittsburgh, Pa., the light fractions from the tars have all been examined and examination of the lubricating fractions is under way. A gradation of tar acids from the bottom to the top of the Freeport seam has been found, the highest acids being at the bottom. Other constituents show irregularities. Anthraxylon gives most tar acids and most anthraxylon is found at the bottom of the seam, so the results correspond. The heat of oxygen reaction with anthraxylon and with attritus is found to be the same. However, the anthraxylon is more sensitive to oxygen and has a greater tendency to spontaneous heating.

Making the Mining of Thin Coal Seams Profitable

Advantage of Lifting Bottom—Shaker vs. Belt Conveyors—Plan for a Longwall System with Conveyor Machinery—Value of the Stepped Face—Timbering Face and Guarding Conveyor—Cribs Built of Broken Props

By G. A. M. Rees
Dawson, N. M.

SOME suggestions as to the best methods of working thin seams, based on experience in this country, South Wales and England, may be of real value in view of the increasing number of thin seams being worked. In the United Kingdom methods have had to be adopted that will make available all seams over 12 in. in thickness. This necessity has caused the development of a system of mining suited to coal beds so thin that a car cannot be loaded in them without the lifting of bottom or the brushing of top. Of these there are many in the United States and the problem of working them in competition with thicker beds is one that demands careful consideration.

The system which I describe would have to be modified to suit the conditions in any particular locality. It is applicable to seams varying from 18 in. to 3 ft. in thickness with a tender, friable coal, under comparatively heavy to very heavy cover, the inclination of the seam varying from level to 5 deg.

Coal can be, and is, profitably worked under these conditions both by the longwall and room-and-pillar systems, the methods adopted being governed by local conditions. If the roof is of a clayey nature, which bends with fair readiness, the best method for its extraction would be longwall, either advancing or retreating.

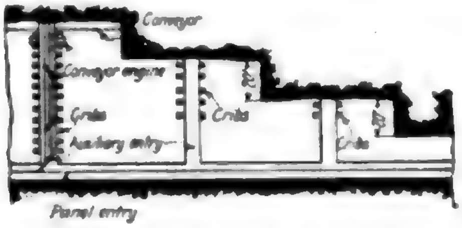

FIG. 1. LONGWALL ADVANCING WHERE TWO CONVEYORS ARE USED IN EACH AUXILIARY ENTRY

The panel entries should be 500 ft. apart and may be 750 ft. Subsidiary or cross entries or rooms are started at 500 or 600 ft. intervals. Three roads go up each room.

Seeing that when the longwall retreating method is used much expense is entailed before coal is obtained in any large quantity, it is better to work the coal on the advance. It should be cut by mining machines and loaded by face conveyors, the type of both to be decided upon for each installation, as each machine is adapted to some particular condition.

Both belt and shaker conveyors have given good results under normal conditions. Each has its disadvantages, but these are compensated by advantages that the other does not possess. The shaker conveyor—Blackett type—can be successfully adopted in thinner seams than the belt, or Sutcliffe, type, being considerably lower, but the shaker conveyor makes much more noise than the belt conveyor, which is an extremely important consideration when working under a weak, friable roof that needs diligent watching.

The seam should be laid out in panels, each panel to have its own split of the air current. Frequently the panels are each provided with two separate splits, and, in mines where large quantities of gas are generated, it is often advisable to adopt a multiple-split system. By this method a maximum quantity of air is circulated and the gas is removed more rapidly than where a single split serves for a whole panel. It has the additional advantage that it supplies the miners with good, fresh air, which they do not get when the air current is taken past several working places.

The main entries, which serve as the main haulage roads, should be driven in twos to fours, parallel to each other, the number being governed by the distance to be traveled, the gas which probably will be encountered, and the number of men working in each split, the mining laws of the different states having an important bearing on these matters. The distance between the parallel entries also will be governed partly by local conditions and partly by the provisions of the mining law of the state, but it should range between 30 and 50 ft. Care must be taken to avoid leaving pillars so small as to be incapable of withstanding the weight of the superincumbent strata, and judgment should be used to make them large enough to maintain the entries in fairly good condition.

If grades and roof cleats allow, the main entries should be driven parallel to the slips, or cleats, in the roof and coal, so as to allow the subsidiary entries to be driven approximately at a right angle to the cleats. In this maner the coal will be obtained with more ease than it would if worked obliquely. This provision is essential when the coal is mined by manual labor but is not of such importance where the coal is blasted.

The distance between main entries must be governed by local conditions and also will be dependent upon whether the seam is to be mined from both sides of each separate set of entries. If the coal is mined from only one side of the main entries, then a distance

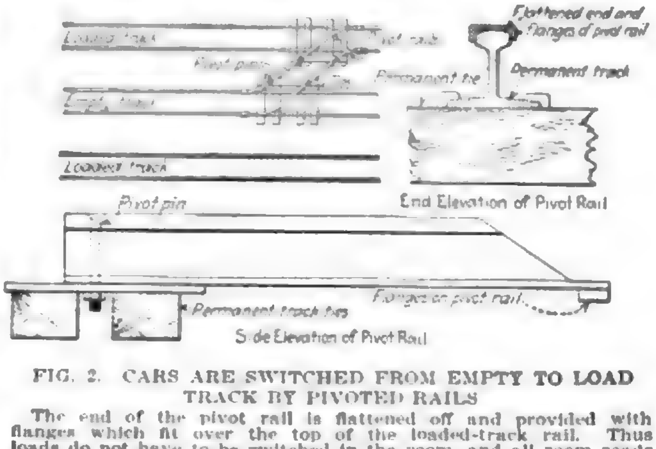

FIG. 2. CARS ARE SWITCHED FROM EMPTY TO LOAD TRACK BY PIVOTED RAILS

The end of the pivot rail is flattened off and provided with flanges which fit over the top of the loaded-track rail. Thus loads do not have to be switched in the room, and all room roads are unbroken by frogs and never have to be torn up.

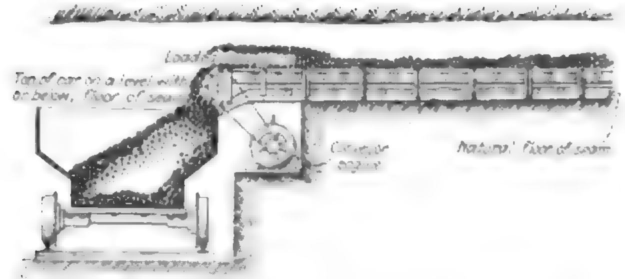

FIG. 3 WHERE BOTTOM ROCK CAN BE LIFTED

The conveyor can rest for almost its full length on the natural floor of the seam and does not have to lift the coal to get it into the car. A long conveyor is stressed enough on a level without having superimposed on it the additional stress which an upraise involves.

between them of 500 ft. will be found to be best. It may be increased beyond this, but is should never be more than 750 ft. If the coal is to be mined from both sides of the entries they may be driven from 1,250 to 2,000 ft. apart.

Subsidiary or cross entries should be started from 500 to 600 ft. apart, if two face conveyors are to be operated each feeding toward one cross entry. It is advisable that the line of the coal face be broken as shown in Fig. 1 and not continuous. When the coal face is thus stepped an extensive fall is not so likely to occur as when the face is straight. With a continuous unstepped face a fall so large might occur that it would interfere with the working and ventilation of the entire district. With a stepped face, if the roof should fall the break would be confined to the length of the step and probably would not extend for the full length.

Each step is made about 20 ft. in advance of that which succeeds it, so that each succeeding face is approximately opposite to the edge of the well-packed gob of the preceding step. This method has proved to be quite successful in friable roof.

The cross entries should be driven wide enough to accommodate three separate tracks—two for loaded cars and one for empties. The tracks and switches should be so laid that both load tracks can draw their empty cars with a minimum expenditure of labor. As it entails time and expense to pick up and relay partings, temporary switches are utilized, so that the track need not be torn after once having been laid down. The details of a switch which has given good results are shown in Fig. 2. If steel of fairly light weight is being used, the standard type of switch may be laid.

The tracks should be spaced so as to leave no unnecessary distance between them, for it is important that the entries be driven as narrow as possible. Care in this respect lowers the cost of timbering and the upkeep of the entry. The width of the roadway will vary considerably, as the cars at one mine are rarely the same width as at another.

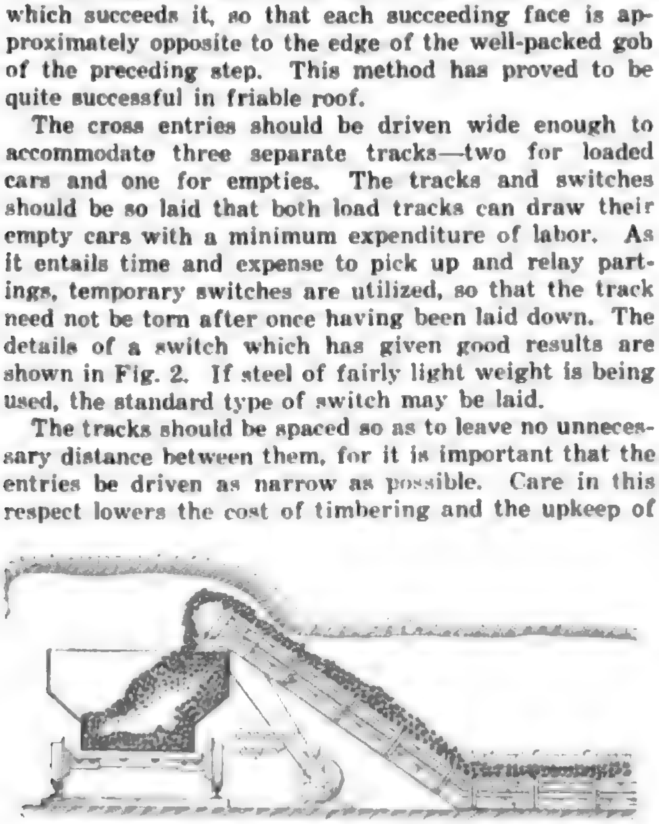

FIG. 4. WHERE THE ROOF IS BRUSHED DOWN

Excessively hard on a heavily heaving bottom makes it necessary to go into the top for height, but it is an extra burden on the conveyor and weakens the roof along the coal face.

As far as practicable, all brushing should be done in the bottom, so as to enable the conveyors to work to the best advantage. If the bottom rock is too hard for this purpose it will be necessary to make the conveyor elevate the coal for a short distance against the force of gravity. If the top is brushed the belt type of conveyor gives the best results.

It can be seen from Fig. 3 which method of brushing gives the conveyors least work to do and also takes best care of the draw slate. When the bottom is brushed, entry timbers can be placed underneath the top and across the primary roof supports and everything is kept intact. Consequently there is less chance that the draw slate will break down along the face.

When the floor is brushed a ledge should be cut in the underclay on either side of the cut to accommodate the conveyor engine. The distance between the bottom of the ledge and the natural floor of the seam would be approximately the height of the engine, thereby allowing the belt or shaker to work in a horizontal position. This would have to be modified if the cars were of such a size that the top of the car would be at a higher level than the bottom of the seam. In this case the ledge should be so arranged that the belt would be at a higher level than the top of the car.

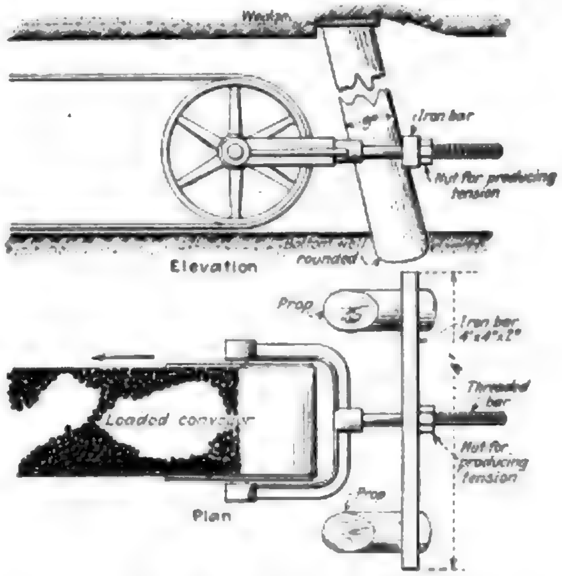

FIG. 5. HOW THE CONVEYOR IS KEPT TAUT

An iron crossbar is held in place by two 9-in. posts set on a batter. A yoke is attached to the rear pulley of the conveyor. This yoke ends in a threaded bar which, passing through a hole in the crossbar, is tightened by the rotation of a nut.

The belt conveyor is kept taut by means of a tension pulley, this pulley being kept in place by means of two 9-in. props set for this specific purpose. On no account should it be fastened to props used for supporting the roof. The duty of this pulley is to keep the belt from sagging unduly. When thus kept tight the belt when loaded does not foul with the rollers.

The best results have been obtained from belts from 20 to 24 in. wide when working seams up to and including 3 ft. thick. The speed should range from 2½ to 3½ miles per hour and the latter should never be exceeded. If it is the coal is likely to be broken, and the wear on the belt may be excessive. If the coal comes too

by Google

speedily the work of the man whose duty it is to "top off" the cars may be made difficult. Belts working at the speeds indicated have given satisfactory results, and, after three years' continuous service, were in fairly good condition.

Both types of conveyors, ranging from 400 to 500 ft. in length, can be removed and reset in their new position by three men in one shift of eight hours, and all the timbering needed can be done by the same crew.

The method of timbering and the size of timber must be carefully selected if the conveyors are to give the results desired, and the correct placing of the timbers at the outset should be given the personal attention of the mine foreman, this supervision continuing until the workmen fully understand what is required of them.

A method of systematic timbering should be adopted and rigidly adhered to. If any laxity is exhibited in this part of the work, the system will fail, and valuable machinery, and even lives, may be lost.

Split Prop Used as Crossbar Over Conveyor

The method of timbering should be as follows: The props in any row should not be more than 4 ft. apart and the distance between the rows should not exceed 4 ft. As a safeguard to the conveyor line, additional timbers should be set in the form of miniature sets of timbers, to be fixed as follows: A 3-ft. crossbar to consist of one prop split or sawed along its entire length, supported by two props, one under each end, no cap pieces or wedges being permitted on top of the crossbars. The maximum distance between the crossbars should not exceed 3 ft.

The distance between the props at the bottom should exceed that at the top and should be approximately 4 ft. This would insure that the maximum use would be made of the resisting and bending properties of the props. Furthermore, fewer props would be broken by the weighting of the roof.

The temporary props should have a diameter of from 2½ to 3 in. and the props set under crossbars should be 4 in. in diameter. The crossbars should be made from timbers of 6 in. diameter. Thus each bar would be 6 in. wide and 3 in. thick. Lightly shaving the end of each crossbar would insure the proper fitting of the props and the danger of any of them becoming dislodged would be eliminated thereby.

In the space vacated by the removal of the conveyor, chocks or cribs should be placed, at intervals which should not exceed 25 ft. One crib should be set at the side of the entry, the inside cribs being arranged on staggered lines. This arrangement is shown in Fig. 7. The spaces between the cribs are carefully filled with débris.

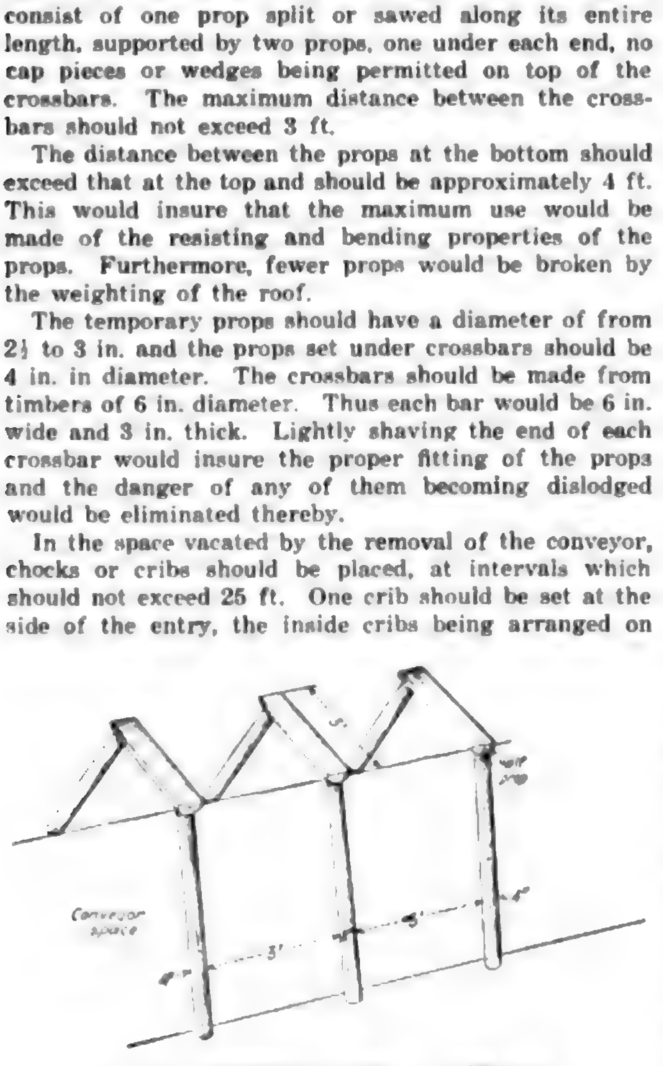

FIG. 6. TIMBERING OVER A CONVEYOR

The roof timber or cap is a 6-in. diameter timber split or sawed in two with the flat side uppermost. The legs are 4-in. diameter posts.

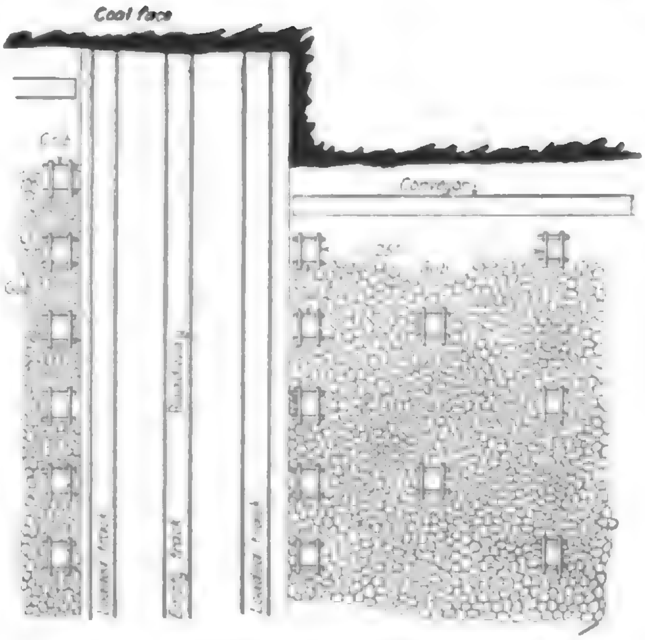

FIG. 7. LONGWALL FACE WITH CRIBBING

The cribs are built of broken props. The piles of gob are started from the sides of the cribs and built outward. The dimensions shown for the distances between cribs are in both cases larger than some of the roof conditions encountered will permit.

The cribs could be built of broken props, enough of these being made by this method of working to provide for that purpose. Cribs should range from 2 to 3 ft. square, or as near these figures as possible.

After the cribs are properly set, the spaces between them can be systematically packed and 94 per cent of the used timbers reclaimed for further use. The gob walls should be started from the cribs, the timbers being withdrawn as the packing is completed. This will insure that the roof will settle evenly on the gobs and in consequence few falls of any size will result. From observations I have made, the average settling on the gobs under this system is 4 in. per week per yard.

Cost Data Regarding an Anthracite Stripping Aggregating About Five Thousand Tons

By Dever C. Ashmead*
Kingston, Pa.

NOT all mining problems relate to the removal of large acreages of coal. Sometimes a small area requires as much skill for its extraction as one that is large, for if the problem of operation be not correctly solved the work may not be as profitable as it might and should be. For instance, some of the coal near the surface of the ground may have been mined some time in the past, leaving pillars which it would pay to remove. The breasts, however, may have caved, making it expensive and even impossible to remove the pillars by underground mining. Where the cost of such removal would be more expensive than the price of the coal would warrant, a small strip pit might meet the needs of the situation and might produce coal at an exceptionally low price.

At the mines of the Pine Hill Coal Co., near Miners-

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*Anthracite editor, *Coal Age*.

TABULATED STATEMENT OF COST OF WINNING COAL AT WHITE ASH STRIPPING

		Removing Cover						Per Month		Cumulative To Date		
Month	Days Worked	Supervision	Shovelman	Labor	Supplies	Coal and Water	Total	Estimated Cu.Yds. Removed	Cost Per Cu.Yd. Cents	Total	Cu.Yds. Removed	Per Yd. Cents
March	13	$66.00	$170.00	$115.65	$2.86	$55.12	$409.63	800	51.2	$409.63	800	57.2
April	23	66.00	170.00	353.38	125.38	92.52	807.28	2,000	40.3	1,216.91	2,800	43.4
May	23	66.00	170.00	632.39	14.49	92.52	975.40	3,400	28.7	2,192.31	6,200	35.3
June	13	33.00	85.00	313.98	8.35	55.12	495.45	600	82.5	2,687.76	6,800	39.5

		Removing Coal										
Month	Days Worked	Supervision	Shovelman	Labor	Supplies	Coal and Water	Total	Tons Of Coal	Per Ton Cents	Total Cover and Coal	Tons Of Coal	Per Ton Cents
June	13	33.00	85.00	231.10	81.34	27.56	385.00	1,252	30.8	3,072.76	1,252	
July	21	66.00	170.00	422.05	51.92	44.94	754.91	1,857	40.7	3,827.67	3,109	
Aug	18	55.00	142.00	277.62	33.21	38.52	546.35	1,617	33.8	4,374.02	4,726	92.5
Total	124	$385.00	$892.00	$2,346.17	$244.55	$406.30	$4,374.02					

ville, Pa., this difficulty was encountered, but here the company was fortunate in that the No. 1 W. A. gangway from the bottom of the No. 1 W. A. slope was open and an air hole 120 ft. deep had been driven to the surface. The outcrop of the coal was covered by about 20 ft. of surface, and above this was an old refuse bank about 20 ft. thick, making a total overburden of about 40 ft. which had to be removed in order to expose the coal. The management of the mine decided to strip this coal and dump it as mined into the air hole. An estimate showed that 6,800 cu.yd. of cover had to be removed to make available approximately 4,726 tons of coal. A small revolving steam shovel was used to handle both the cover and the coal.

Hoisting Engine Took Away Overburden

Work was started during the middle of March, 1921, and by the middle of June the overburden had been removed. The steam shovel loaded the earth and the refuse from the old dump into a small car. This was attached to the end of a rope and pulled by a small hoisting engine to the top of a refuse plane, where it was discharged. The accompanying table shows the detailed cost of removing this cover, the average cost per cubic yard removed being 39.5c. and the total cost being $2,687.76.

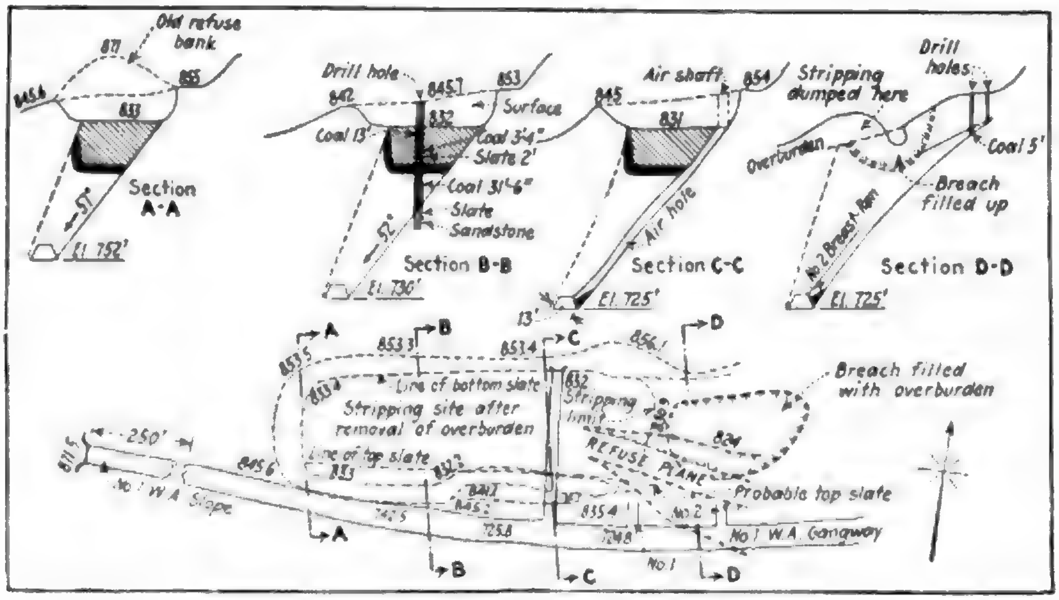
As soon as the coal was uncovered the shovel started to load it. By Aug. 20 it had been extracted as far down as it was safe to operate, the quantity obtained being 2,110 cars which would contain in normal underground operation approximately 2.24 tons per car. This figure probably is too low, as most of the mining is done in measures which pitch heavily, and in consequence the cars as loaded usually contain a large quantity of rock. As the coal loaded came from the Mammoth Bed, which at this point is quite clean, the yield from the strip-pit coal probably was much nearer three tons per car than 2.24 tons.

But, even using the smaller yield, the total cost of mining the coal, taking into account the cost of stripping the coal, was 92.5c. per ton, or a total cost of $4,374.02, as shown by the accompanying table.

Shovel Mined Away Under Hanging Wall

At this point the steam shovel had to be taken from the stripping because the hanging wall of the beds overhung so much that it was feared that a heavy blast might cause it to fall on the shovel. What coal remains will be mined by hand and sent down into the mine through the same air hole as was used by the steam shovel. Now that the work is being done by hand the overhanging wall can be properly supported by braces. It was impossible to place these while the steam shovel was in use, as they would have been in the way of the shovels.

It must be remembered that these figures merely include the cost of removing cover and coal and do not cover the cost of hauling coal to the breaker, cleaning, sizing and loading it into railroad cars and disposing of the refuse. The fact that the air hole and underground roadways were standing and in condition for use made conditions unusually favorable for operation.


Old refuse bank
871
855
845.6
833
Section A-A
57°
El. 752'
Drill hole
845.7
853
842
832
Surface
Coal 13'
Coal 3'4"
Slate 2'
Coal 31'6"
Slate
Sandstone
52°
Section B-B
El. 730'
Air shaft
854
845
831
Air hole
Section C-C
El. 725'
13'
Stripping dumped here
Drill holes
Overburden
Coal 5'
Breach filled up
No. 2 Breast
Section D-D
El. 725'
A
B
C
D
853.5
853.3
851.4
856.1
Breach filled with overburden
853.4
Line of bottom slate
Stripping site after removal of overburden
832
Stripping limit
824
Refuse Plane
871.5
250'
845.6
Line of top slate
853
832.3
No. 1 W.A. Slope
841.1
845.2
742.5
725.8
835.4
724.8
No. 2
Probable top slate
No. 1 W.A. Gangway
No. 1

Small Strip Pit

This pit was made to save some outcrop coal which had been left in early operation. The No. 1 W. A. slope and the air-hole driven at right angles to it on the footwall of the seam are parts of the old workings. One was used for the hauling of coal and the other as a slide for the coal which was mined by the shovel.

Electric Elevators Such as Serve Office Buildings Are Suitable for Some Kinds of Mine Hoisting

At Large Mines Elevators Are Useful for Hoisting Men, at Medium-Sized Mines for Raising All but Coal and at Small Mines for All Hoisting—Sometimes Save One Man

By Charles M. Means[*]
Pittsburgh, Pa.

CERTAIN classes of mine hoisting could be performed satisfactorily by the modern electric elevator if it were modified to suit mining conditions. It is safe, economical and easily operated.

Though the use of elevators in mining work seems a radical departure from long-established practice, in many districts they would fully satisfy the demand for low first cost and moderate operating expense, whereas the use of more expensive equipment would make the undertaking unprofitable.

In large, deep mines elevators can be used only for raising and lowering men—that is, for passenger service. At smaller operations a combination freight and passenger elevator can be used for handling men, supplies, and rock between surface and underground workings. In shallow mines of small capacity the freight elevator can profitably replace the ordinary hoist, performing all its duties even to the raising of coal.

Electrically operated freight and passenger elevators have passed the experimental stage. They have been in successful operation for many years in apartments, office buildings, warehouses and factories and are rapidly superseding the hydraulic elevator.

Why Has the Hoist Monopolized the Field?

It is true that they are not often found at coal mines, but that probably is due to precedent and also to the fact that the application of electricity to coal mining on a comprehensive scale is comparatively recent. When electricity was first applied to mine hoisting the steam engine was replaced by an electric motor, but the location of the equipment, the type of headframe, the style of cages and other conditions remained the same. Today manufacturers have evolved from the steam machine a compact-unit type of hoist and motor. This is in general use for all classes of hoisting regardless of the economy that might be obtained if elevators were used.

The passenger elevator, when applied to the larger deep mines and used for men only, can be placed in a compartment of either the main or an auxiliary shaft or it can be located in a separate ventilating or specially constructed shaft remote from the main openings. In either case the elevator would serve as an emergency or regular means of entrance to and exit from the mine where the depth is too great for stairways or ladders. It can also be operated independently and without interrupting the work of other hoisting equipment.

If the elevator is located at the main opening and is regularly used as the entrance to the mine, its movement probably will be regulated by a controller or push button located on the cage and operated by an attendant. This has an advantage over the ordinary hoist in that the operator is always with the cage and can either anticipate an emergency or else can act the instant an emergency appears.

If the passenger elevator runs in a shaft remote from the main opening it probably will be used as an emergency exit, and in this case it would be of the full-automatic type so controlled by push buttons at the landings and on the cage that it could be brought to any landing whenever it is not in use at some other level—that is, provided the safety gates are closed. An elevator of this type does not require an attendant and anyone can operate it with safety.

Small Mine Can Wholly Rely on Elevator

At a mine of smaller capacity a combination elevator—one for freight and passenger service—can be used for handling supplies, rock and men. This elevator would take the place of the ordinary auxiliary hoist. Where men are hoisted it preferably would be regulated by a man stationed within it, push buttons or a controller being the actuating means. When handling loads push buttons at the landings would regulate the movement of the cage. This would eliminate a hoisting engineer, as the men handling supplies can operate the elevator and also attend to their other duties.

For mines of medium size where the use of two cages and balanced hoisting for coal is warranted the elevator also has merit. In this case either self-dumping or platform cages can be used. The control would be full-automatic and the elevator operated by push buttons at the bottom so arranged that the cage cannot start until the man at the top has closed a switch in the case of self-dumping cages, or until the safety gate is closed in the case of platform cages. A signal system also can be used if desired, the hoist being started by the bottom cager, but not until he is so signaled by the top cager. This installation also would make a hoisting engineer unnecessary.

Makes Large Savings in Construction Cost

In taking up some of the merits of elevator installations at the smaller mines, consider, for example, a new mine opening in which the total lift is, say, 80 ft. and the mine is to produce 700 to 800 tons in seven hours. If the ordinary hoist is used it is necessary to construct a heavy headframe with batter legs and anchors, fit the headframe with substantial head sheaves, construct a separate building to house the hoist, build a rugged hoist foundation, and place the hoist in charge of a competent operator. On the other hand, if an elevator is installed, using a single counterbalanced cage, the same headframe is suitable (for the vertical stress is the same), the batter legs and anchors are not needed, the hoist house is displaced by an inexpensive pent house on top of the headframe, and the head sheaves are eliminated as well as the hoist foundation.

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An elevator having sufficient capacity to raise a mine car loaded with 2½ tons of coal can be installed. This elevator can have a hoisting speed of 250 ft. per minute, thereby making the lift of 80 ft. in about 21 seconds. If only one hoist is made per minute the time of 39 seconds can be allowed for dumping the load, lowering the empty car and caging at the bottom. At this rate 150 tons of coal can be hoisted per hour, or 1,050 tons per day of seven hours, continuous operation. If 20 per cent delay is allowed, the production can easily reach 800 tons in seven hours.

It also is entirely feasible for the elevator operator to assist in caging at the bottom as well as dumping at the top. By this arrangement the mine using an elevator probably would have two less men on its payroll than the mine using a hoist. In any event one man on the tipple can be eliminated as well as the hoisting engineer. This saving would be a considerable percentage in the case of the small mine.

Elevator winding engines are of rugged construction and can be driven by either a direct- or an alternating-current motor, the motor being specially designed for hoist duty. Elevator control is flexible and almost any method desired can be used, although each application has special requirements and a control consistent with these requirements should be installed. The elevator also permits the use of all mechanical and electrical safety features as applied to the hoist, and in addition, in those applications where the attendant is on the cage, extra safety is afforded by the fact that the operator can see the operation at all times.

In general, the use of the elevator for mine work may seem a little revolutionary, and while the large high-speed hoist is necessary for its particular application, there are indeed many places where this hoist is used inconsistently with the conditions of application. If, on the other hand, each hoisting job is given the careful study demanded by the operating characteristics and local conditions it will be found that in many cases the elevator far surpasses the hoist from all standpoints.

Scheme for Meeting Peak Hoisting Loads

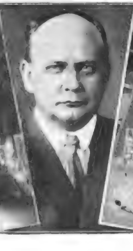
An article under this title by J. L. Knight, chief electrician of the E. E. White Coal Co., Glen White, W. Va., suggests a scheme by which a rotary converter connected to the line drives a direct-current motor carrying a heavy flywheel. When a peak comes on the hoist, the flywheel drives the direct-current motor as a generator feeding current back to the line by way of the rotary converter, thus assisting the hoists over the peak.

In regard to this article, A. E. du Pasquier, of the Metropolitan-Vickers Electrical Co., of Trafford Park, Manchester, England, writes under date of June 2: "This scheme was developed and patented by the British Westinghouse Co. over seventeen years ago and the first exemplification of it was installed in connection with the electric winding engine of the Maritime pit of the Great Western Colliery Co. and was fully described in a paper read by the late Hugh Bramwell. Later the British Westinghouse Co. installed a similar equalized winding engine for the Lingdale property on the Northeast Coast. The British Westinghouse Co., as you probably know, was acquired by the Metropolitan-Vickers Electrical Co., Ltd."

A NEW INVESTIGATION to be undertaken at the Experimental Mine of the Bureau of Mines, near Pittsburgh, Pa., has for its object the determination of the following factors in the problem of coal-mine ventilation: (1) Most practical method for the measurement of flow of air in mines; (2) resistance of flow of air under various conditions of surface, cross section and obstructions; (3) coefficient of friction; (4) simple formula for mine ventilation calculation; (5) flow of heat in coal and shale.

Illinois Central R. R. Has Its Whole Organization "Count the Scoops" to Save Coal

J. W. Dodge, Illinois Central fuel economist, preaching "Count the Scoops" to everybody from division superintendent down to "car whackers." This conservation car goes everywhere on the system.



L. W. Baldwin, vice-president, who told the International Railway Fuel Association in Chicago that the coal-saving methods on his road prevented the waste of 30,000 tons a month.

Exhibits like these, in various yards and roundhouses, bring home the lessons of coal thrift with much force because they are always in sight and they "speak" a language that cannot be misunderstood.

Proposed Moffat Tunnel in Colorado To Open Up Vast Coal Field

WITH the passing of the Moffat tunnel bill by the Colorado State Legislature the opening of one of the world's greatest coal fields is now assured. The State Supreme Court has been asked to give its opinion as to the constitutionality of the bill before Governor Oliver Shoup signs it. More than 65,000,000,000 tons of coal in Colorado and Utah are available in the district, for which the Moffat tunnel will provide feasible, in place of impossible, transportation conditions.

According to Professor R. D. George, State Geologist, the passage of the bill brought recently from Governor Simon Bamberger, of Utah, the promise that every aid will be given to the Moffat road to extend its line from its present western terminus through to Salt Lake City. A report current in Denver is to the effect that Governor Bamberger and other interests already have obtained the right of way for that extension. The Utah State Engineer is now at work on the survey of the line through the Uintah basin, where construction is expected to begin.

MOFFAT TUNNEL DRIVEN THROUGH MOUNTAIN PEAK

The Moffat tunnel will be driven through James Peak, and it is estimated that it will be more than 6 miles long. A vast wealth not only of coal but of other minerals will be made available by the construction of this new link, the need for which has been long felt. The passing of the bill ends a sixty-year fight which was begun by pioneers of the state.

When completed the tunnel through the peak will form part of what will be the shortest transcontinental line through Colorado. Besides the coal fields there are over 7,000 square miles of oil-shale deposits in northwestern Colorado and northeastern Utah. Strata of an asphaltic nature occur in this district, and clay, copper ores, gold, gypsum, graphite, lead, manganese, mercury, molybdenum, marble, salt, scoria, silver, slate, sulphur, tungsten, zinc and other minerals are found.

According to Professor George, the greatest coal areas of northwestern Colorado and northeastern Utah lie along the Moffat (Denver & Salt Lake) R.R., and the line laid down for the extension beyond the proposed tunnel and the Denver & Rio Grande Western R.R.

COAL BED THREE MILES WEST OF EDDY, COL.

The coal is more or less pockmarked, as frequently happens near the surface. It will be noted that the seam is dipping steeply to the left and apparently even more rapidly into the body of the hill.

OPENING OF TWENTY-FOOT SEAM IN LAY, COL.

Sixty-five billion tons of coal are said to stand ready to be rendered available as soon as the Moffat tunnel is built and in working order.

The following is an incomplete list of the coal areas that the Moffat will lay open for operation:

Yampa coal field in the upper valley of the Yampa River in the region of Steamboat Springs; Danforth Hills and Grand Hogback coal field, located in Moffat, Rio Blanco and Garfield counties; coal fields of northwestern Colorado and northeastern Utah, including the Western Yampa, Lower White River and Vernal coal fields, located in Rio Blanco and Moffat counties, Colorado, and Uintah County, Utah; Deep Creek coal field, located on Upper Deep Creek, west of Vernal and north of Fort Duchesne, Uintah, County, Utah; Black Tail Mountain coal field in eastern Wasatch and western Duchesne counties, Utah.

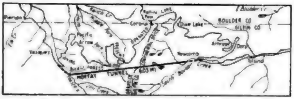
A REGION WITH EXTENSIVE AND THICK COAL BEDS

The Yampa coal field is said to cover an area of approximately 1,200 square miles. Estimates taken from the United States Geological Survey show that there is a probable reserve of 39,000,000,000 tons. These deposits are of a good grade of bituminous coal. Some anthracite of good quality also is found.

Approximately 360 square miles of coal area is found in the Book Cliffs district of Colorado. The Danforth Hills and Grand Hogback area covers approximately 375 square miles. This district extends from Moffat County, through Rio Blanco and into Garfield County. The Deep Creek coal field is on Upper Deer Creek west of Vernal, Utah, and north of Fort Duchesne, in the same state.

The Black Tail Mountain field only awaits transportation facilities for its development. This area, according to state data, is approximately 150 square miles in area and contains a tonnage estimated at 1,857,600,000. The Deep Creek field will yield 35,000,000 tons of coal.

The new cut-off will replace a line 32.62 miles long by one of only 9.32 miles. That, however, is not its chief merit. The original line had a grade equivalent to 4 per cent for 26.89 miles of the 32.62 miles of its length. The tunnel will be nearly level and will be only 6.03 miles long. The approaches to be built to the tunnel site will be at one end only 1.96 miles and at



SHOWS PROPOSED TUNNEL AND ITS CONNECTIONS

Also the old winding road to the north, which looks more like a contour or stream line than a working railroad. Note the loop, however, at a place of that name where only by crossing over itself could the heights aimed at be attained. The highest point on the railroad, Corona, is 11,660 ft., or 1,100 ft. over two miles high. Mont Blanc is only 15,700 ft. high, or a trifle over 4,000 ft. above the railroad in Rollins Pass.

the other 1.31 miles long, and the grade will be equivalent to 2 per cent. The heavy grade, the immense snowfalls and slides and the irregular alignment have made the Denver & Salt Lake R.R. extremely hard to operate. In consequence the coal fields that it taps have been practically shut off from the market and the road has been principally operated for its remarkable scenic value. With the tunnel built the road doubtless will have a large coal traffic.

Coal Cutter Having Variable-Speed Drive Cuts Seam with Controller Wide Open

IN ORDER to enable a coal-cutting machine to make speed wherever conditions favor it, a cutter of new design was built by the Goodman Manufacturing Co. and in March, 1920, was set to work. It was dubbed the universal control shortwall cutter. Since then this company has placed several of these machines in numerous operations throughout the country.

In this machine both rope drums have duplicate functions. Either drum may be driven by power, but not both simultaneously. Both of these rope drums have two speeds, high and low, the high speed being seventeen times the low speed. Both the high and low speeds of both drums are provided by a variable-feed drive and are thereby under perfect control. On either high or low gear the working speeds may be varied to exactly suit existing conditions—that is, they may be made anywhere from nothing to full-gear speed.

The variable control of the feed may be used for sumping with the right-hand rope and for the running cut with the left-hand rope. All movements of the machine may also be made under this same variable-speed control. This speed variation renders it possible to operate the motor with the controller always fully open, the resistance being used only in starting. Sumping and running cuts are practically one continuous operation.

Sumping may be accomplished with the right-hand rope on controlled low speed. When this sumping cut is finished, the power is thrown to the left-hand rope and immediately without shifting jacks or ropes, the machine begins to cut across the face. Low speed is used in sumping and on the running cuts. It is so geared as to give a cutting speed adapted to the particular mining conditions under which the machine is to operate. There are places, however, even in mines which are regarded as having uniform conditions, where unusual cutting is sometimes encountered. For such places the feed is regulated by means of the variable-speed control.

BRIEF PAUSE BETWEEN SUMP AND SHORTWALL CUT

As a matter of fact the speed is regulated in a manner essentially automatic, for by adjusting the friction control just tight enough under normal conditions to pull the machine at full-gear speed the feed will automatically slow down when hard cutting is encountered. Then when the cutting becomes normal again the proper full-gear feed will automatically be resumed.

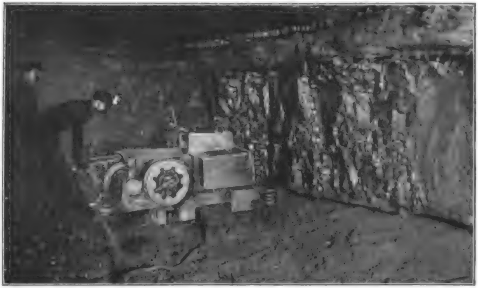
The interval between the finish of the sumping cut and the beginning of the running cut is negligible, for after sumping with the right-hand rope the friction control of the variable-speed drive is loosened, the power shift lever is reversed and the friction control again is tightened so as to start the running cut with the left-hand rope. The controller is not touched during this operation and the motor continues running at full no-load speed.

In all movements of the machine within the working room from the time when unloading is started till the time when the machine is reloaded advantage is taken of the variable-speed control, yet every operation or movement dependent upon the ropes is under the control of the variable-speed drive. Consequently the motor always runs on an open controller. This effects important savings in power, otherwise lost in the resistance. It also increases the life of the resistance and reduces the frequency with which controller contacts are burned out.

This type of control renders possible the use of both ropes in a natural and time-saving manner. Each is unwound from a drum for the first jack setting. When

Beginning a Cut

Machine sumping in at the face of a room, the pull of the lead rope serving to swing the cutter around as it advances under the coal. Note position of the machine in respect to the coal face. The chain guard retreats as the chain cuts its way into the solid coal, so that protection becomes unnecessary.



Ending a Cut

The former lead rope is now a tail rope holding the cutter in proper position while it completes its shortwall cut. Naturally the speed with which the machine is required to travel varies from the sumping to the shortwall position and according to the the resistance of the coal to be cut. The speed of travel may vary considerably yet no electric control is needed to permit of such wide variations. Where the work is easy the speed is rapid and where hard the speed is slow.

the right-hand rope is wound up in sumping, it is ready for use as a tail-rope on the running cut. On the completion of the cut across the face an ample length of this rope is unwound for the reloading operation. When the machine has been loaded the right-hand rope is completely wound upon its drum; the left-hand rope is almost completely wound up at the completion of the face cut.

There is no possibility of injuring the machine or of breaking the rope by simultaneous application of the power to both drums, for the power shift releases one drum before it engages the other.

While the Universal shortwall machine retains all the merits of the standard undercutter that have been developed during the past decade, it extends and duplicates features of the older one in such a way as to obtain more production with less effort. Various details have been given increased strength in order to meet the greater stresses imposed by the faster work made possible by the new type of control.

The new machine may be motored and equipped to cover the entire range of power requirements and physical conditions encountered. Either direct or alternating current in all mining voltages may be used in 35- to 50-hp. motors. These latter may be either open or inclosed. The truck may be made standard, of the low type or provided with a turntable. Various lengths of cutter bars also may be employed, while the rate of full-gear feed may be made suitable to the coal and the nature of the cutting.

A guard for the cutting chain also is provided. This telescopes into the base of the machine as it makes its sumping cut into the coal. A tilting shoe is also placed across the base for guiding the machine so as to enable it to follow a rolling bottom and avoid unduly hard places. This undercutter is provided also with rear and side openings for clearance of the cuttings. It is fitted with the usual four-point drum type of controller.

Because of its general design and the nature of the control employed this machine has been likened to a two-armed worker whose right and left hand are of equal power and deftness.

U. S. Government Is Training 130,000 War Veterans in Trades and Professions

With more than 130,000 students enrolled, the U. S. Government is conducting the largest trade and industrial school in the world. This "school" is the rehabilitation division of the United States Veterans' Bureau, through which the government is training these veterans in a trade, industry, profession, business or in agriculture.

The instruction in these vocations is furnished in leading colleges, technical schools, commercial schools as well as in business establishments, shops and on farms. These men are in training in every state in the Union and in every large city in the country. In all the large industrial centers these men who have received this intensive training from the government are available for positions. Every vocation is represented and any employer who needs additional personnel will be furnished such personnel from his vicinity in short time by notifying the Veterans' Bureau. Not only is this personnel trained in the best schools available but they have also received practical instruction on the job in industrial establishments and in shops.

These men are not permitted to terminate their training until the bureau is assured that they are skilled workmen and capable of carrying on in the vocation for which they are trained, and meet the requirements of the commercial, industrial and agricultural world. The courses of instruction vary in length from one year to four years while the average length of a course is two years.

The impression that the majority of men who are receiving vocational training suffer from amputations is erroneous, as statistics compiled by the Veterans' Bureau show that less than 2 per cent of the men in training suffer from amputations. The other 98 per cent have disabilities such as shrapnel and gun-shot wounds and other disabilities to which the civilian population is subject, such as heart trouble, bronchial diseases and minor disabilities. These men, however, are not permitted to select courses of training in which their disabilities will be a handicap or interfere in any way. Those persons who have tuberculosis are not permitted to take vocational training until the tuberculosis is arrested or inactive. The disabilities of the majority of the vocational students are not noticeable and in no way prevent them from successfully competing with civilian workers on an equal basis.

THE UNREAD ARE the easy prey of the Red.—*Columbia Record.*

LUCKILY FOR THE PUBLIC, neither capital nor labor is so inhuman as the other says it is.—*Boston Herald.*

Problems of Operating Men

Edited by
James T. Beard

Need of the Certification of Shotfirers in the Practice of Coal Mining

Evident Intention of the Law to Insure Safety of Mine Workers — Foremen Held Responsible Though Not Rightly Blamable — Law Weak in Relation to Shotfiring in Mines

IN almost every issue of *Coal Age* for the past seven or eight years there has appeared a letter, from one or another of its many correspondents, discussing the dangers arising from the use of explosives in coal mines.

Of late, the opinion of those participating in this discussion seems to have crystallized into the conviction that, until the law provides for the examination and certification of shotfirers and their employment in every mine, there is little hope of lessening the frequency of accidents due to blasting.

That the intention of the law makers was to insure increased safety in the use of explosives, by forbidding the employment of incompetent men to fire shots, is evident from the following clause of the bituminous law, which reads: "Only competent persons who have the necessary training and skill, and who have been properly instructed in the work and duly authorized by the mine foreman shall be allowed to fire shots electrically in any mine." (Art. 11, Rule 89.)

It is not evident, however, that this intention is fully carried out. While the law stipulates the condition under which shotfirers shall be employed and states their qualifications and duties, it fails to specify the degree of skill and nature of the training required. Instead, it places the whole responsibility of determining the competency of shotfirers on the mine foreman.

The Foreman Responsible

Of course, the mine foreman is not to blame for the burden imposed on him by the law, nor for the failure of a shotfirer in performing his duties. Yet he is held responsible by the superintendent for the daily output of the mine. Any falling off in the daily tonnage is a reflection on the foreman.

As was once remarked by a correspondent, the foreman must often take chances that would make a superintendent's hair stand on end when a shotfirer fails to report for work. He is forced to employ anyone who is willing to act in that capacity, and considers himself fortunate if he can find a substitute.

It is often difficult to get men to undertake work requiring the handling of explosives. The pungent quality of the smoke and gases produced in blasting, so affects a man unaccustomed to the work that he is generally laid up the following day with a severe headache and a feeling of lassitude, which makes him reluctant to endure the ordeal a second time.

To overcome this difficulty and make the work safer, many coal companies impose the work of shotfiring on their assistant mine foremen; but it was soon discovered that any additional safety gained in the assistant's capacity as a shotfirer was lost in his capacity as an assistant. The duties of shotfiring exacted too much time and infringed on the attention that should be given to supervising the miners. For this reason, the practice was largely discontinued.

Where the Shotfiring Law Is Not Sufficiently Adequate

It is readily seen that the provisions of the law relating to shotfiring, work a hardship on the men, the mine foremen, and on employers alike and that, instead of giving assurance of safety, the present law is a source of weakness from which arise the majority of accidents that occur in the handling and use of explosives. The law, in this respect is fundamentally weak, as I will try to show.

From the law we learn that a shotfirer must have ability to examine for and detect, by means of his safety lamp, the presence of explosive gas in working places. Whether the ability of a shotfirer to examine for gas and to determine the safe condition of his lamp must be equal to that of a fireboss the law does not say. But common sense demands that it must be so, since safety depends on the experience and judgment of a shotfirer, in the examination of a working place before firing a shot therein.

Mistakes in judgment, carelessness, and haste may prove costly, and these cannot be repeated with impunity in the presence of a dust-laden atmosphere containing even a small percentage of explosive gas. The shotfirer must be able to judge and determine whether holes are properly placed, and must refuse to charge any that are not. He must also possess a knowledge of the dangers existing in thin pillars, bad roof, dusty atmospheric condition, improper timbering, and other physical conditions.

The law further states that a shotfirer must be able to speak English. Why not, also, read English? In work of this nature, much will depend on a shotfirer being able to read and inform himself regarding those provisions of the law that relate to his work and duties. He should read the yearly reports of mine inspectors, detailing at length the accidents resulting from the use of explosives and the manner in which they occur.

Bureau of Mines Publications

Bulletin 17 and Miners' Circular No. 7, issued by the Bureau of Mines contain many facts relating exclusively to explosives, and published for the use of shotfirers and mine officials. From these and other books one learns how to make an intelligent selection of explosives; what constitutes the determining factor of choice; what strength of detonators to use; the proper ratio between the length of the charge and the depth of the stemming; the maximum charge limit; the danger of firing two or more shots at the same time, in the same working place; and other equally important facts.

Concerning these facts the law gives no information. If these books be regarded as supplementing our mining laws, the shotfirer who cannot read is a constant menace to life and property when on duty in the mine. It is in raising not lowering standards of competency that the path to safety lies.

Again, the law mentions no qualifications as to citizenship on the part of a shotfirer and yet, in every other field of endeavor where the welfare and the lives of many are dependent on the judgment and the work of a few, citizenship, character, age, skill, and experience are fundamental requirements.

These are a few of the immediate qualifications of competency that should be required by law of every shotfirer, before he is permitted to be employed in that capacity. Too often, however, as our own experience has taught us, it takes a long time to have laws enacted to meet even an urgent popular demand. However, pending our efforts to secure legislation insuring the examination and certification of shotfirers, the plan might be tried that has worked well in other activities of mining; namely, undertaking first-aid and mine-rescue work.

For this commendable work the

Bureau of Mines has not only trained thousands of men, but has prepared textbooks for those taking these courses. For the work of training shotfirers the means are already provided. Numerous textbooks on explosives and blasting, prepared by some of the Bureau's engineers have been in existence for several years.

All other necessary equipment are in the possession of the Bureau; and it has in its employ experienced lecturers and demonstrators who could, in this as in other fields of mining, by means of short intensive courses in the different branches of shot-firing, instruct and train within a short time a sufficient number of men to meet the present urgent demand for competent men.

There may be difficulties in the way of carrying out this plan; but its discussion, in the columns of *Coal Age*, may lead to the removal of these difficulties or to the suggestion and adoption of a simpler and better plan.

ALEXANDER WAUGH.

Finleyville, Pa.

Things That Are Wrong

Recent mine disasters call attention to need of greater care in various ways—Mining laws often not progressive—Lack of sufficient co-operation among mine officials a cause of danger.

THE columns of *Coal Age* have recently cited instances of disasters that have caused the death of twenty-five men in Pennsylvania and nine in Kentucky mines. The records of these happenings cause us to think, with deep regret, how such disasters might have been avoided and lives saved.

Not long ago, in a brief article in *Coal Age*, I stated that most of these accidents in mining were the result of criminal negligence on the part of someone. I want, now, to emphasize that remark without attempting to place the blame on any particular person but, rather, on the permitting of customs and methods that can and ought to be improved.

SEEK TO ELIMINATE DANGERS

My thought is that when we give more attention to eliminate customs and methods that are dangerous, and endeavor to ascertain what is wrong in our present system, and do everything in our power to improve conditions and insure safety in the mines, we will abandon the prevailing idea that mine disasters are a "part and parcel of the industry."

We will find there are several causes that lead to unsafe conditions and must be removed before we can guarantee safety in mining. Allow me to mention one or two things that, to my mind, are wrong and should be remedied in the interest of safety.

One point has reference to the Bituminous Mine Law of this state, relating to the required qualifications of certified mine foremen. The law states that candidates for a certificate of competency must have five years' experience, "as miners or mining engineers or men of general work inside of the mines of Pennsylvania." (Art. 24, sec. 4).

Now, why does the law restrict the experience to that acquired in the mines of this state. Let some man who is fully qualified in mining matters come from another state where he may have served as mine inspector, or held a responsible position in mining, a number of years, and we are ready to crucify him.

LAW FAILS TO RECOGNIZE EXPERIENCE GAINED IN OTHER STATES

Before such a man can become eligible to a mine-foreman's position, or even hold the position of fireboss, he must serve at least five years in a Pennsylvania mine, unless he is fortunate enough to be considered, by some operator, as equally competent with a certified man and is appointed to one of these positions under the revised certificate law.

Our law, in this regard, does not appeal to me as progressive. It does not recognize the value of men whose experience has been gained in other fields. A man may hold a certificate of competency in another state, but it becomes of no value to him in Pennsylvania. The tendency is to keep many experienced men from seeking positions in the state.

Another condition that invites disaster in mines but one over which we have less control, is the habit that prevails very widely among miners of considering themselves as good as the mine foreman over them. A large number of miners think they know better than the boss and are prone to disobey the instructions given them.

MINE OFFICIALS MUST CO-OPERATE

The same is true of some underofficials, assistant foremen and firebosses. In other words, there is a lack of cooperation on the part of these men. They are what I call "knockers." Many a time I have heard an assistant foreman speak of his superior in office, in a manner to show that he was an assistant only in name.

If we are to avoid mine disasters, there must be co-operation on the part of all mine officials and the men; all must pull together. Let no one aspire to a position that he is not competent to fill. He will only injure himself and endanger the mine in his charge.

In our mines, we have an abundant supply of air for ventilation and whenever I hear of a mine explosion I cannot but think that the lack of proper ventilation was the real cause. Perhaps, the plan may have been good but the circulation not properly carried out by all concerned.

Some one asked me not long ago what was the meaning of "Safety First." My reply was, "The practice of Safety First involves being sure before you act." Let these oft-repeated reports of mine explosions warn each of us that we must take time to consider what it means to be safe.

Parnassus, Pa. C. W. ATKINS.

Foreman Supreme in the Mine

Room for improvement in mine foremen—Lack of early education a handicap—Authority supreme below the grassroots.

MANY interesting points have been brought out in the letters referring to the relation of the mine foreman to his superintendent. The whole trend of the discussion points to an increased interest in progressive management in mining.

In these days when the demand for coal is slack and the high prices paid for mining and mine supplies leaves but little, if any, margin above the cost of production, the question of progressive management is most important.

ROOM FOR IMPROVEMENT, BECAUSE OF HANDICAP OF MOST FOREMEN

I quite agree with a former writer in *Coal Age*, who expressed the idea that mine officials compared favorably with those in other industries. Still, I believe there is room for improvement. The question in my mind is: Where a mine official is not progressive, how can he be made so?

Speaking of the mine foreman, he is the man responsible for the production of coal in the mine. To my mind, take them as a class, mine foremen are sadly handicapped in more ways than one. On this account, we must not blame a foreman too harshly if he appers narrow minded or set in his way when he believes it is right.

As we all know, most mine foremen entered the mines as trapper boys, or as helpers for their fathers or older brothers, at an early age. For this reason, the education of the average foreman, today, is limited.

Again, we know that the large majority of these officials are overworked. In their desire to produce a large output of coal at a low cost, they are assuming heavy burdens that demand their time, night and day, with little cessation or relief.

FOREMAN A SUPERMAN

Not only must the foreman of a large mine watch the ventilation and oversee the men working in their places; but he must plan for the future, study the development of the mine, foresee the troubles that are in store for any lack of watchcare or judgment on the part of himself and his assistant. Were he not a superman and ambitious to make good for his company, the mine foreman would break down under his burden.

With another writer, I hold that the authority of a mine foreman should be supreme underground; or as someone has put it, "supreme below the grassroots." If the foreman is not big enough to wield this authority get some one who is.

Being in charge of all labor in the mine, the foreman should be left alone in dealing with his men. Being responsible for maintaining the daily output of coal, he should have unlimited control of all operations underground.

When it is found he does not fill the bill get some one who will; but give him every chance and do not judge his failures harshly.

There are, I regret to say, instances of where mine foremen show a lack of interest in their work. A foreman may assume a wrong attitude toward his men, or display a want of tact and fail to get the work out of them for which they are paid. There are foremen who will lose their temper and bawl men out when something goes wrong; though the chances are the foreman is himself to blame for not giving the men the necessary instructions or providing proper tools and supplies for their work.

MUST INSPIRE HIS MEN

By reason, or cajolery if necessary, the foreman must inspire his men with action. He must know what he wants a man to do, and tell him how the work can be best performed, so that the man will labor intelligently and show a greater willingness to obey his instructions.

Leadership requires personality, patience and tact, together with regard for the well-being of one's men. More than anything else, there is required a good knowledge of human nature and a willingness to put oneself in the other man's place; in other words, to view things from his standpoint.

Allow me to say in closing, that a practical mining experience of, at least five years, I believe is necessary before a man is able to properly direct others in that work. There must be coöperation between all mine officials; although, as I said before, the foreman's authority underground must be supreme, provided his qualities come up to the standard.

Altoona, Ala. JOHN W. JONES

Reasons Why It Is Safer to Seal Abandoned Areas

Cause for alarm when large abandoned areas are left open — Accumulated gases may explain many mine explosions.

ONE writer, in *Coal Age*, has given his verdict against sealing off an abandoned area, chiefly because of the liability of spontaneous combustion taking place owing to the heating of the gob.

In my experience where such heating has been observed on one end of a gob area and the management has decided to seal off the openings at that point, the result has been to improve the conditions at once, and no danger has been experienced from the cutting off of the circulation by the building of the seals.

It is my belief that there is more cause for alarm when a large abandoned area is left exposed than when it is sealed off by building good concrete stoppings in all the openings. I have known of cases where drillholes have been sunk from the surface to act as bleeders; because the management became alarmed in regard to what might be the condition existing behind the seals.

Consider, for a moment, what may result from a slight explosion taking place in the live workings lying beyond a large abandoned area that has been left unsealed. The condition of this area in respect to gas and dust may be such as to greatly augment the force of the explosion, which would otherwise be only a local affair but is now extended throughout the mine.

This, in my opinion, may have occurred in some of our large explosions, in the past, and is an argument in favor of sealing off such areas and allowing no connection between them and the live workings. I have no hesitation in saying that the sealing off of many large abandoned areas, in our Pennsylvania mines, would be a step taken in the right direction.

The sealing off of these areas would not only reduce the liability to extending a local explosion of gas or dust throughout the mine; but would have the effect of assisting the ventilation of the live workings, by confining the air current to the proper roads and air-courses. Less power would then be required to produce the same air, which would mean a considerable saving in the cost-sheet.

In many instances, there are headings that act as bleeders of old gobs, and it is clear that the cost of a few seals to prevent this will more than offset the extra cost of ventilation in such mines. Of course, during the drawing back of pillars when a gob is in its making, such a condition cannot be avoided, as the section cannot be sealed until it is finally abandoned.

There are doubtless other benefits to be derived from sealing off old workings, which can only be realized fully by those who favor this practice. Although sealing is becoming more and more essential each day, there will still be those who cannot be convinced that it is the safest method to pursue.

Gans, Pa. R. W. LIGHTBURN.

Inquiries Of General Interest

Effect of Exhausting or Blowing on Pumping

Pump Located at Foot of Slope Pitching 30 Deg.—Water Gage 1 in. at Pump, on Intake When Fan Is Exhausting —What Will Be the Effect When Fan Is Blowing?

HERE is a problem that I would like to see answered in *Coal Age:* What is the theoretical lift of a pump under the following conditions: The pump is located on the intake airway, 750 ft. from the surface. The sump is on the return airway and 1,200 ft. from the fan. The quantity of air passing on the intake when the fan is exhausting is 73,200 cu.ft. per min., while the quantity measured on the return is 76,800 cu.ft. per min. These measurements are taken on the intake and return airways, respectively, at a point near the location of the pump. The water gage reads, one inch at this point. Both airways are 10 ft. high and 14 ft. wide, being driven on a slope pitching 30 deg. The question I wish to ask is, What difference will it make on the lift of the pump when the fan is forcing or blowing air into the mine instead of exhausting the air, as at present? DAVE HUNTER.

Washoe, Mont.

It is impossible to form an intelligent judgment of the situation, in this case, from the description and data given. If it is assumed that the pump is located 750 ft. from the surface, as measured on a 30-deg. slope, the discharge head is one-half this amount or 375 ft., to which must be added the friction head depending on the quantity of water the pump is to handle and the size of the discharge pipe reaching from the pump to the surface.

From the data given, however, there is no means of determining the present lift of the pump. The sump is said to be 1,200 ft. from the fan, supposedly located on the surface; but it cannot be assumed that the sump drained by this pump is 1,200 — 750 = 450 ft. further down the slope, as that would far exceed the possible lift of the pump under any conditions.

It is reasonable to assume that the pump is located at the foot of the slope and the sump some distance back in the workings, at about the same elevation. On this assumption, the question is, What would be the effect on the suction lift of the pump caused by changing the circulation in the mine, from the exhaust to the blowing system? In reply to this question, the only data of value is the statement that the water-gage reading at the pump is 1 in. when the fan is exhausting.

Disregarding the other data as having little or no bearing on the effect of the proposed change, it can be said that, when the fan is exhausting, the mine pressure (as indicated by the 1 in. of water gage) is below that of the atmosphere and, when blowing, it will be the same above the atmosphere. This makes the difference in pressure, 2 in. of water gage, or 2 × 5.2 = 10.4 lb. per sq.ft.

Evidently, the difference in suction head, or the lift of the pump due to this change, will be the same as the difference in water-gage reading, or 2 in. In other words, by changing the action of the fan, from exhausting to blowing, the total head under which the pump must operate will be decreased by 2 in., which is so small relatively as to be inappreciable. The increased mine pressure when the fan is blowing acts to assist the work of the pump, by decreasing the effective head.

The given reading of the barometer (25 in.) would indicate that this mine is located at an elevation of a little less than 5,000 ft. above sea level. At that elevation, the practical lift of a pump will not much exceed 0.9 × 25 = 22.5 ft. The size of the airways and the quantity of air in circulation have no bearing on the problem.

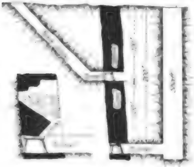
Examination Questions Answered

Miscellaneous Examination Questions

(Answered by Request)

Question—*Explain briefly two ways of opening a vertical seam of coal and state, in a few words, the general plan by which such a seam can be worked with safety.*

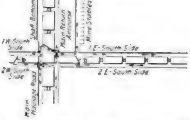
Answer—As shown in the accompanying figure, a vertical coal seam can be reached through a rock slope and cross-tunnel; or a shaft can be sunk at a short distance on the side of the seam where the inclination approaches the shaft. At different depths, cross-tunnels are driven from the shaft to the seam, as shown in the figure. In either case of approach, levels are driven in the seam to the right and left of the cross-tunnel. When this has been done, the coal, in each lift lying above the gangway level, is worked out by driving chutes up from the level, on a proper loading angle, and upraising in the seam, after the manner of overhead stoping. A manway is maintained, by strong timbers, up one side of each chute. In cutting out the coal, the miners stand on the loose coal that is permitted to fill the chute. This is shown in the small detailed section in the lower left-hand corner of the figure.



Question — *Explain how you would locate an underground stable, in a shaft mine, and ventilate the same, having in mind the rescue of the mules in case of emergency.*

Answer — In order to enable the ready rescue of the mules, in a shaft mine, in case of an explosion or mine fire making this necessary, it is important to locate the stable in close proximity to a shaft or other means of egress. In the accompanying figure, the mine stables are shown as located close to the shaft bottom and between the main hoisting shaft, which is the downcast for the mine, and the fan shaft or upcast, the mine being ventilated on the exhaust system. This stable is a wide opening driven between the first pair of south entries off the main heading, and the entries connecting the two shafts.

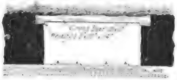
As shown in the figure, two air-bridges are built where the south entries leave the main headings (one pair running east and the other west), giving to each a separate air split. As indicated by the arrows, the stables are ventilated by a scale of air taken from the intake air-course or the 1 E-S entry. After going through the stable, this air passes directly to the upcast shaft and is carried out of the mine. Double doors having regulator openings in each door are provided at the return end of the stable, as shown in the figure. Also, double doors are provided at the foot of the main hoisting shaft, between the main intake and haulage road and the main return air-course. Single doors are shown in the crossover near the mouth of each pair of cross-entries.



The stable and its furnishings are constructed wholly of incombustible material. The floor is concrete and the walls coated with a good covering of gunite and whitewashed. The stable is well drained. In case of accident in the mine, making it necessary to remove the mules for safety, they are easily accessible from either shaft.

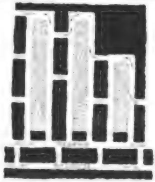
Question — *Explain and show by sketch how you would timber a double track parting so as to avoid the use of center posts for the support of the collars between the tracks.*

Answer—Heavy crossbars should be used and supported in hitches cut in the rib on either side of the parting, provided the coal is hard and will afford good support to the timber. One of these hitches is cut large enough to allow one end of the timber to be inserted first, and the other end is then slid into the hitch in the opposite rib, which must be cut long enough to permit this to be done. When the timber is in position it is securely wedged by driving double wedges beneath it, as shown in the figure.



Question—*What are the conditions that suggest the driving of double rooms, there being a track on each side of each room, with the gob stored in the center between the tracks?*

Answer—This is a common practice in some districts where the roof conditions permit of a wide opening and the coal is cut with machines. The arrangement is shown in the accompanying figure. One advantage afforded is a greater length of breast to be cut without moving the machine to another room. The width of pillar separating the rooms is correspondingly increased, which has the advantage of enabling the drawing back of the pillars by machines to better advantage than is possible with narrower pillars.



Under favorable conditions where the roof pressure it not too great, it is possible to make the cut on the end of the pillar. The coal, after being mined, is then loaded out on the track on each side of the pillar, which affords good loading conditions. Under less favorable conditions the pillars must be cut on the ribside, either by slabbing from breakthrough to breakthrough, or by cutting through the pillar a few yards back from the end and removing the remaining stump

Freight Loadings Average 150,000 Cars Per Day During Week Ended June 3

LOADING of revenue freight during the week ended June 3 totaled 750,645 cars, compared with 821,121 cars during the previous week, or a decrease of 70,476 cars. This reduction was due to the observance of Memorial Day on May 30. Comparisons showed that the average daily loading during the week of June 3 was 150,000 cars, while that for the preceding week was 137,000 cars. Compared with the corresponding week last year, the total for the week was an increase of 56,742 cars.

Coal loadings amounted to 86,626 cars, a decrease of 4,744 compared with the previous week and a decrease of 49,741 compared with the same week last year. It also was a decrease of 81,393 compared with the same week in 1920. Coke, with a total of 8,927 cars, showed an increase of 76 cars over the week before. This also was an increase of 4,307 over the corresponding week in 1921 but a decrease of 3,066 compared with the corresponding week in 1920.

Cars idle because of business conditions numbered 480,266 on May 31, compared with 504,702 on May 23, or a reduction of 24,436. Surplus coal cars in good order numbered 195,439, a reduction of 13,252 since May 23. Surplus coke cars totaled 5,275, or 171 less than on May 23.

Coal Produced at Commercial Mines in the United States in 1920*

(Excluding Product of Wagon Mines)

State	Loaded At Mines For Shipment (Net Tons)	Sold To Local Trade And Used By Employees (Net Tons)	Used At Mines For Steam And Heat (Net Tons)	Made Into Coke At Mines (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value Per Ton	Number of Employees: Underground: Miners Loaders, Etc.	Number of Employees: Underground: All Others	Number of Employees: Surface	Number of Employees: Total	Average Number Of Days Worked
Alabama	14,603,143	352,196	481,727	703,033	16,140,099	$58,637,000	$3.63	13,647	6,708	5,185	25,540	247
Alaska	58,522	128	2,461	...	61,111	356,000	5.82	85	20	102	207	240
Arkansas	1,968,916	11,196	70,484	...	2,050,596	9,328,000	4.55	2,390	964	612	3,966	176
California and Idaho	208	2,540	5	...	2,753	12,000	4.23	5	3	2	10	181
Colorado	11,249,746	450,969	291,522	281,988	12,274,225	42,817,000	3.49	7,543	3,462	2,706	13,711	255
Georgia	15,961	791	3,600	29,804	50,156	251,000	5.00	69	28	51	148	294
Illinois	82,510,029	3,736,533	2,384,331	...	88,630,893	273,140,000	3.08	53,363	23,630	10,091	87,084	213
Indiana	27,367,568	988,968	734,049	...	29,090,585	91,784,000	3.16	18,593	8,329	4,233	31,155	192
Iowa	6,899,214	702,187	173,515	...	7,774,916	30,606,000	3.94	7,677	3,080	1,148	11,905	250
Kansas	5,504,816	165,162	168,430	...	5,838,408	22,504,000	3.85	5,827	1,762	1,395	8,984	204
Kentucky	33,334,161	1,050,196	697,434	446,971	35,528,762	145,929,000	4.10	26,006	14,030	9,416	49,452	182
Maryland	3,887,333	101,311	41,595	...	4,030,239	18,607,000	4.62	3,283	1,347	918	5,548	207
Michigan	1,386,686	13,481	87,598	...	1,487,765	7,337,000	4.93	1,332	595	227	2,154	261
Missouri	4,722,598	406,318	137,649	...	5,266,565	21,747,000	4.13	4,842	2,023	1,973	8,838	233
Montana	4,079,281	149,816	174,769	...	4,403,866	13,890,000	3.15	2,304	1,120	780	4,204	250
New Mexico	3,147,268	43,376	38,852	453,944	3,683,440	13,568,000	3.68	1,858	1,082	798	3,738	302
North Carolina	8,660	...	2,880	...	11,540	81,000	7.02	25	15	10	50	288
North Dakota	725,289	144,757	37,579	...	907,625	2,618,000	2.88	526	227	357	1,110	218
Ohio	41,757,891	2,689,011	828,522	767	45,276,191	172,236,000	3.80	29,938	12,124	8,795	50,857	188
Oklahoma	4,582,437	53,902	193,949	...	4,830,288	23,205,000	4.80	4,415	2,463	1,366	8,244	217
Oregon	12,980	1,609	6,128	...	20,717	93,000	4.47	34	22	29	85	307
Pennsylvania (bituminous)	134,382,063	6,139,442	3,508,576	24,053,766	168,083,847	627,420,000	3.73	98,540	45,336	30,094	173,970	244
South Dakota	232	12,545	...	...	12,777	46,000	3.60	22	15	10	47	133
Tennessee	5,979,346	136,423	159,461	310,398	6,585,628	26,361,000	4.00	6,491	2,736	2,126	11,353	234
Texas	1,575,709	5,523	33,783	...	1,615,015	6,061,000	3.75	1,882	691	377	2,950	242
Utah	5,454,967	57,830	104,819	387,583	6,005,199	19,350,000	3.22	2,421	1,138	945	4,504	252
Virginia	9,219,622	298,973	103,012	1,622,499	11,244,106	44,579,000	3.96	5,937	4,616	3,457	14,010	262
Washington	3,466,784	87,663	150,770	47,876	3,753,093	14,544,000	3.88	2,387	1,579	1,028	4,994	260
West Virginia	83,199,005	2,946,638	1,035,460	2,269,604	89,450,707	386,900,000	4.32	50,236	32,657	20,057	102,950	198
Wyoming	9,258,825	121,451	242,995	...	9,623,271	28,716,000	2.98	3,982	2,350	1,447	7,779	264
Total bituminous	500,359,260	20,870,935	11,895,955	30,608,233	563,734,383	$2,102,723,000	$3.73	355,660	174,152	109,735	639,547	220
Pennsylvania (anthracite)	76,844,055	2,896,502	9,857,692	...	89,598,249	434,252,000	4.84	63,353	37,687	44,015	145,055	271
Grand total	577,203,315	23,767,437	21,753,647	30,608,233	653,332,632	$2,536,975,000	$3.89	419,013	211,839	153,750	784,602	230

* Compiled by U. S. Geological Survey.

Coal Produced in the United States in 1920*

(In Net Tons)

State	Small Mines: Loaded For Shipment	Small Mines: Sold To Local Trade	Small Mines: Total Quantity	Small Mines: Estimated Total Value	Total, including both Commercial and Small Mines: Loaded At Mines For Shipment	Total: Sold To Local Trade And Used By Employees	Total: Used At Mines For Steam And Heat	Total: Made Into Coke At Mines	Total: Total Quantity	Total: Total Value
Alabama	154,000	...	154,000	$773,000	14,757,143	352,196	481,727	703,033	16,294,099	$59,410,000
Alaska	...	...	...	...	58,522	128	2,461	...	61,111	356,000
Arkansas	51,000	2,000	53,000	264,000	2,019,916	13,196	70,484	...	2,103,596	9,592,000
California and Idaho	...	...	...	...	208	2,540	5	...	2,753	12,000
Colorado	1,000	3,000	4,000	12,000	11,250,746	453,969	291,522	281,988	12,278,225	42,829,000
Georgia	...	...	...	...	15,961	791	3,600	29,804	50,156	251,000
Illinois	64,000	30,000	94,000	369,000	82,574,029	3,766,533	2,384,331	...	88,724,893	273,509,000
Indiana	248,000	12,000	260,000	1,083,000	27,615,568	1,000,968	734,049	...	29,350,585	92,867,000
Iowa	30,000	9,000	39,000	188,000	6,929,214	711,187	173,515	...	7,813,916	30,794,000
Kansas	82,000	6,000	88,000	419,000	5,586,816	171,162	168,430	...	5,926,408	22,923,000
Kentucky	131,000	31,000	162,000	647,000	33,465,161	1,081,196	697,434	446,971	35,690,762	146,576,000
Maryland	28,000	7,000	35,000	208,000	3,915,333	108,311	41,595	...	4,065,239	18,815,000
Michigan	...	2,000	2,000	9,000	1,386,686	15,481	87,598	...	1,489,765	7,346,000
Missouri	89,000	14,000	103,000	483,000	4,811,598	420,318	137,649	...	5,369,565	22,230,000
Montana	3,000	7,000	10,000	33,000	4,082,281	156,816	174,769	...	4,413,866	13,923,000
New Mexico	...	...	...	...	3,147,268	43,376	38,852	453,944	3,683,440	13,568,000
North Carolina	...	...	...	...	8,660	...	2,880	...	11,540	81,000
North Dakota	21,000	20,000	41,000	106,000	746,289	164,757	37,579	...	948,625	2,724,000
Ohio	497,000	105,000	602,000	2,845,000	42,254,891	2,794,011	828,522	767	45,878,191	175,081,000
Oklahoma	18,000	1,000	19,000	90,000	4,600,437	54,902	193,949	...	4,849,288	23,294,000
Oregon	...	...	...	...	12,980	1,609	6,128	...	20,717	93,000
Pennsylvania (bituminous)	2,363,000	161,000	2,524,000	15,211,000	136,745,063	6,300,442	3,508,576	24,053,766	170,607,847	642,630,000
South Dakota	...	...	...	...	232	12,545	...	...	12,777	46,000
Tennessee	76,600	200	76,800	417,000	6,055,946	136,623	159,461	310,398	6,662,428	26,778,000
Texas	...	...	...	...	1,575,709	5,523	33,783	...	1,615,015	6,062,000
Utah	...	2,000	2,000	9,000	5,454,967	57,830	104,819	387,583	6,005,199	19,350,000
Virginia	134,200	300	134,500	867,000	9,353,822	299,273	103,012	1,622,499	11,378,606	45,446,000
Washington	4,000	...	4,000	16,000	3,470,784	87,663	150,770	47,876	3,757,093	14,560,000
West Virginia	513,000	7,000	520,000	3,145,000	83,712,005	2,953,638	1,035,460	2,269,604	89,970,707	390,046,000
Wyoming	6,000	1,000	7,000	24,000	9,264,825	122,451	242,995	...	9,630,271	28,741,000
Total bituminous	4,513,800	420,500	4,934,300	27,218,000	504,873,060	21,289,435	11,895,955	30,608,233	568,666,683	$2,129,933,000
Pennsylvania (anthracite)	...	...	...	...	76,844,055	2,896,502	9,857,692	...	89,598,249	434,252,000
Grand total	4,513,800	420,500	4,934,300	$27,218,000	581,717,115	24,185,937	21,753,647	30,608,233	658,264,932	$2,564,185,000

* Compiled by U. S. Geological Survey

With Superior Product, Australia Expects To Recover Coal Trade from Japan

By Randolph Bedford

AUSTRALIA'S export coal trade received a shock from the war from which it has not yet recovered, scarcity of shipping being one contributing cause and the war embargo on coal exports the other. Japan, with an inferior coal, has obtained the trade which the superiority of the Australian product must soon recover. Against that a slackening factor will be the increased export of American coal and the development of Chinese mining.

About 30 per cent of the total output of New South Wales coal is machine cut. There are 176 electric- and air-driven machines cutting 2,506,000 tons, according to the last yearly figures available, of which 1,846,000 tons is electric-machine cut, and 660,000 tons is cut by air-driven machines. About 17,000 men are employed in these New South Wales mines and the number, as in Queensland, must increase greatly as Australian collieries win back their Pacific Ocean markets. Japanese coal is no longer cheap, for its poor quality can never be bettered. It is in shipping space that Australia is poor and in transportation facilities America and Japan are rich. A representative analysis of Maitland coal shows: Moisture, 2.30 per cent; volatile hydrocarbons, 35.62 per cent; fixed carbon, 58.40 per cent; ash, 3.25 per cent; sulphur, 0.42 per cent. As a sample of the Ipswich field, Queensland, the analysis of the Aberdare seam may be contrasted. It shows: moisture, 2.2 per cent; volatile hydrocarbons, 28.4 per cent; fixed carbons, 62.1 per cent; ash, 7.3 per cent.

Queensland Operates Its Own Coal Mines

The State Government of Queensland, operating, as it does, more than 6,500 miles of railway, is a big coal user and has therefore established its own mines. Of these, Baralaba is a steam anthracite of good quality worked from a seam 8 ft. in thickness; the Styx River seam is from 4 to 10 ft. in thickness and of a quality that has proved highly satisfactory to the Australian Navy. The Bowen field—also operated by the state—will soon be equipped to produce 1,000 tons daily. Comparative analyses of these coals and of New South Wales and Ipswich coals are:

	Moisture	Volatile Hydro-Carbons	Fixed Carbons	Ash	Calorific Value, B.t.u.
Bowen seam	1.0	19.9	66.8	12.3	13,316
Bowen Garrick Seam	0.60	23.45	67.70	8.5	13,973
Styx River	3.0	28.0	60.7	8.3	13,387
Baralaba N.S.W.	3.5	10.1	74.9	10.4	13,860
New Castle coal measures	2.1	36.1	53.27	8.71	
Southern (N.S.W.) measures	0.71	23.65	63.98	11.66	
Western (N.S.W.) measures	2.5	32.31	53.08	12.56	
Ipswich coal field, Queensland	1.50	27.0	58.50	14.0	..

The field of Blair Athol has but one drawback for oversea shipping, it being 240 miles from the riverport of Rockhampton, with which it is connected by railroad. The Blair Athol coal measures carry three profitable seams—the top or "Little Seam" of bright bituminous coal 7 ft. in thickness and one 2-in. parting in the middle of it. Below this, at a depth varying from 3 ft. to 30 ft., is the Big Seam, which has a maximum thickness of 91 ft. of clean coal. On the southern edge of the coal basin it is 40 ft. thick and two miles north it is 72 ft. thick in the Newcastle east shaft.

Well-defined bedding planes throughout the seam are conducive to easy mining and a characteristic of this seam is the absence of vertical planes. It is a strong, hard coal and requires explosives; and the seam produces a high percentage of round coal.

The average of fourteen analyses taken by 5-ft. sections through the full seam and determined by the Australian Naval Department showed: Moisture, 9.0 per cent; fixed carbon, 59.38 per cent; volatile hydrocarbons, 25.26 per cent; ash, 6.32 per cent; sulphur, 0.35 per cent. The coal is dull and lusterless; it is non-coking, practically smokeless and burns to a fine white ash without clinker. It is hard and friable and ships well.

The third seam is 35 ft. below the Big Seam and is 7 ft. thick, with three small bands in it. The present market is purely local and the output about 200 000 tons a year. While it remains 740 miles from a deep-sea port it can have little effect on export trade but a shorter railroad is proposed to meet a deep-sea port in 150 miles.

For value and shipping facility, however, there is nothing to compare in Northeast Australia with the State coal mines of Bowen. The port is but 18 days from San Francisco and the low percentages of ash and moisture and the high calirific values stamp it as a field that must be a great factor in the industrial development of the Pacific.

Harrington to Be President of American Society of Mechanical Engineers

JOHN LYLE HARRINGTON, of Kansas City, Mo., has been unanimously nominated as president of the American Society of Mechanical Engineers, succeeding Dean Dexter S. Kimball, of Cornell University. Mr. Harrington headed the ticket selected by the nominating committee of the society, whose report was presented at the spring meeting held in Atlanta, Ga., May 8 to 11. Mr. Harrington is a consulting engineer of national reputation and is a member of the firm of Harrington, Howard & Ash. Mr. Harrington and the other officers named will be elected by mail ballot of the society's membership and will take office at the close of the next annual meeting in New York City in December.

JOHN LYLE HARRINGTON

Mr. Harrington's nomination as president is subject to the outcome of a letter ballot but nomination usually is regarded as tantamount to an election. Next December Mr. Harrington will be announced president unless an extraordinary number of members write the name of a dark horse on the vacant space in their ballots.

Vice-presidents of the society were chosen as follows: W. S. Finlay, Jr., vice-president of the American Water Works & Electric Co., New York; William H. Kenerson, professor of mechanical engineering, Brown University, Providence, R. I.; Earl F. Scott, president and manager of Earl F. Scott & Co., Atlanta, Ga., and H. H. Vaughan, consulting engineer, of Montreal, Can., to fill the unexpired term of L. W. Strothn of Milwaukee, Wis.

These managers were selected: A. G. Christie, associate professor of mechanical engineering, Johns Hopkins University, Baltimore, Md.; James H. Herron, president of the James H. Herron Co., Cleveland, Ohio; Roy V. Wright, editorial department of the Simmons-Boardman Publishing Co., New York City.

William H. Wiley, president of John Wiley & Sons, Inc., New York, is continued as treasurer and the following will serve as delegates to the American Engineering Council:

John Lyle Harrington, chairman; L. P. Alford, editor of *Management Engineering*, New York; A. M. Greene, Jr., professor of mechanical engineering, Rensselaer Polytechnic Institute, Troy, N. Y.; Fred J. Miller, consulting engineer, New York; Max Toltz, mechanical engineer, of Toltz, King & Day, Inc., St. Paul, Minn.; Fred R. Low, editor of *Power*, New York; S. W. Stratton, director of the U. S. Bureau of Standards, Department of Commerce, Washington, D. C.; Edwards R. Fish, vice-president of the Heine Safety Boiler Co., St. Louis, Mo.; Edwin S. Katte, chief engineer of electric traction, New York Central Railroad Co., New York.

World's Coal Output in 1921 Was Nearly 200,000,000 Tons Less Than in 1920

WORLD'S coal production in 1921 dropped back to the level of 1909, according to the U. S. Geological Survey. The total output was 1,120,000,000 metric tons, a decrease of nearly 200,000,000 tons when compared with 1920. The chief factors in the decrease were the British miners' strike and, more important, a worldwide industrial depression. The following table shows the trend of production for the last 13 years:

WORLD'S COAL OUTPUT, 1909-1921, AND PERCENTAGE PRODUCED BY UNITED STATES

(In metric tons of 2,204.622 lb.)

Year	Production (in Part Estimated)	Per Cent Produced by United States
1909	1,110,000,000	37.5
1910	1,160,000,000	39.2
1911	1,189,000,000	37.9
1912	1,249,000,000	38.8
1913	1,342,000,000	38.6
1914	1,207,000,000	38.7
1915	1,189,000,000	40.6
1916	1,257,000,000	42.7
1917	1,325,000,000	44.6
1918	1,331,000,000	46.4
1919	1,168,000,000	43.1
1920	1,317,000,000	45.4
1921	1,120,000,000	40.0

NOTE.—The figures for the years 1914-1918 in this table are revised materially from those hitherto published by the Geological Survey, to conform to more accurate reports from some of the countries affected by the war. They are still subject to revision.

Preliminary statistics of world coal production in 1921 issued by the Geological Survey are revised and amplified in the following tables. Returns have now been received from all the important coal-producing countries. The production in countries not heard from up to June 1, 1922, represents only about 4 per cent of the world's output, and an estimate for these countries has been included in the total. The margin of error in the total as now given does not exceed 2 per cent. Some of the figures shown are provisional and will be revised as final figures are received.

The term "coal" as used by the Geological Survey includes lignite, and the production for the world is simply the total of the quantities reported, without attempt to reduce inferior coals to an equivalent tonnage of coals of higher rank. When possible, however, lignite is shown separately from bituminous. The unit used is the metric ton of 2,205 pounds, the approximate equivalent of the long or gross ton.

COAL PRODUCED IN THE PRINCIPAL COUNTRIES OF THE WORLD IN THE CALENDAR YEARS 1919, 1920 AND 1921

(In metric tons of 2,204.622 lb.)

Country	1919	1920	1921
North America:			
Canada: Coal	9,756,019	11,812,871	10,636,471
Lignite	2,655,309	3,275,304	2,918,991
Greenland	2,160	2,308	2,200
Mexico	693,866	(a)	(a)
United States: Anthracite	79,915,483	81,282,000	79,400,000
Bituminous Lignite	422,618,927	515,886,000	369,200,000
South America:			
Argentina	(a)	(a)	(a)
Brazil	(a)	(a)	(a)
Chile	1,334,789	1,060,585	(a)
Colombia	(a)	(a)	(a)
Peru	330,227	361,075	(a)
Venezuela	33,287	30,377	(a)
Europe:			
Austria: Coal	90,472	132,864	137,470
Lignite	2,006,773	2,408,865	2,398,284
Belgium	18,482,880	22,388,770	21,807,160
Bulgaria	577,739	757,250	750,000
Czechoslovak Republic: Coal	9,865,605	11,143,221	11,648,399
Lignite	17,081,208	19,943,258	21,050,712
France: Coal	21,546,000	24,300,000	28,240,887
Lignite	895,000	1,000,000	735,[illegible]03
Germany: Coal	(b) 116,707,200	(b) 140,757,433	(b) 145,610,000
Lignite	93,645,500	111,634,000	123,011,000
Greece	182,951	182,880	134,000
Hungary	3,901,720	4,963,060	6,043,745
Iceland	390	....	....
Italy: Coal (c)	111,151	151,262	111,400
Lignite (c)	1,129,197	1,571,735	1,019,700
Netherlands: Coal (d)	3,540,064	4,115,629	4,167,960
Lignite	1,881,962	1,395,851	122,000
Norway	(a)	(a)	(a)
Poland	6,262,636	6,660,145	7,107,214
Portugal	146,341	169,165	(a)
Rumania	1,540,598	1,505,184	(a)
Russia	6,463,000	6,162,000	9,851,000
Spain: Coal	5,703,637	5,420,704	5,011,429
Lignite	539,872	552,425	408,684
Spitzbergen	(e) 88,776	(e) 120,000	(a)
Sweden	429,267	439,584	(a)
Switzerland	64,902	74,590	1[illegible],714
United Kingdom	233,467,478	233,216,222	166,99[illegible],000
Jugo-Slavia	2,497,394	3,274,324	(a)
Asia:			
British India	22,991,217	17,[illegible]	17,200,[illegible]
China	18,292,252	19,43[illegible]	(a)
Chosen	223,078	( )	[illegible]
Federated Malay States	194,363	251,[illegible]96	(a)
Indo-China	665,149	700,267	(a)
Japan (Inc Taiwan and Karafuto)	32,703,338	30,819,898	24,500,000
Russia	1,836,000	1,537,000	2,384,100
Turkey	481,331	(f) 700,000	(a)
Africa:			
Algeria	7,419	7,793	(a)
Nigeria (southern)	140,057	183,013	(a)
Rhodesia (southern)	462,698	524,796	521,404
Tunis	36,551	31,000	(a)
Union of South Africa	9,313,232	10,408,497	10,331,886
Oceanica:			
Australia	10,736,321	13,176,426	13,073,845
British Borneo	(a)	(a)	(a)
Dutch East Indies	949,379	1,095,718	(a)
New Zealand	1,877,506	1,873,296	(a)
Philippine Islands	32,892	58,888	(a)
Totals	1,168,000,000	1,317,000,000	1,120,000,000

(a) Estimate included in total. (b) Includes Saar Basin. (c) Includes new provinces. (d) Includes slack. (e) Shipments to Norway and Sweden. (f) Estimate based on incomplete data.

THE MINER IS QUITE WILLING to take his pick, but insists that it be between shorter hours or at higher wages.—*Manila Bulletin.*

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of May*

(In Net Tons)

Ports	Railroads	1922 Cargo	1922 Fuel	1922 Total	1921 Cargo	1921 Fuel	1921 Total	1920 Cargo	1920 Fuel	1920 Total
Toledo	Hocking Valley	617,287	16,103	633,390	821,739	20,518	842,257	126,136	1,859	127,995
	Toledo & Ohio Central	....	....	....	196,039	5,342	201,381	68,825	4,959	73,781
	Baltimore & Ohio	823,958	17,125	841,083	402,239	10,629	412,868	101,844	10,270	112,114
Sandusky	Pennsylvania	488,143	11,655	499,798	223,214	6,060	229,274	64,544	995	65,539
Huron	Wheeling & Lake Erie	7,612	334	7,946	424,250	11,132	435,382	301,890	25,451	327,341
Lorain	Baltimore & Ohio	17,820	3,353	21,173	625,935	24,727	650,662	387,512	43,496	431,008
Cleveland	Pennsylvania	43,358	6,704	50,062	512,323	20,143	532,466	38,664	6,522	45,186
	Erie	....	....	....	126,769	4,260	131,029	....	....	....
Fairport	Baltimore & Ohio	....	....	....	....	....	....	....	....	....
Ashtabula	New York Central	31,083	5,757	36,840	462,355	16,887	479,242	48,660	21,415	70,075
	Pennsylvania	28,342	2,113	30,455	532,897	17,128	550,025	51,344	16,138	67,482
Conneaut	Bessemer & Lake Erie	24,744	194	24,938	196,091	1,911	198,002	299,800	9,360	309,160
Erie	Pennsylvania	23,575	6,685	30,260	278,816	12,901	291,717	8,085	12,456	20,541
Totals		2,105,922	70,023	2,175,945	4,802,667	151,638	4,954,305	1,497,304	152,918	1,650,222

* Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, manager.

Retail Coal Men Unconditionally Agree to Cooperate in Hoover Price Plan

By Paul Wooton

Washington Correspondent of Coal Age

That Secretary Hoover has entirely justified his position in the controversy with the retailers is the consensus of opinion in Washington and in the communications from all parts of the country reaching officials. The retailers have agreed unconditionally to co-operate and the inclination at the Department of Commerce is to let bygones be bygones.

An important conference between all factors concerned in the situation was held with Secretary Hoover on June 15. Those in attendance were:

J. G. Bradley, president, Elk River Coal & Lumber Co. C. E. Bockus, president, Clinchfield Coal Corp. A. W. Calloway, president, Davis Coal & Coke Co. E. E. White, president, E. E. White Coal Co. A. M. Ogle, president, Vandalia Coal Co. J. J. Tierney, vice-president, Crozer-Pocahontas Co. Roderick Stephens, chairman of board of directors of National Retail Coal Merchants' Association. J. Maury Dove, Jr., director, National Retail Coal Merchants Association. J. E. O'Toole, executive secretary, National Retail Coal Merchants Association. J. D. A. Morrow, vice-president of the National Coal Association. E. A. Holbrook, Acting Director of Bureau of Mines. George Otis Smith, Director of the Geological Survey. F. R. Wadleigh, chief of coal division, Department of Commerce.

After the conference Secretary Hoover made the following announcement:

The conferences with Mr. Stephens, of the Retail Association, and his colleagues and their collaboration in conferences with the operators' representatives have planed out all difficulties. Their association has shown its full desire to co-operate to protect the public the best we all can in a difficult situation.

It has been settled with the representatives of the retail association that they will co-operate to secure: That all coal be sold at cost, plus a reasonable selling charge; that in localities where bituminous coal is sold for household purposes, existing stocks, as of June 1, of unsold pre-strike and contract coal, be reserved for the smaller household trade and such coal be sold at prices based upon cost plus usual handling charges; except for the above coal, the retail prices to be based upon average purchase prices, with usual handling charges, that retailers co-operate to prevent rising mine prices by calling the attention of the administration to price demands out of line with the established bases; that retailers handle coal on straight lines from operator and wholesaler without speculative resales in the trade.

Operators who have had a regular, established retail clientele, whom they have supplied upon special terms of deliveries and prices, even without contract, should continue to do so, but this statement also implies that such retailers give such benefits to their customers, and further that such retailers can be expected to give assurance that they will continue their connection with the operator in the future.

Following the meeting emphasis was placed on the fact that larger consumers should buy coal at this time, when unsold surpluses exist at Virginia tidewater points and in Alabama. If that type of consumer would make his purchases now it would make for a better situation later in the season, when the demand from small consumers will enlarge.

The situation with regard to prices and with regard to co-operation among operators was set forth in the following statement:

At the conference today between Secretary Hoover, together with Dr. Smith, Director of the Geological Survey, and Mr. Holbrook, Acting Director of the Bureau of Mines, the representatives of the National Coal Association and the National Retail Coal Merchants Association, the following statement from the Secretary was agreed to:

"In the fields where a price basis has not yet been established (or 15 to 20 per cent of the total tonnage now being produced) I earnestly request that each operator immediately reduce his selling basis for spot coal to the Garfield price, including the standard selling expense, plus such additions for increased costs as can be justified in his individual case. The complexity of local conditions, due to the strike and the entrance of many snowbird mines, makes the establishment of maximum prices very difficult in many districts. This plan, if adhered to, should result in a reduction of prices in several districts of Pennsylvania and western Kentucky. I have some assurances that this basis will be accepted for Pennsylvania, and I hope western Kentucky will also fall into line.

"My proposal to operators on May 31 was 'that the Garfield prices for run-of-mine coal should be the basis for computing spot sales prices, with such adjustments as are necessary to include the wholesale selling costs, changed conditions at the mines and other factors that will be fair to the public and to the operators and will maintain production of coal. Any agreement to adhere to this is a moral agreement between each individual operator and myself.'

"In addition, I requested, upon the advice of the Director of the Geological Survey and the Bureau of Mines, and after discussion with operators, that certain maximums of additions for changed conditions shall not be exceeded; for instance, in the case of Alabama, a maximum price of 25c. below the Garfield scale. In Virginia, West Virginia, Tennessee and parts of Kentucky, where the Garfield prices varied widely from a range of $2.65 for domestic to as high as $4.25 for export coal (including 15 to 25c. selling commission formerly separately allowed under the Garfield scales), it was requested that the additions to the Garfield scale should not accrue to more than $3.50 per net ton f.o.b. run-of-mine and that the differential of the Garfield scale for lump coal should be adhered to, as these are more favorable to the householder than usual differentials.

"Owing to the persistent misstatement or misunderstanding of elements inside and outside of the industry, the impression has been given in some quarters that the maximums constitute minimum prices and offer reason for some occasional taking of advantage of such price basis. It is in the interests of the good repute of the industry, as well as that of the public, that the above formula for computing prices in relation to the Garfield scale should be conscientiously applied by all operators. There have been but few violations of the spirit of this arrangement in the districts mentioned, as witness telegraphic advices from Virginia, West Virginia, eastern Kentucky and Tennessee, showing that the prices for spot coal vary from $2.50 to $3.25, with an occasional price at the maximum, but with an average of about $3. At the same time more than half the tonnage is moving as contract coal at averages below $2.25. Alabama coal is being offered at from $1.82 to $2.10.

"Sporadic complaints of selling expense being added to net prices, in dealing with wholesalers, will be taken up in each individual case."

With regard to the attitude of the retailers, a prominent official comments as follows: "The retailers were the only branch of the coal industry that entered into conferences with Secretary Hoover in a spirit of criticism of other branches of the industry. Their attitude was in striking contrast with that of the wholesalers, who from the very start have given 100 per cent of co-operation. The retailers' position soon developed into one of criticism of Secretary Hoover himself. They charged that he is too friendly to the operators. There is some evidence, however, to support the charge that the attack on Secretary Hoover was planned in advance by his chief critic and was not based on any remarks by Secretary Hoover on lump coal in the Chicago domestic market. While this critic had the support of his associates at first, it was not long until they were very ready to draw away from him. The attack on Secretary Hoover's plan for keeping the coal situation in hand carries a 'made in Chicago' label. What is there to justify the throwing of this local issue money-wrench into a machine that otherwise would operate smoothly.

Vinton Colliery Co. Obtains Order Nullifying Miners' Injunction

Justice Kephart, of the Supreme Court of Pennsylvania, granted a supersedeas order at Ebensburg, Pa., June 17, on petition of L. I. Arbogast, controller and secretary of the Vinton Collieries Co., of Vintondale, nullifying the temporary injunction issued earlier in the day by Judge John H. McCann in Common Pleas Court on petition of Arthur Garfield Hays, of New York; John Brophy, president of District 2, United Mine Workers, and others against the collieries company, restraining the company from interfering with meetings of the Mine Workers at Vintondale.

While a meeting of miners was held at Vintondale Sunday night, June 18, under the protection of the temporary injunction, the supersedeas will prohibit further gatherings until the issue is finally settled. The writ in the latter case is returnable in Philadelphia on Saturday, June 24. Mr. Hays, Mr. Brophy and other officials of the mine workers' organization will be required to appear at that time to show cause why the supersedeas order should not become permanent.

After the meeting Brophy declared that "If occasion warrants we will hold another meeting at Vintondale, which is the battleground where the fundamental right of free speech and public assembly is being fought."

J. J. Kintner, District Attorney of Clinton County and leading attorney for the United Mine Workers of America in District No. 2, on Monday, June 12, presented to the court at Ebensburg a petition for the preliminary injunction, to be made perpetual after hearing of the facts, restraining the Vinton Colliery Co. from interfering with the business of the plaintiffs, among whom also appear the names of Attorney Julian Roseberg, of the Civil Liberties Union of New York City; Arthur Shields, a Chicago newspaperman; H. S. Cooney, taxi driver; Nathan Burch, a Vintondale barber, and J. D. Bennett, who is in the feed and produce business at Vintondale.

Commerce Commission Investigating Car Distribution to Bituminous Mines

THE Interstate Commerce Commission on June 19 instituted an investigation into the matter of the justness, reasonableness and lawfulness of the rules, regulations and practices governing the distribution of cars to coal mines, other than anthracite, for coal loading, and as to the justness, reasonableness and lawfulness of the ratings for such mines as the basis for the distribution of cars to such mines.

Mine ratings are the basis for the distribution of cars to coal mines for coal loading. A just and reasonable basis of mine ratings will therefore tend to make effective a just and reasonable distribution of cars to coal mines.

The Car Service Division of the American Railway Association, after collaboration with the important bituminous-coal loading railroads and the National Coal Association, has submitted to the commission a proposed revision of the rules now incorporated in what is known as Circular CS 31 (revised) and also has proposed rules for the rating of and car distribution to other than tipple mines loading bituminous coal.

The commission is informed that while representatives of the National Coal Association do not agree in every instance that the rules proposed embody all that they might desire, they join with the Car Service Division in recommending the revision for early promulgation in all cases, except the assigned car rule, which is rule 8. That rule is now the subject of investigation under No. 12530, In Re Distribution Among Coal Mines of Privately Owned Cars and Cars for Railroad Fuel, which now has been consolidated with this investigation.

The commission desires to give opportunity for full hearing and discussion by all the parties interested in the subject matter. The initial hearing has been assigned before Commissioner Aitchison at Washington, July 17, 1922.

It is understood that the National Coal Association will appear by counsel before the commission at this hearing.

Illinois-Wisconsin Dealers Support National Association in Dispute with Hoover

SECRETARY of Commerce Hoover is called upon to "adjust incorrect and misleading reports" concerning the position the retailers of the country have taken toward Mr. Hoover's price-regulation plan, in a resolution adopted last week at the annual convention of the Illinois and Wisconsin Retail Coal Dealers' Association. The convention was held at Lake Delavan, Wis. The association listened to an address on the value of associations by Homer D. Jones, president of the National Retail Coal Merchants' Association, and then took a stand backing up the national in its controversy with Mr. Hoover.

The resolution was based on the premises that Pocahontas and New River coals form a large part of the fuel used in domestic heating in Illinois and Wisconsin, that the price of those coals advanced $1.75 a ton as a result "of recent conferences between West Virginia operators and Mr. Hoover" and that the association believes this is not the time to countenance a radical advance in prices of coal to domestic consumers "either with or without governmental or quasi-governmental approval."

The resolution reads: "We heartily endorse the action of the governmental relations committee on the National Retail Coal Merchants' Association taken the past week in presentation of facts to Mr. Hoover and recommend that steps be taken by Mr. Hoover to adjust incorrect and misleading reports which appeared in the press concerning such presentation of facts, which reports were exceedingly detrimental to the consuming public as well as retail coal merchants, who have suffered thereby. And be it further resolved that it is the intent and desire to continue serving the coal-buying public to the best of our ability by preventing unjust retail advances in the price of household coal."

The Illinois and Wisconsin association chose these officers: President, R. H. Jones, of Kenosha, Wis.; vice-president, R. D. Hering, of Hinsdale, Ill.; treasurer, C. S. Dodge, of Monroe, Wis.; secretary, I. L. Runyan, of Chicago, Ill.; directors for three years, R. G. Wagner, Jr., of Urbana, Ill., and P. F. Irwin, of Madison, Wis. More than one hundred and fifty members of the association attended, making the convention the largest in years. The next convention also will be held at Lake Delavan.

Retailers Still at Odds with Hoover; May "Tell Public the Truth" Soon

HOMER D. JONES, president of the National Retail Coal Merchants' Association, said in Chicago Saturday that the controversy between Secretary of Commerce Hoover and his association is by no means settled, although the association still stands ready and willing to co-operate with Mr. Hoover if he will only let it. But when Mr. Hoover insists that "pre-strike" coal in dealers' hands be sold to small domestic consumers at pre-strike prices around Chicago he is asking for the impossible, according to Mr. Jones, for there is no more "pre-strike" coal left. The assumption that Chicago retailers suddenly boosted coal prices on stocks has vitally involved Chicago retailers and held them up to public scorn. This must be corrected, Mr. Jones says. Therefore the association is asking Mr. Hoover publicly to correct it.

"We are more than willing," said Mr. Jones, "to comply with Mr. Hoover's requests that retailers sell all coal at cost plus a reasonable charge for handling. We are more than willing to 'co-operate to prevent rising mine prices' and to 'handle coal on straight lines from operator and wholesaler without speculative resales,' but even for those few dealers in the land who have coal on hand which they bought before the strike it would be impracticable to maintain two prices for coal from the same yard, as Mr. Hoover suggests.

"What we insist upon is that operators quit taking advantage of the Hoover scale to boost every price right up to the limit for no reason at all except that such prices have 'government sanction.'"

An official of the Chicago retail association said the retailers of the country are preparing a program of publicity which is aimed to "tell the truth to the public" about the costs of mining coal and about the profits which operators are making right now at the expense of the people. He said the date for launching the campaign has not been set but that unless something arises to forestall the plan, the countrywide campaign will start about July 1.

Federal Council of Churches Asks Harding Aid to End Coal Strike

PRESIDENT Harding was asked on June 19 to take steps to end the coal strike in a joint appeal presented by the Commission on the Church and Social Service of the Federal Council of Churches. This is the first time, as far as is known, that representative organizations of Protestants, Roman Catholics and Jews have taken joint action in an industrial matter. The churches in their appeal asked the President to call a national coal conference, to get the facts of the coal industry through a governmental investigation and not to wait until the suffering women and children of the mining camps has become a national calamity.

The statement expresses gratification that the press as a whole has been usually successful in recording the facts in the strike and concludes with the following paragraph:

"We call upon our government, out of concern for the well-being of the nation as a whole, the health and comfort of the miners, and the preservation of the mining industry, to take immediate steps to bring the disputants together in order to secure a just settlement of the present strike and an organization of the coal industry on the basis of the maximum service to the nation. You, Mr. President, succeeded in bringing the nations together in conference to reduce armaments and the incitements to war. We respectfully urge that a national coal conference and a federal investigation of the coal industry would have far-reaching consequences in promoting domestic tranquillity and abridging the causes of industrial strife."

Eleventh Week of the Coal Strike

EDITORIAL REVIEW

RUMORS of an early settlement of the bituminous-coal strike persisted during the eleventh week of the controversy. These rumors apparently were founded on conversations emanating from eastern Ohio, where certain operators, lukewarm toward the district-settlement policy of other Ohio and the Pittsburgh operators, have encouraged the miners in the belief that within a short time operators representing sufficient tonnage to make it worth while could be assembled for a rump four-state conference. This talk made sufficient headway to encourage some of the minor officials of the union to promise the men resumption of work by July 1.

When this line of speculation became noised about, Illinois and Indiana en masse broadcasted statements to the effect that, however willing they may have been in April and possibly even in May to go into a four-state conference with all the regular bunch, they have now decided that under no circumstances will they do so. To all intents this leaves only one group, eastern and northern Ohio, as yet favorable to interstate negotiations and settlements.

The Northwest is the only section of the country that has begun to show any nervousness over the bituminous-coal situation. With three out of eight months of the Lake season gone and practically no coal moved to the Upper Lake docks, a Lake program of a million tons a week for fifteen to twenty weeks—a feat never before accomplished—begins to look like a necessity, and if the strike is prolonged until late in the summer, an impossibility. Aside from the Lake situation the condition of the country with respect to bituminous coal on July 1 will not be far from what may be described as normal with respect not only to production and distribution for the first half of the year but also as to stocks.

The number of non-union mines in Pennsylvania being started up is increasing, but with so few men that the tonnage has little influence on the country's total so far. One company, however, has succeeded in three weeks in raising its output from 500 tons to 4,000 tons per day. In the Kanawha field, union since 1912, 89 mines, about one-third of the total, have resumed production and in nearly every instance with the former union employees working on the Washington agreement scale of wages.

In Kansas, Missouri and Oklahoma reports from the mining fields show the strike to be "very satisfactory" from the viewpoint of the operators. Miners' local officers, under orders, it is said, from district officials, are seeking to make independent contracts. Operators refuse to make any such deals and are standing firm for conferences only with proper miners' union officials. It is reported also that Kansas state officials have conferred with local authorities in most of the mining regions, to make sure that proper protection is given all miners who resume work in any mines. Governor Henry J. Allen says 2,000 miners are working now and that 12,000 are still on strike.

The administration in Washington last week reiterated its policy of non-interference. Secretary Hoover has been so successful in putting over his program of holding down prices that the market is anything but active in the majority of fields at prices lower than those he considered adequate and satisfactory.

The refusal of the operators in western Kentucky to accept the maximum which Mr. Hoover prescribed is generally held in Washington to be a short-sighted policy. It is pointed out that while the existing temporary situation lasts they will be able to make large profits, but were any large proportion of the opertators to insist on taking every advantage of the emergency, it is believed in Washington that Congress would not be slow to carry into effect Senator Lenroot's suggestion that the government take over and operate enough mines in any particular district to supply the necessary demand at reasonable prices.

The Interstate Commerce Commission has made effective on one day's notice the application of the Louisville & Nashville R.R. to put into effect special rates to St. Louis and nearby points which will tend to attract to that center coal from Alabama and southwestern Virginia and thereby decrease the pressure on the Kentucky fields.

John L. Lewis, president of the United Mine Workers, said in Cincinnati, where he has been attending a meeting of the American Federation of Labor, that he believed the miners and rail men would strike in common, tie up industry and win. He was to meet the rail chiefs Tuesday night to discuss joint action.

The threat of a railroad strike has had no effect on the peace of mind of the coal consumer and therefore has not affected the market.

Anthracite Miners Reject Mediation Plan; Would Negotiate on Basis of Old Scale

REJECTION on June 14 by the representatives of the anthracite mine workers of the proposal of the anthracite operators that the differences between the operators and miners be submitted to arbitration had been anticipated by newspaper dispatches from the coal region. The formal rejection was given to the operators' committee at the Union League Club, New York City, at the first meeting of the joint subcommittee to be held since June 6, when the operators' proposal was submitted.

In rejecting the operators' proposal the representatives of the miners say it would be agreeable to them to join with the operators in arranging for a settlement of "our differences" on condition that the operators accept the request for an eight-hour day for day men, complete union recognition and that existing rates of pay be taken as a starting point for future deliberation.

The statement of the miners, addressed to S. D. Warriner, W. J. Richards, W. L. Connell and William W. Inglis, and signed by John L. Lewis, Philip Murray, Thomas Kennedy, C. J. Golden and W. J. Brennan, follows:

> Your proposal for arbitration, which you made to us in conference on June 2, has been submitted to our general scale committee at a meeting at Hazleton on June 6-7, and has had our most serious and careful consideration.
>
> The proposal which you make provides for the arbitration of our differences by a commission or tribunal to be appointed by the President of the United States. It is stated in general terms and does not specify what the scope of the powers or jurisdiction of such a tribunal or commission should be. We assume, however, that you contemplate the adjustment of rates of pay according to the four standards set forth by you in your counter-proposals to us of May 18.
>
> These standards, as we have previously stated, are unacceptable to us, as they provide only for determining rates of pay according to the changes in factors affecting the demand for or supply of labor. They assume that labor in the anthracite mines is a commodity, the price of which should be determined by the same forces which influence the value of other commodities. The consideration of human standards is precluded, and no safeguards are afforded against the use as precedents before the tribunal or commission which you propose of wage scales fixed by the arbitrary action of employers in industries where collective bargaining is not recognized and where no proper standards of compensation are observed.
>
> In the second place, we note that you make no mention of the three fundamentals which we insist should be accepted by you as a condition to the settlement of our differences. These are: (1) A living or saving wage for the workers in the lowest scale of occupations in the industry, (2) an actual eight-hour day for day men, and (3) complete union recognition. Our attitude is that these are fundamental rights or equities and should be accepted by you as preliminary to any wage adjustment and that they are not arbitrable matters.
>
> In the third place, we note that you do not include within the scope of the jurisdiction of your proposed tribunal or commission any reference to labor costs as compared with other elements of cost and profits within the industry as royalties, freight rates and profits of coal-producing and coal-sales companies. You practically state that the question of a reduction in wages or labor costs should be arbitrated as a possible means of reducing prices of coal to the consumer. You doubtless know that we suggested to you a governmental investigation of the excessive prices of coal to the consumer, and you refused to accept our offer. Therefore, for these and other reasons, we are compelled to decline your proposition. We are in accord with your contention that prices of coal should be reduced, but believe that existing wages can be maintained and prices to consumers of coal be reduced by the lowering of other unnecessary costs and by the elimination of excessive profits in the industry.

In the light of our fundamental attitude, therefore, and with the understanding of your proposal as outlined above, it would be agreeable to us to join with you in arranging for a settlement of our differences on the following conditions:

> First—That you accept our requests for (1) an actual eight-hour day for day men in the industry, and (2) for complete union recognition, and
>
> Second—That existing rates of pay be taken as a starting point for future deliberation. This together with a discussion of the other demands of the Shamokin convention we hope may result in prompt agreement.

Aside from the inequitableness of considering reductions in wages without at the same time considering the effect of other elements of cost and profits affecting prices of coal to consumers, we cannot agree to any basis of settlement which might reduce the earning possibilities of the mine workers, as their earnings under existing rates of pay are sufficient only for a bare standard of subsistence for themselves and their families. They feel that they should be entitled to a savings wage, the necessity for which in general has been so effectively set forth by President Harding and Secretary of Labor Davis in public statements.

On behalf of the anthracite mine workers, we present the foregoing suggestions with the hope that you will give to them your most earnest consideration in the interests of industrial peace.

After the reply of the miners had been presented to the operators the latter went into executive session, which lasted about 45 minutes. Then Mr. Warriner, on behalf of his associates, presented the operators' reply, which was addressed to the miners' representatives and signed by the operators' committee. It was as follows:

It is evident from your reply to our offer of unrestricted arbitration that you are not willing to further negotiate with us, nor to submit the matters in controversy to a tribunal appointed by the President unless the principal question to be considered, namely, wages, is only to be considered by revision upward.

It would have been just as reasonable if, in making our arbitration proposal, we had stipulated that only a downward adjustment of wages should be considered.

You make the further stipulation that to the recognition heretofore accorded your union shall be added the closed shop and check-off.

We cannot agree to the restrictions and limitations you propose.

Our proposal that a tribunal to be appointed by the President should ascertain and consider all the facts and determine the questions covering wages and conditions of employment at issue between us contains no restrictions or qualifications. The power of the tribunal should not be limited by the various reservations you make. Arbitration confined to its scope and limited to action in one direction only, regardless of facts, is no arbitration.

With a full realization of our responsibility to the public and with a sincere desire to secure a settlement of our controversy, we have offered a proposal of arbitration the character and fairness of which cannot be reasonably questioned. We can go no further.

We stand on this offer of arbitration. If you refuse it, and continue the present suspension, or carry out your threat of calling a strike, the responsibility is yours.

When the session of the joint subcommittee adjourned no date was set for the next meeting. It was announced, however, that the status of the negotiations would be made known to the miners and that a meeting of the general scale committee of the union will be held in Wilkes-Barre on June 26.

Illinois and Indiana Positively Will Not Take Part in Four-State Wage Conference

While there has been much mysterious talk in the Middle West about "events about to happen" in the strike situation, nothing more definite has taken place there than an official declaration by both the Indiana and Illinois operators that they positively will not take part in a four-state conference. These statements were drawn forth by the published report that Ohio operators thought a four-state conference was now possible, and by a speech which William Green, secretary of the United Mine Workers, made in Cincinnati to the same effect.

The only other strike events of the week in the Middle West were the opening under machine-gun guard of the Lester & Sherwood strip mine six miles south of Herrin, Ill., and the harassed resumption of mining in a few more small pits in Indiana, as reported in another column. On the 16th the strip mine near Herrin began to load the first coal dug for the market in Illinois since April 1. Crowds gathered to watch the proceeding, but there was no interference with so formidably protected an operation. Most of the workers are reported to be men picked up in and around Chicago. They are housed and fed on the company's property.

The Illinois operators' statement, saying that they would deal only with their own men, follows:

"There is no warrant for the assumption of Ohio operators that Illinois would at this time participate in a joint conference with other states to consider the present mine labor situation: It is well known that from the latter part of 1921 through to the time Illinois mines were shut down by the order of the national organization of the miners, Illinois operators agreed to attend such conferences, but were in every instance denied permission so to do by John L. Lewis, president of the miners' national organization.

"The time has passed when such a joint conference with any other states is desirable, and the Illinois operators now will negotiate only with their own men in Illinois, as they have repeatedly assured Mr. Farrington they were entirely willing to do. The statement of Mr. Green regarding the willingness of the national officers of the miners' union to hold such conference if substantial tonnage might participate is only a repetition of their previous stand, on the basis of which Illinois has already been twice refused."

Indiana Suffers Several Outbreaks; Mine Owner's Wife Defeats "Army"

The western Indiana coal fields are beginning to be shaken by strike outbursts and most of the counties of the Fifth Congressional district are sitting on a veritable volcano which threatens to erupt strife and bloodshed at any moment. Numerous little wagon mines are working, employing whoever wants to make a living. The miners of Vermillion, Vigo, Green, Clay and Sullivan counties are trying to drive these workers away. One hundred and fifty strikers who this week closed up a couple of small mines near Clinton went to another, where they were met by nine heavily armed guards who informed them the mine was running, would continue to run, and no talking was permitted by strikers. The miniature army left, with the threat to return.

Mrs. William Drake, wife of the proprietor of the Drake mine, near Terre Haute, stood more than 100 strikers at bay with a shotgun when the miners attempted to close down the mine. The same day four men were injured in the same district during outbursts between the radical element of the mine workers and mine operators. Some of the mine owners, in view of the recent decision concerning the liability of the mine workers' organization plan to enjoin the union from molesting them further.

Striking miners gathered at the Kern Coal Co. mine on East Hulman street, in Terre Haute, in an effort to force a shutdown. The management refused to close, despite the fact that the union men pushed a large bus across the road in an effort to stop the truckers from getting to the main public highway. The day following the workers reported with shotguns. Leaving the Kern mine the mob went to the Morris & Faulkner mine and demanded that eight men there cease work. It was said that the men refused, whereupon the strikers threatened to upset several loaded wagons. Threats of burning the mine property and acts of violence were said to have been made by the men. The sheriff's office in each county appears powerless to do anything to prevent such occurrences.

Working Forces in Connellsville Region Continue to Increase; Workers Attacked

In the Connellsville coke region the past week has been marked by slight increases in the working forces and outputs at most plants which have been in operation. The H. C. Frick Coke Co. has been able to resume operations at the Continental No. 1 plant and increase 70 per cent at the Leisinring No. 3 plant. The Hillman Coal & Coke Co. has resumed in a small way at the Griffin No. 1 and Tower Hill No. 1 plants in the past week.

The American Coke Corporation has made a start at the Orient and Martin plants. The American Manganese Co. at Dunbar has doubled the output in the past two weeks and is shipping eight to nine cars of coal per day. The Consolidated Coke Co. and the Stewart plant of W. J. Rainey, Inc., have doubled their production in the past two weeks.

On Tuesday night, June 13, a large crowd of striking mine workers congregated on the downtown business streets of Brownsville, expecting some strike breakers to arrive on some of the evening trains. Being disappointed in this, they attacked two men working for the Brier Hill Coke Co. who happened to be on the street, but who were rescued by the local police and the Brier Hill foreman before they were injured. Later in the evening they attacked an assistant mine foreman from Alicia No. 1 coke plant of the Pittsburgh Steel Co. (which plant is working).

Violence Recurs in Scott's Run Field; Augment State Police and Sheriff's Force

SINCE a number of companies succeeded in getting back to an operating basis in the Scott's Run field of Monongalia County, West Virginia, there has been more or less violence in that field, reaching its climax about the middle of June, when it became necessary to increase the size of the detachment of state police on duty in Monongalia and also to augment the size of the sheriff's force in order to safeguard lives and properties. Despite the frequent demonstrations, marches and other overt acts, miners continue to work and production continues about on the same level. It has been necessary, however, for Judge Lazelle and the Prosecuting Attorney of Monongalia County to forbid further assemblages on the public thoroughfares and on private property.

Utah Troops Round Up Strikers After Much Outlawry; Mine Manager Shot

GOVERNOR MABEY of Utah has issued a proclamation declaring martial law in Carbon County following the shooting up of a train near Castlegate, the killing of a deputy sheriff acting as a mine guard and the wounding of General Manager Lewis, of the Standard Coal Co., and others. Members of the national guard are now in control and are rounding up the strikers and disarming them.

Major Johnson, in command, has been given absolute authority to take all necessary steps to end the lawlessness in the strike area and there has been some talk of closing the mines. Machine guns have been placed on the hillsides. Many arrests have been made. So far the strikers have submitted quietly to the rule of the new authority and some of them even good naturedly.

Somerset County Court Inflicts Fines For Violation of Injunction

TWENTY-NINE men and ten women were adjudged guilty of contempt in the Somerset County (Pa.) Court on June 13, being held for violating an injunction restraining union miners from interference with the operations of the Consolidated Coal Co. plants. Among those adjudged guilty were George Wagner, president; John Uhrin, vice president, and Tom Austovich, treasurer, of the Biesecker local of the United Mine Workers. The officers were fined $100 each and their share of the costs and paroled in the custody of Sheriff J. W. Griffith for six months. The other men were fined $100 each, $25 to be paid within ten days, and paroled for six months. The women were fined $75 each, and costs, and paroled for six months.

Operators of Belmont County, Ohio, Ask Injunction Against Intimidation

INJUNCTION proceedings against miners in Belmont County, Ohio, who are trying, it is asserted, to intimidate employees of the Katherine Coal Stripping Co., have been filed in the U. S. Court at Columbus. The petition is similar in every respect to that filed several weeks ago by a number of stripping operators in Jefferson County, including the Harmon Creek Coal Co., the Penova Coal Co., the Tasca Coal Co., the Wayne Coal Co. and the United Coal Mines, Inc. The former suit has been heard by the court and Judge Sater has granted a temporary injunction to prevent union miners from interfering with the employees of the plaintiff companies.

Railroad Labor Board Cuts Pay of Clerks, Signalmen and Stationary Firemen

ON Friday, June 16, the Railroad Labor Board announced another wage reduction order, cutting about $27,000,000 a year from the wages of clerks, signalmen and stationary firemen, reductions being from 2c. to 6c. an hour. About 325,000 employees are affected, and this reduction brings the total ordered by the board, effective July 1, to $135,000,000 a year, affecting in all 1,200,000 employees.

The board says that while it must not be assumed that the employees must bear the cost of railway rehabilitation, "patriotic common sense" demands that every citizen, including railway employees, should co-operate in getting the carriers back on their feet. This decision passes upon two subjects which have been persistently injected into coal-wage discussions for the last two years—the "living wage" or "saving wage" and the "family budget."

On the first the board said that as soon as post-war conditions, which now obscure matters, are cleared up, it will give consideration to details incident to the scientific adjustment of wages on the "living" or "saving" basis.

The board said it had given careful consideration to the employees' testimony with respect to "budgets" but that the matter submitted on this and on standards of living was "highly theoretical and of but little value."

"When the railway employees' department presented figures to show that the sum of $2,636.97 is necessary for the minimum comfort budget of the average family," said the decision, "it propounded an economic impossibility."

Jersey Central Files Answer in Reading Segregation Suit

IN THE federal court at Philadelphia the Central Railroad Company of New Jersey made answer Wednesday, June 14, to the petition of Isaac T. Starr and Mary T. W. Starr to intervene in the Reading segregation case on their objection to the sale of the controlling interest in the Lehigh & Wilkes-Barre Coal Co. to the Reynolds syndicate.

The answer says that the Reynolds bid amounted to $32,291,130, with a cash payment of $11,036,220, while the Franklin Securities Co. bid was $32,278,184, with an initial cash payment of $6,384,029. It is contended that there were indefinite features about the Franklin bid, which were subject to negotiation and adjustment, and that it was contingent upon there being no legal obstacle to transferring the stock to the Lehigh Coal & Navigation Co.

It is said there is no evidence to support the contention that Mr. Reynolds was favored in the matter of information about the coal company and that the question whether the members of the Reynolds syndicate are qualified to hold the coal-company stock is a matter for the Department of Justice to determine and does not concern Jersey Central stockholders.

I. C. C. Approves Ford Cut in Coal Rates

REDUCTIONS in freight rates on coal proposed by Henry Ford on his railroad, the Detroit, Toledo & Ironton, which originally were suspended by the Interstate Commerce Commission, were sanctioned June 14 under a final decision of the commission. They become effective July 1 and reduce rates on coal from southern Ohio points approximately 10c. a ton.

The commission, upon the protest of competing mine operators on other railroads, had ordered the schedules held up to await investigation.

The regulating board found that the Ford railroad, instead of proposing to scrap a scheme of carefully adjusted rates on coal from the mines in Pennsylvania, Ohio, West Virginia, Kentucky and Tennessee, was intending to restore an adjustment revoked by the Detroit, Toledo & Ironton before Ford acquired control of it. The commission said Ford had done right when he removed the mines on his road from the Ironton to the Jackson district.

Production and the Market

Weekly Review

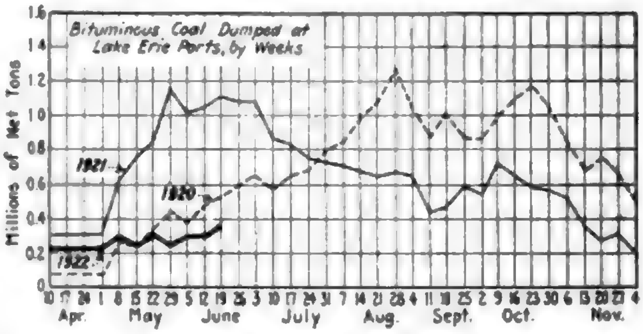
CONSUMERS are not worrying about their fuel supply. A softer market has been brought about by this complacent attitude, which has been induced largely by such factors as the rumors of attempts to settle the strike, the withdrawal of any but emergency fuel orders until the freight-rate reductions become effective, July 1, and the approach of the usual midsummer lethargy of industry, which is already making itself felt in some lines. There is almost an entire lack of interest in the railroad strike threat. So far this has produced no additional business and but very few inquiries for early deliveries.

Not the least potent of these influences on the market is the belief that Secretary Hoover's price list is a bulwark against prohibitive prices. Spot coal values have not reached these figures since they were announced on June 1, and have receded further in the last week. *Coal Age* Index of spot bituminous prices stands at 274 on June 19, as compared with 284 on June 12; this represents an average mine price of $3.31 per ton, a drop of 13c. from the figure for the preceding week.

DIVERSE CONDITIONS SHOWN IN VARIOUS MARKETS

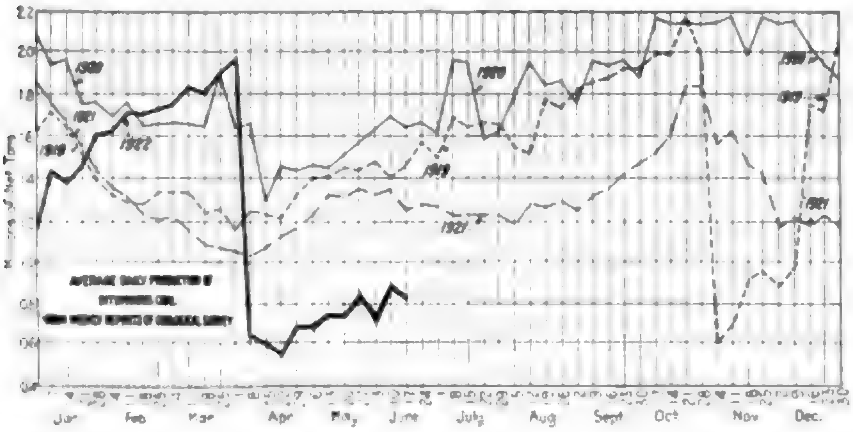
Connellsville coal, which is not included in Hoover's price list, advanced during the past week, due to an active steel demand. The market is comparatively strong from Connellsville east, with the exception of New England, which is still being amply supplied by Southern coals from Hampton Roads. West of Pittsburgh the only active market is in the Northwest. The Head-of-the-Lakes docks had only 2,375,000 tons on hand June 1, of which about one-third is free coal. Demand from railroads and other large users has absorbed about all of this open tonnage that the docks will spare. Some docks have no surplus and many others are holding coal for old customers. Receipts by Lake have been so light this season that strenuous shipping efforts must now be made to avert a fuel shortage in the Northwest this winter.

The Chicago and Midwestern territories again present an unattractive market for coal. As in other sections, there is a tendency to await cheaper transportation costs after July 1. Large consumers generally have fair reserves to tide them over the balance of June and many are taking coal on short-term agreements. This has removed so much of the spot demand that, despite the efforts of operators, prices have slumped and some jobbers have again unloaded at a loss. Western Kentucky coal, unhampered by any price edict from Washington, was selling around $4.15 ten days ago. Early this week $3.65 and even lower had been recorded. Alabama tonnage is now entering Illinois fuel markets, and this is a factor in breaking prices. The congestion of unsold cars of both eastern and western Kentucky coal has been so great that mines on the L. & N. have been refused a full car supply until the accumulation has been moved.



Tidewater prices have softened but little. The flow of coals to Hampton Roads has been cut down, however, and much of it has been diverted through Cincinnati to inland markets. This has softened prices on both high and low volatile.

Despite the strike this year production of bituminous coal up to the end of the first week in June was equal to the output in the corresponding period of 1921. At



Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1922	1921
May 27	4,889,000	8,166,000
June 3 (b)	4,616,000	6,835,000
June 10 (a)	5,078,000	8,010,000
Daily average	846,000	1,335,000
Calendar year	172,192,000	173,551,000
Daily. av. cal. yr.	1,261,000	1,280,000

ANTHRACITE

May 27	9,000	1,988,000
June 3	8,000	1,573,000
June 10 (a)	13,000	1,963,000

COKE

June 3	97,000	61,000
June 10 (a)	98,000	58,000
Calendar year	2,885,000	3,249,000

(a) Subject to revision. (b) Revised from last report.

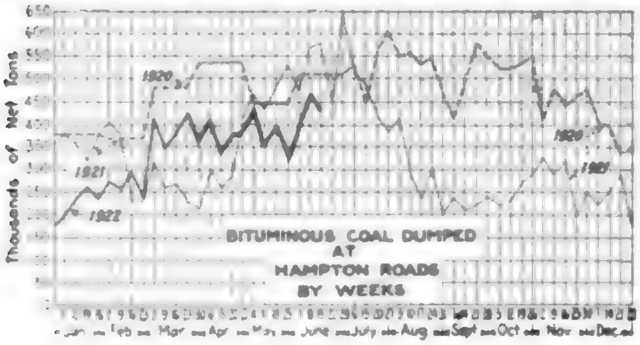
the beginning of this year stocks were practically identical with those of Jan. 1, 1921. It is estimated, however, that stocks are now around 10,000,000 tons less than at this time last year.

The anthracite situation seems to be deadlocked and probably can be broken only by the President calling a conference of producers and miners. In the meantime the output is confined to a small steam tonnage dredged from the rivers.

BITUMINOUS

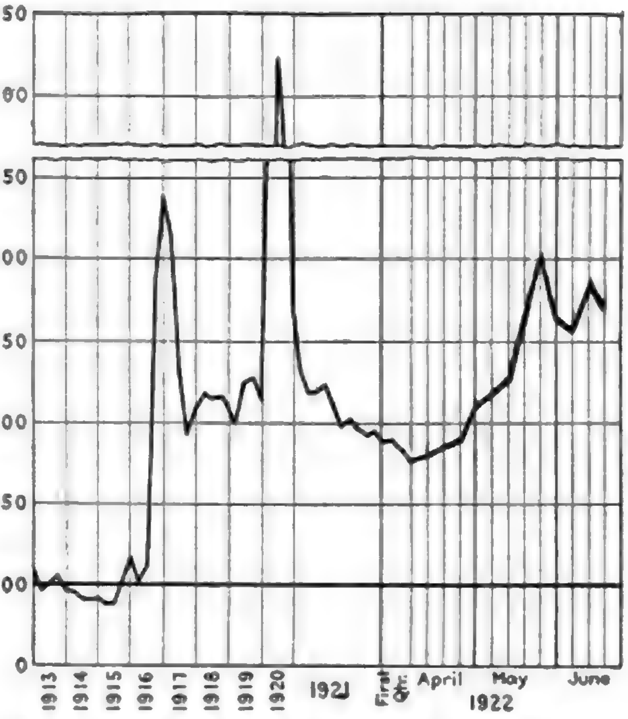
"Production of soft coal in the tenth week of the strike was 5,078,000 net tons, but the eleventh week (June 12-17) is expected to show a decrease," says the Geological Survey.

"Complete returns confirm the forecast of output in the tenth week of the strike. Including the 13,000 tons of anthracite dredged from the rivers, the total output of all coal was 5,091,000 tons. In the corresponding week of 1921, a year of acute business depression, production (including anthracite) was 9,974,000 tons. In the active year, 1920, it was 12,315,000 tons. If anthracite and bituminous coal be regarded as a common supply of fuel, it will be seen that the coal now being raised weekly is from 5 to 7 million tons below normal.



DAILY LOADINGS DURING STRIKE

	First Week	Sixth Week	Seventh Week	Eighth Week	Ninth Week	Tenth Week	Eleventh Week
Monday	11,445	13,118	13,366	14,772	15,058	14,597	15,590
Tuesday	11,019	13,266	12,830	15,085	11,056	15,269	15,735
Wednesday	11,437	13,445	13,422	14,677	15,222	15,999	14,947
Thursday	11,090	13,266	13,445	14,573	13,790	16,325	15,023
Friday	11,296	13,727	14,036	15,202	14,523	15,864	......
Saturday	8,888	11,454	12,357	12,662	12,545	13,991	......



Coal Age Index 274, Week of June 19, 1922. Average spot price for same period $3.31. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh District, Illinois and Indiana prices not included in figures for last week.)

"The eleventh week started out well, but on Wednesday serious congestion of railroad yards and sidings in certain districts of southeastern Kentucky began to interfere with the placement of empty cars at the mines. As a consequence loadings on Wednesday and Thursday were about a thousand cars below those of last week. It is therefore unlikely that the total output for the eleventh week will do more than reach the 5,000,000-ton mark."

All-rail movement to New England during the week ended June 10 declined slightly to 520 cars from 565 cars in the week preceding. This territory presents a limited market for Pennsylvania coals, owing to the competitive

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	May 22, 1922	June 5, 1922	June 12, 1922	June 19, 1922†
Smokeless lump	Columbus	$3 65	$3 35	$3 75	*$3 00@$3 60*
Smokeless mine run	Columbus	3 30	3 00	3 50	*3 25@3 50*
Smokeless screenings	Columbus	3 25	2 85	3 20	*3 00@3 35*
Smokeless lump	Chicago	2 75	3 10	3 65	*3 35*
Smokeless mine run	Chicago	2 75	2 85	3 40	*3 00@3 25*
Smokeless lump	Cincinnati	3 50	3 40	3 65	*3 00@3 25*
Smokeless mine run	Cincinnati	3 25	2 85	3 40	*3 25@3 50*
Smokeless screenings	Cincinnati	3 15	2 75	3 00	**3 00@3 25**
*Smokeless mine run	Boston	7 35	6 05	6 65	*6 00@6 25*
Clearfield mine run	Boston	3 75	3 20	3 25	*2 75@3 25*
Cambria mine run	Boston	4 25	3 65	3 75	*3 25@3 [illegible]*
Somerset mine run	Boston	3 65	3 15	3 25	*3 00@3 50*
Pool 1 (Navy Standard)	New York		4 40	......	4 25@4 50
Pool 1 (Navy Standard)	Philadelphia	4 75	......	......	......
Pool 1 (Navy Standard)	Baltimore	......			3 75@4 25
Pool 9 (Super Low Vol.)	New York		3 90	4 00	**3 90@4 15**
Pool 9 (Super Low Vol.)	Philadelphia	4 65	3 90	4 05	**4 00@4 60**
Pool 9 (Super Low Vol.)	Baltimore	4 75	3 40	4 25	*3 75@4 00*
Pool 10 (H Gr Low Vol.)	New York	4 90	3 75	4 00	*3 75@4 00*
Pool 10 (H Gr Low Vol.)	Philadelphia	4 75	3 70	3 75	**3 75@4 25**
Pool 10 (H Gr Low Vol.)	Baltimore	4 75	3 35	3 75	**3 75@4 00**
Pool 11 (Low Vol.)	New York	4 65	3 60	4 00	*3 50@3 75*
Pool 11 (Low Vol.)	Philadelphia		3 25	3 50	**3 80@4 00**
Pool 11 (Low Vol.)	Baltimore	4 75	3 15	3 75	*3 50*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York		3 65	4 00	*3 50@3 85*
Pool 54-64 (Gas and St.)	Philadelphia	3 40			......
Pool 54-64 (Gas and St.)	Baltimore	4 00	3 25	3 80	*3 50*
Kanawha lump	Columbus	3 60	3 15	3 65	*3 25@3 50*
Kanawha mine run	Columbus	3 25	2 85	3 40	*3 15@3 35*
Kanawha screenings	Columbus	3 35	2 65	3 15	**3 15@3 35**
W. Va. Splint lump	Cincinnati	3 40	3 25	3 50	*3 25@3 50*
W. Va. Gas lump	Cincinnati	3 65	3 25	3 50	*3 25@3 50*

	Market Quoted	May 22, 1922	June 5, 1922	June 12, 1922	June 19† 1922
W. Va. mine run	Cincinnati	$3 40	$2 75	$3 25	*$2 65@$3 15*
W. Va. screenings	Cincinnati	3 25	2 60	3 15	*2 65@3 00*
Hocking lump	Columbus	3 90	3 10	3 65	*3 25@3 50*
Hocking mine run	Columbus	3 65	3 00	3 40	*3 00@3 25*
Hocking screenings	Columbus	3 50	2 85	3 15	3 00@3 25
Pitts. No. 8 lump	Cleveland	3 90	......	4 00	4 00
Pitts. No. 8 mine run	Cleveland	3 90		3 70	3 60@3 75
Pitts. No. 8 screenings	Cleveland	3 90		3 70	3 60@3 75
Midwest					
West Ky. lump	Louisville	3 25	3 30	3 75	**3 75@3 90**
West Ky. mine run	Louisville	3 25	3 30	3 75	**3 65@3 90**
West Ky. screenings	Louisville	3 25	3 30	3 75	**3 65@3 90**
West Ky. lump	Chicago	3 60	3 40	4 15	*3 65@3 90*
West Ky. mine run	Chicago	3 60	3 40	3 95	*3 65@3 90*
South and Southwest					
Big Seam lump	Birmingham	2 00	2 20	2 20	2 15@2 25
Big Seam mine run	Birmingham	1 70	1 70	1 85	1 75@2 00
Big Seam (washed)	Birmingham	1 85	1 85	1 85	1 75@2 00
S. E. Ky. lump	Chicago	3 65	3 10	3 75	*3 50*
S. E. Ky. mine run	Chicago	3 50	3 10	3 50	*3 25*
S. E. Ky. lump	Louisville	3 90	2 85	3 75	3 75
S. E. Ky. mine run	Louisville	3 40	2 85	3 50	*3 00@3 50*
S. E. Ky. screenings	Louisville	3 40	2 85	3 25	*3 00@3 25*
S. E. Ky. lump	Cincinnati	3 50	3 25	3 50	3 40@3 60
S. E. Ky. mine run	Cincinnati	3 50	2 80	3 40	*3 00@3 15*
S. E. Ky. screenings	Cincinnati	3 25	2 75	3 15	*2 75@3 00*
Kansas lump	Kansas City	4 25	4 25	5 00	5 00
Kansas mine run	Kansas City	4 15	4 20	4 25	4 00@4 50
Kansas screenings	Kansas City	2 65	2 75	2 85	**2 85@3 00**

*Gross tons, f. o. b. vessel, Hampton Roads.

†Advances over previous week shown in **heavy type**, declines in *italics*.

NOTE—Smokeless prices now include New River and Pocahontas.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. to Apr. 1, 1922 inclusive	April 8 to June 3, 1922 inclusive	Week Ended June 3
U. S. total	45.6	55.7	....	....
Non-Union				
Alabama	63.5	64.6	75.1	88.6
Somerset County	55.5	74.9	45.6	26.0
Panhandle, W. Va.	55.3	51.3	39.9	45.7
Westmoreland	54.9	58.8	78.6	77.1
Virginia	54.8	59.9	77.4	84.5
Harlan	53.3	54.8	53.5	68.9
Hazard	51.7	58.4	60.9	72.9
Pocahontas	49.8	60.0	75.3	78.5
Tug River	48.1	63.7	81.2	83.8
Logan	47.6	61.1	76.1	79.0
Cumberland-Piedmont	46.6	50.6	15.1	18.6
Winding Gulf	45.7	64.3	70.8	74.9
Kenova-Thacker	38.2	54.3	78.5	82.8
N. E. Kentucky	32.9	47.7	60.5	67.0
New River‡	24.3	37.9	17.1	35.6
Union				
Oklahoma	63.9	59.6	14.3	13.0
Iowa	57.4	78.4	0.0	0.0
Ohio, Eastern	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	0.7	2.5
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	11.6	15.0
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	11.5	12.7
Fairmont	35.3	44.0	4.7	4.8
Western Kentucky	32.5	37.7	55.5	68.6
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	3.2	10.1
Ohio, southern	22.9	24.3	0.0	0.0

* Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

position of the Southern fuels and shipments are mostly on railroad contracts.

Hampton Roads dumpings were 436,736 net tons during the week ended June 15, as compared with 472,300 tons in the previous week. Accumulations at the piers have declined but the approach of the freight cut on July 1 has made a quieter market. Marine freights show a firmer tendency with the talk of a railroad strike.

Lake dumpings during the week ended June 19 were 388,661 net tons—378,181 tons cargo and 10,480 tons vessel fuel—as compared with 293,110 tons in the preceding week. For the Lake season to date 3,039,413 tons have been dumped, as compared with 8,019,733 tons in the corresponding period last year. Much of this tonnage has been going to new destinations on Lake Erie. This has further reduced the abnormally small movement up the Lakes.

ANTHRACITE

Production of hard coal remains practically at a standstill, being confined during the week ended June 10 to 253 cars of steam coal dredged from the rivers. Consumers are gradually showing more interest in the situation. Some orders for winter coal are being placed but the retailers are mostly taking these as applications for coal when it is again available and are safeguarding their present meager stocks wherever possible. Steam coal in mine storage is practically cleaned up or on order and this has improved the demand for river coals.

COKE

Production of beehive coke was 98,000 tons during the week ended June 10, a gain of 1,000 tons as compared with the previous week. Coke offerings are very light and the price range is firm at last week's quotations.

Production of byproduct coke increased sharply during May. One reason for the increase was the smaller supply of beehive coke resulting from the strike in the Connellsville region. Against a total of 732,000 tons of beehive coke in March, the May output was only 432,000 tons.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES a
(Net Tons)

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,638,000	3,733,000
1920 Monthly average	2,565,000	1,748,000	4,313,000
1921 Monthly average	1,660,000	463,000	2,123,000
February, 1922	1,795,000	549,000	2,344,000
March, 1922	2,137,000	732,000	2,869,000
April, 1922	2,208,000	528,000	2,736,000
May, 1922	2,537,000	432,000	2,969,000

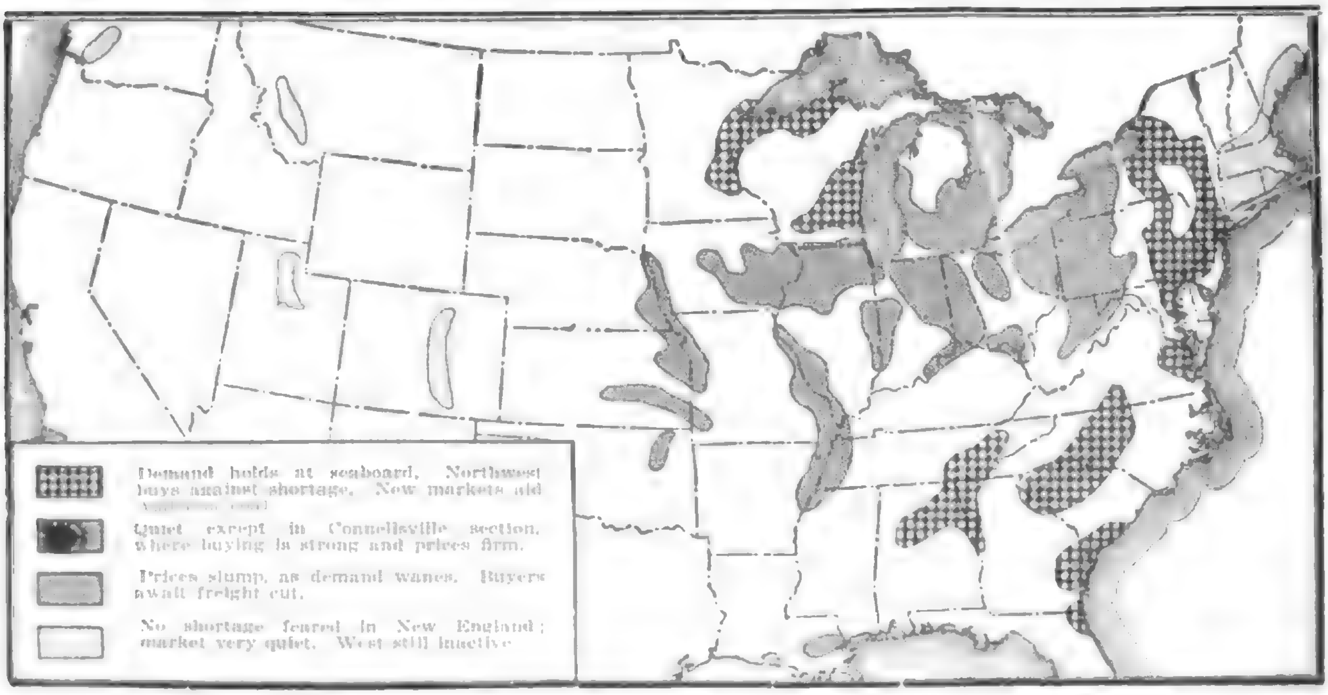
(a) Excludes screening and breeze.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE
(Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly averag	2,625,000	4,354,000	6,979,000
1918 Monthly average	3,072,000	4,014,000	7,086,000
1919 Monthly average	2,988,000	2,478,000	5,466,000
1920 Monthly average	3,684,000	2,665,000	6,349,000
1921 Monthly average	2,385,000 (a)	731,000 (a)	3,116,000
March, 1922	3,071,000 (a)	1,155,000 (a)	4,226,000
April, 1922	3,172,000 (a)	833,000 (a)	4,005,000
May, 1922	3,645,000 (a)	681,000 (a)	4,326,000 (a)

(a) Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in by-product ovens, and 63.4 per cent in beehive ovens.

Relative Activity of Markets for Bituminous Coal at End of Eleventh Week of Strike


▨ Demand holds at seaboard. Northwest buys against shortage. New markets aid [illegible]
■ Quiet except in Connellsville section, where buying is strong and prices firm.
▒ Prices slump, as demand wanes. Buyers await freight cut.
☐ No shortage feared in New England; market very quiet. West still inactive

Foreign Market And Export News

British Output Nears Low Point of Year; Sales Pushed to Prevent Congestion

PRODUCTION in the United Kingdom for the week ended June 3 was 4,441,000 gross tons, as compared with 4,630,000 tons for the previous week, according to a cable to *Coal Age*.

Business is more active than last week. The trade is making concessions to buyers for immediate deliveries in order to clear heavy supplies and prevent congestion. Some cargoes are being booked for Canada. The Argentine Department of Navigation is inquiring for 25,000 tons, to be spread over five months.

The Miners' Federation has met in London to consider the wages position. After the deliberations, the secretary said that it was ascertained that every district in the Federation, with the exception of one, is now down to the minimum of wages, and that this, combined with the irregularity of employment, is resulting in hardships to the men. So low are the wages and so bad the situation that in his opinion the British famine has begun. Owing to the breach in the continuity of payment of the unemployment benefit in areas where unemployment is continuous, great hardships are being experienced. It has also been decided to interview the Minister of Labor for the purpose of securing the reversal of the decision refusing to concede unemployment benefit to workmen where they had declined to accept wages from the employers at certain collieries below the district rate provided in the agreement.

The Miners' Wages Board for the Eastern area meeting at Derby fixed the percentage addition to basis wages for June at 64.43 as against 79.71 for May. Only one larger reduction has taken place since the present arrangement came into force last July. The actual loss to workers will range from 9d. to 1s. 3d. per shift.

French Mines Increase Output

Production of coal in France during March was 2,764,304 tons as compared with 2,434,506 tons in February, according to the *Colliery Guardian*. These figures are exclusive of the Sarre, which in March raised 1,042,866 tons, sales amounting to 851,342 tons. In April the Sarre production amounted to 798,673 tons, and sales to 667,935 tons.

FRENCH COAL STATISTICS
First Quarter 1922

	— Coal and Lignite — Mar. Tons	Jan.-Mar. Tons
Production	2,764,304	7,935,192
Imports	2,081,268	5,909,755
Exports	75,055	244,552
Consumption	4,770,517	13,600,395

	——Coke*—— Mar. Tons	Jan.-Mar. Tons
Production	82,207	220,997
Imports	432,501	1,053,093
Exports	50,033	144,354
Consumption	464,675	1,129,736

	——Briquets†—— Mar. Tons	Jan.-Mar. Tons
Production	198,767	680,566
Imports	95,260	452,386
Exports	11,259	34,066
Consumption	282,768	1,098,886

*Not including coke produced at metallurgical works.

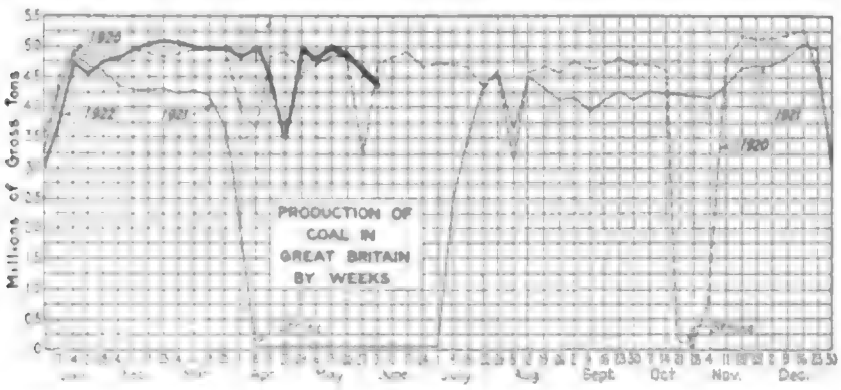
†Not including briquets produced at independent works.

In March 1,219,561 tons were imported from Great Britain, 320,440 tons from the Sarre, 298,184 tons from Germany, 161,618 tons from Belgium, and 90,432 tons from Holland. Imports in the first quarter were as follows: Great Britain, 3,231,898 tons; Germany, 974,280 tons; Sarre, 823,727 tons; Belgium, 666,833 tons; Holland, 206,490 tons; United States, 6,340 tons. In March 370,917 tons of coke were imported from Germany, raising the total for the three months to 936,042 tons.

Hampton Roads Market Awaits July 1

Business was fair last week but dumpings showed a decrease from the previous week. Demand was not as strong as formerly, dealers attributing this condition to the agitation in Congress for more general operation of mines, which is expected here to bring down prices somewhat. Another factor is the impending reduction of freight rates July 1.

Export business was extremely slack, with shipments coastwise to the North holding their own. General shipping was on the increase, bringing up the demand for bunkers.



Coal Paragraphs from Foreign Lands

ITALY — Cardiff steam first is now quoted at 38s. 3d., according to a cable to *Coal Age*. Last week's quotation was 38s.

BELGIUM — The crisis in industrial coals persists and the piling up of stocks continues, especially in the Borinage district. Domestic kinds and anthracites still find a steady market, thanks to foreign demand.

SPAIN—The freight rate for coal from the Asturias to Barcelona is now 15 to 16 pesetas.

Hampton Roads Pier Situation

	—Week Ended— June 8	June 15
N. & W. Piers, Lambert's Point:		
Cars on hand	3,365	3,050
Tons on hand	179,235	161,531
Tons dumped	215,567	190,382
Tonnage waiting	20,000	30,000
Virginia Ry. Piers, Sewalls Point:		
Cars on hand	1,588	1,839
Tons on hand	79,400	91,950
Tons dumped	120,957	96,258
Tonnage waiting	12,326	15,000
C. & O. Piers, Newport News:		
Cars on hand	2,274	1,412
Tons on hand	113,700	87,500
Tons dumped	85,173	103,303
Tonnage waiting	3,635	7,500

Export Clearances, Week Ended June 15, 1922

FROM HAMPTON ROADS:

	Tons
For Brazil:	
Ital. S.S. Etna, for Buenos Aires	6,427
For Chile:	
Am. S.S. Orcus, for Talcahuano	5,487
For Colombia:	
Am. S.S. Levisa, for Santa Marta	2,406
For Cuba:	
Nor. S.S. Sagoland, for Sagua de Tanamo	618

Pier and Bunker Prices, Gross Tons

	June 10	June 17†
PIERS		
Pool 9, New York	$7 50@$8 00	
Pool 10, New York	7 50@ 7 80	*$7 50@ $7 75*
Pool 9, Philadelphia	7 00@ 7 50	**7 35@ 8 00**
Pool 10, Philadelphia	6 60@ 7 15	**7 00@ 7.25**
Pool 71, Philadelphia	7 50	**8 25**
Pool 1, Hamp. Rds	6 25@ 6 65	*6.25@ 6 40*
Pools 5-6-7 Hamp. Rds.	6 25@ 6.50	6.25@ 6.50
Pool 2, Hamp. Rds	6 50	6.50
BUNKERS		
Pool 9, New York	$7 80@ $8 30	
Pool 10, New York	7 80@ 8 10	*$7 50@ $7 80*
Pool 9, Philadelphia	7.25@ 7 60	**7 60@ 8 25**
Pool 10, Philadelphia	6 85@ 7 20	**7 50@ 8 00**
Pool 1, Hamp. Rds	6.25@ 6 60	*6.25@ 6.50*
Pool 2, Hamp. Rds	6 25@ 6 50	6 25@ 6 50
Welsh, Gibraltar	43s. f.o.b.	43s. f.o.b.
Welsh, Rio de Janeiro	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Welsh, Lisbon	43s. f.o.b.	43s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	43s. f.i.b.	*42s. f.i.b.*
Welsh, Messina	41s. f.o.b.	41s. f.o.b.
Welsh, Algiers	41s. f.o.b.	*38s. 6d. f.o.b.*
Welsh, Pernambuco	65s. f.o.b.	65s. f.o.b.
Welsh, Bahia	65s. f.o.b.	65s. f.o.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Malta	44s. 6d. f.o.b.	44s. 6d. f.o.b.
Welsh, Las Palmas	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	57s. 6d. f.o.b.	*55s. f.o.b.*
Port Said	51s. 6d. f.o.b.	*49s. f.o.b.*
Alexandria	43s.	43s.
Capetown	35s. 3d.	35s. 3d.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	June 10	June 17†
Admiralty, Large	26s. 9d. to 27s.	*26s. 6d. to 26s. 9d.*
Steam, Smalls	18s. 6d. to 19s.	*18s. to 18s. 6d.*
Newcastle:		
Best Steams	24s.	*23s. 6d. to 24s.*
Best Gas	22s. 6d.	*21s. 6d.*
Best Bunkers	20s. to 21s.	20s. to 21s.

†Advances over previous week shown in **heavy type**; declines in *italics*.

North Atlantic

Buying of Bare Needs Holds Prices Fairly Steady

Purchasers Hold Off as Much as Possible Till Freight Cut Becomes Effective —New York Receives Large Volume of Southern Coal on Orders.

THIS market has quieted still further. As July 1 approaches buyers are taking the barest needs until they can obtain the benefit of reduced freights at that time. There is enough of this demand, however, to maintain prices fairly well and in the case of some quality coals prices have even been advanced.

New York presents the easiest market. There are more cars at the piers than last week and Southern coals are arriving in heavy volume. Very little of this fuel is coming in "on spec," most of it being on orders of large consumers. The threatened rail strike presents an opportunity for greater marine activity and boat freights are developing signs of strength.

NEW YORK

Quotations fluctuated last week and toward the end of the week were somewhat lower. With about 2,000 cars at the local piers and reports showing heavier production, quotations had to be shaded if shippers wanted to induce buying.

Buyers were looking for bargains if they wanted coal. Then there is an impression that prices are going much lower when the new freight rates become effective.

Reports that many textile mills in New England have reopened or are about to do so are gratifying to many local houses, as it will give them an opportunity to place some of their coals.

The gas, electric and transportation companies are receiving large tonnages of Southern coals. Free coals brought here from Southern ports are being quoted $8@$8.25, with lower quotations being heard occasionally.

Early in the week stray lots of Clearfield wagon-mine coal was being quoted around $3.90. Other quotations included B. R. & P. coals around $4; Bessemer the same figure and ¾-in. gas around $4.75.

The railroads were reported as buying heavily, although there were reports that they had stopped buying for the time being.

CENTRAL PENNSYLVANIA

During the last week there were 3,449 cars loaded as against 2,723 cars in the week previous, while the first eleven days of June showed a production of 4,970 cars as against 3,824 cars in the corresponding period of May. The increase was largely brought about by larger forces in the mines in operation, but few operations being opened.

Reports from where the miners have been idle since April 1 show much privation. This is causing great dissatisfaction with the union leaders because of their failure to negotiate a settlement. The feeling is growing that the miners will not tolerate this condition long but will make the best adjustment they can.

PHILADELPHIA

There has been some stiffening of prices recently, although production has been increased. Inquiries have increased very much and the consumer seems to be more interested than for some time.

The buying public has taken it for granted that the Hoover list included Pennsylvania coals and this is no doubt the reason for the considerable increase in inquiries. However, these coals are still selling at the market.

The dealings in coal of the best grades have been extremely light, due mostly to the fact that the bulk of this production is being placed on contracts. The bulk of sales continues to be on Pools 10 and 11. There is also fair offering of unclassified coal.

Southern coal is coming into this market via Tide, but it is mostly deliveries on sales closed a long time since. New business of this kind is scarce, and buyers will at least hold off until July 1. There continues to be a plentiful supply of bunker coal, a good deal of which is accumulating demurrage, as shippers sent in supplies heavily some weeks ago in anticipation of a strong demand. The export trade remains very quiet.

FAIRMONT

Non-union production has become an important factor and the success attending the efforts of mines to operate as such makes it doubtful if there will be a return to a union basis. During the week ended June 10, there were 155 mines or more than one-third of the entire number in operation. During the same period there was an output of more than 120,000 tons.

BALTIMORE

There is no insistent demand, except in individual cases. There are some buyers in the mining regions who are entirely willing to take coal at any reasonable price and these purchasers, along with the curtailment of production, are holding the general market at rates considerably above the prices desired by Secretary Hoover. There has been a sharp decrease in the number of representatives of large consumers who were recently in the regions to secure tonnage. While some consumers are now apparently buying to cover in event of a rail strike, the vast majority do not seem to be at all concerned about the possibilities of a transportation tie-up.

Prices are not as high as they were some ten days ago. There is a strong feeling in the trade that the coals offering at Hampton Roads on the Hoover maximum are due for a jump. This is based on the theory that a decision of the Shipping Board to buy bunker supplies at Hampton Roads will cause a rising market. The Shipping Board has ordered its vessels, even those calling at New York to bunker at the Roads, to take advantage of that low market. Some of this coal will be bought in the open market.

UPPER POTOMAC

Although one or two mines have been shut down through the efforts of the United Mine Workers, other mines have resumed operations on a small scale and there is much activity on the Elk Garden branch of the Western Maryland. Despite assaults on miners, a few Georges Creek producers are still operating, having secured temporary restraining court orders. There is a stiff demand and most producers are adhering closely to the price agreed upon at Washington.

South

BIRMINGHAM

A goodly number of orders have been booked to be shipped into Western territory and also to competitive points in Georgia and Mississippi. Some tonnage is reported to have been shipped to Chicago and Pittsburgh. There is considerable inquiry from Western points and the demand from local territory is also somewhat better than it has been.

The Illinois Central bought from 500 to 750 cars to be shipped from Walker County mines and from operations on the Central of Georgia. Bunker business is very quiet.

Domestic coal is being taken fairly well on contracts and practically all Cahaba field mines have disposed of output for thirty to sixty days ahead. The lower grades are hard to move. Steam prices have changed very little, some slight increases being shown, as noted in the following:

	Mine Run	Washed
Black Creek	$2.00@$2.50	$2.25@$2.50
Cahaba	2.00@ 2.50	2.00@ 2.50
Big Seam	1.75@ 2.00	1.75@ 2.00
Carbon Hill	2.00@ 2.25	2.00@ 2.25
Corona	2.00@ 2.25	2.25@ 2.50
Pratt	1.75@ 2.25	1.90@ 2.25

There is a pretty heavy movement of coal in the district, furnace companies mining increasing quantities as additional stacks are being blown in to meet the active iron market. Local railroads are pretty well stocked up and as a rule are taking minimum amount of contracts, with the possible exception of the Frisco. Production is on a basis of approximately 320,000 net tons per week. Car supply is better, but labor shortage is being felt in some sections.

VIRGINIA

Car and labor shortage losses have cut down the production, but the output is still above 84 per cent. Car shortage losses are heavy on the Interstate and the Southern. "No market" losses have been almost eliminated under the pressure of heavier buying in the East. The demand, however, is largely for steam coal, domestic being shipped on contract only.

Anthracite

No Uneasiness Over Failure To Reach Wage Agreement

Some Inquiries Heard and a Few Orders Placed, but Partial Deliveries Are Rule—Larger Coals Running Short, Steam Sizes Cleaned Up—Demand for River Coal Improves.

THERE is a general absence of uneasiness, despite the failure of operators and miners to get together. The public is only mildly interested in the situation. Some consumers are making price inquiries and a few are placing orders for winter coal, but retailers are husbanding their supplies and generally make only partial deliveries.

The larger sizes are running short and there is a better sale of pea coal, which is moving some tonnage from mine storage. Canadians are inquiring about future deliveries and are seeking substitute supplies. Steam sizes are practically cleaned up or are on order and this has improved the demand for river coal, which has advanced in price.

NEW YORK

The wholesale market is fast becoming clear of the larger sizes, and this condition is reflected in many of the local retail yards. There are retail dealers, however, who have sufficient coal to last them well into July, most of it consisting of chestnut and pea.

Consumers for the most part want stove, and dealers are satisfying their wants as far as possible, at the same time trying to induce them to take part of the order in chestnut. When these sizes are cleaned up there will be little trouble in disposing of the pea coal.

The refusal of the miners to submit their differences to arbitration as proposed by the operators created only a slight interest with the public. The fact that there is no coal being produced to meet next winter's demand is receiving a bare passing notice.

Steam coals are growing scarcer. Continued demand has eaten into the reserve stocks and these are now showing its effect. Rice is hard to pick up while river barley is about the only coal in that size being offered.

BALTIMORE

Some dealers continue to lay up trucks as their stocks become depleted. Few of the dealers now have any considerable amount on hand, and the entire reserve in Baltimore is possibly not more than 3,500 tons. There is some increase in requests for coal, but dealers are merely booking such orders for the future without promise of time of delivery.

The most interesting thing to hard coal men at this time is the raising of the question of the right of the dealers to deliver a 2,000-lb. ton to consumers, if the same rate is charged for coal as for the long ton, thus protecting the rights of the consumer. The local dealers are not entirely a unit on the 2,000 lb. proposition under existing conditions, but the issue was raised by some announcing that they would sell a net ton. The State's Attorney of Baltimore has declared that any effort to sell a 2,000 lb. ton is illegal under both state and city law enactments, which require the delivery of 2,240 lb. He asked to have the police stop and weigh all loads of coal suspected of being less than 2,240 lb. and to report all violations to the grand jury.

ANTHRACITE FIELDS

The men are taking a vote to authorize their leaders to call a strike if they see fit. As far as can be learned every local is giving a vote in favor of a strike. However, some are recommending that the pumpmen, firemen and engineers be left on the job to protect the mines. Although the leaders state that the men will not accept a reduction in wages, from every part of the field the men seem to be more willing to consider a cut of ten per cent.

In the southern field a dealer sold 67 automobiles between April 1 and June 1, and of these, 43 were sold to men who are now out on a strike. Retail sales in the field have fallen off about 50 per cent. There is a continual stream of miners withdrawing savings deposits each week.

BOSTON

The trade shows no developments at wholesale. Shipments of egg and chestnut that were being made in some volume by one of the producing companies have now been practically suspended and pea and buckwheat are the only sizes left in reserve in any quantity.

Retailers are now taking "applications" rather than entering orders. Several of the distributors are down to what would be regarded only as a safe margin for hotels, hospitals and necessary public services.

PHILADELPHIA

There was a big increase in the number of inquiries at retail. People have been stirred by the reports of the operators and miners failing to agree and quite a few of those who have been waiting for lower prices now seem willing to take in coal if they can get it. The retailers have a fair stock of some sizes, although all of them are slowly running out of everything except pea.

Most dealers are still declining to fill a customer's full requirements, and inasmuch as the winter schedule of the past season is still in effect the consumer is usually willing to take what the dealer offers.

Dealers are slowly coming to the companies for some storage pea. Some dealers with a speculative bent are actually going in for quite heavy stocks of this.

In the steam sizes, while the companies do have some buckwheat in the storage yards, several of them are refusing additional orders, stating those already on the books are more than sufficient to take up the entire supply. Rice and barley are out of the market, while river barley is being freely offered and improving sales reported. The price for the river coal still clings around $1.75@$2.50, with the bulk being sold above the minimum.

BUFFALO

Scarcely any coal is moving through the city to local consumers and the Canadian trade is not any more active. All expectation of resumption of mining on July 1 has been laid aside. As a rule the date is figured at Sept. 1. If nothing happens before that time something will likely be done then to get a supply started, for there is good room for fear that with a small supply carried over it will be hard to mine enough after that to keep up during the winter.

Certain Canadians have been asking what they should do about the securing of a supply. Shall they buy as they did some years ago, soft coal, coke or anything that happens to offer, or shall they continue to take their chances? Apparently no very definite answer was expected and none was given.

West

KANSAS CITY

Some of the operating companies in this region are taking the production of the small mines and are having very little trouble in placing it, one company getting as much as twenty-five cars per day. However, it is all mine run and there is an increasing demand for slack or steam coal and little or none to offer. Prices on domestic and mine run are unchanged, while screenings are stronger.

The operators have held two meetings recently with the miners and adjourned, without doing anything. There is a great deal of loose talk as to what will happen when the stocks of coal are used up and the operators try to open the mines.

SALT LAKE CITY

Business here is very quiet now. Demand for slack continues, however, as a result of the improvement in the industrial situation. The domestic consumer is not worrying about the strike any more than he was on April 1 and practically no winter coal has been distributed so far. A year ago the dealers offered a 50c. reduction for a time in an effort to induce storage of coal, but only those who had to buy for current use seemed to get the benefit.

DENVER

The city has dropped the price of coal to consumers 95c. a ton for the best grades and 45c.@75c. for the cheaper grades. A new contract with the United Collieries Co. was given by J. J. Vick Roy, manager of municipal supplies, as the cause of the reduction.

Business appears to be on the increase and operators fear that they will be unable to supply the demand when the expected price reductions are made on July 1.

Chicago and Midwest

All-Around Price Slump Affects Entire Region

Strenuous Field Effort To Maintain West Kentucky High Level Fails—Jobber Group Gets Burnt Again—A 10-Day Lull Expected.

COAL prices in the Midwest passed the peak for June during the past week and slid down noticeably in most markets. A strenuous effort was made in the fields to keep the level up. This was successful for a few days when brokers made a sally into the Kentucky mining regions and picked up several hundred cars which they attempted to place in and around Chicago. When a large share of this coal got into distress and sold at a loss, buying in the field slowed down and with it went prices. The drop in western Kentucky, where operators are most obdurate in their intention of getting $4 for their output, became pronounced by the end of the week. A stern attempt to keep the field level at $3.90 showed distinct signs of failing when a few operators unloaded at a little less and even then found coal on their hands for which the demand was slight.

The general tendency of buyers is now definitely to withdraw from the market for the remainder of the month unless prices drop so low as to make coal attractive. A number of 30- and 45-day contracts and agreements, made by some of the biggest consumers, have practically removed them from the arena. Some of these buyers feel so sure of their position that they have let it be known that they will not feel bound by these agreements if the bottom begins to drop out of the market. Buying, these days, is just as unscrupulous as selling often is on a rising market.

From the standpoint of both the regular jobber and the operator who is jobbing "just to keep my hand in" there is one encouraging sign of late. Dealers and small consumers from all around this section of the land are making numerous inquiries. They are worrying. If the strike situation does not begin to clear itself soon, a buying rush is anticipated. This is one influence which may help to bring the market back to life within a couple of weeks. On the other hand, any definite move to end the strike would "knock the bottom out" and prices would slump.

Some disturbances in the Illinois and Indiana fields have drawn attention this week. A strip mine with 60 men working, is operating near Herrin, Ill., under machine-gun guard without interference and in Indiana a few small mines here and there are producing amid strikers' threats and some fist fights and rock throwing.

CHICAGO

A slow but steady softening of most coals on this market has set in just as was anticipated. During practically the entire week this weakening of quotations was noticeable and by Saturday it was pronounced. Many heavy buyers are stocked for the remainder of the month and are laying off until the drop in freight rates July 1. Some others, notably a few railroads and the railroad buying committee, have orders out covering shipments to be made for the next month or more. All of which takes out of the market most of the signs of life for the time being.

West Virginia coals, both high and low volatile, slumped 25c. or more to a level of about $3.25 for mine run and a shade less for screenings. Little eastern Kentucky spot mine run sold at over $3.25 by the end of the week. Some moved for a nickel less though lump brought as high as $3.50. West Kentucky suffered from the bear movement. Quotations, on the way down, passed $4 by the middle of the week and were pressing close to $3.65 when the week's trading ended. It was prophesied that this coal as well as all others on this market would drop a little lower next week. Many small and medium sized consumers are getting more and more anxious, however, and after July 1, if no settlement of the strike is in view, it is entirely possible that considerable bidding for coal will start. Dealers in this region have practically quit buying, hoping for a substantial drop. Their trade with householders is dead now, but they expect an early fall business if the strike lasts much longer, and few of them are stocked. Hard coal supplies are practically exhausted here.

INDIANAPOLIS

Retail coal prices in Indianapolis are stiffening a little. Prices at the mines in the non-union fields of West Virginia and Kentucky are around the $3.50 limit agreed on by the conference in Washington. When this higher priced coal arrives in Indianapolis and present stocks are depleted, similar rises in retail prices will take place.

The increases coming from the present higher mine prices are to be lessened somewhat after July 1 by the decreases in freight rates. These decreases, however, will effect appreciably only the big buyers of coal. The average reduction in the rate of transportation from working mines to Indianapolis will be only about 28c. a ton.

ST. LOUIS

Storage supplies are running a little bit low and there is more activity in outside buying. This, however, is only among the larger plants. Domestic buying is unusually quiet. Country call is slow except in isolated places where there is a little demand for steam.

The Southern Coal, Coke & Mining Co. on April 1 had about 50,000 tons of coal in storage and will clean up that storage this week. The Union Electric Light & Power Co., it is understood, on June 4 bought 15,000 tons of west Kentucky mine run at a price of under $4 at the mine. The Frisco railroad is understood to have bought some Alabama mine run under $2.

The past week has seen about 200 cars of Alabama coal sold in the St. Louis market for steam. There is, however, a slump on now. The Bell Coal & Navigation Co., of Sturgis, Ky., brought its first barge of Kentucky coal up the river last week for the Laclede Gas Co. of St. Louis.

The last of the Illinois coal is moving out at prices of from $4.25 for screenings to $4.75 for screened coal. Dealers are not buying non-union coal for domestic as yet, preferring to wait.

SOUTHERN ILLINOIS

There is comparative quietness in the southern Illinois Carterville field as well as that of Perry and Jackson County. All the commercial coal is gone, and practically all the railroad coal. Unmarried mine workers are continuing to leave the fields. There is poverty in some cases, but in a general way the miners are taking it easy.

In the Mt. Olive field there is still some coal held for contract customers. The tonnage is not great, and practically everything in the Standard field is about gone.

Indications at the present time are that within thirty days after the mines resume there will be a car shortage that will be a record breaker although the Missouri Pacific is getting most of its coal equipment in shape and some other roads are reported doing likewise.

LOUISVILLE

Quotations in the fields last week rose 15c. to 25c. on western Kentucky coal but orders were so light as to pull the price down again. Eastern Kentucky prices are weaker, as there has been a slump in railroad, steel mill and general industrial buying, consumers not showing a tendency to pay peak prices. As a result lump coal continues firm at $3.75, but mine run which last week was quoted at $3.50, today is selling $3@$3.50. Screenings are scarce at $3@$3.25.

Retailers are advancing prices, and quotations are $1@$1.50 higher than they were prior to the strike. However, retailers are not buying much coal.

WESTERN KENTUCKY

Inquiries continue good but consumers are refusing to close orders at the $4 level, resulting in little new business in the field. It is reported that some business has been taken at $3.90 a ton and less. Last week the market was $3.75, with $4 in sight.

It is claimed that jobbers and brokers last week bought up a great deal of tonnage, but found it no easy matter to dispose of it on the Chicago and other markets at the $4 level, with the result that demurrage is forcing lower prices. This slows down buying until mines short of business will be willing to take a more reasonable figure. Lack of railroad and large industrial orders is said to be felt.

Jobbers claim that they are able to sell on the dips, and could dispose of large tonnage at $3.50, but find that buyers are refusing to meet a price at much over that level. With the reduced freight rates effective July 1, there appears to be a tendency to hold down buying as much as possible until that time.

Northwest

Stocks Are About Gone and Interest Awakens

Many Docks Have Unloaded, Holding Enough Only for Long-Time Customers—Buyers for Railroads and Iron Mines Have Acquired Considerable Supplies.

DOCK stocks in the Northwest are practically exhausted by the constant drains of recent weeks. Railroad and mine buyers have been taking all they could get and shipments toward Chicago have done the rest of the damage. However, it is still possible the Northwest can get a full winter's supply, for it has been done before, though the feat is rather heroic. If dependence has to be put on railroads for this supply, there may be another obstacle to overcome. A car shortage has already begun to show itself. Dealers in back-country towns are expected to come into the market soon. They have held off during the last week or two presumably because of the high level of prices.

MINNEAPOLIS

The local papers of late have pointed out that available stocks of hard and soft coal on the docks are perhaps 15 per cent of the winter's needs and that it is going to be hard to get enough coal for the winter. While it has been argued that the Northwest cannot get a supply in less than four or five months, yet past experience has shown that although it is not easy nor comfortable, yet it has been done.

There is already quite a car shortage even though little coal is moving; it doubtless will be worse when the heavier demand of fall begins. Reports from the mines are that open-top cars are scarce. Railroads right now in Minnesota are furnishing box cars for shipping gravel because they are short of open tops.

The Northwestern coal market is about at a standstill. There is over 300,000 tons of hard coal on the docks, but 40 or 50 per cent of it is in unpopular sizes.

DULUTH

Stocks of bituminous coal on the docks as of June 1 aggregated 2,375,000 tons and of anthracite 385,000 tons. The docks were estimated to have only 780,000 tons of free bituminous coal on hand, or about one-third of the total supply at the beginning of this month.

This is regarded by dealers as showing a serious condition should the miners' strike continue for even a few weeks to come. Since the first of the month demand has increased greatly from mining interests and railroads.

The supply of soft coal is cut down by a continuance of cargo shipments to Lake Michigan ports for delivery to railroad companies. As a result some of the dock companies have practically disposed of their entire surplus supplies. Four companies have indicated that they are out of the market except to take care of customers of long standing. Dealers in towns throughout the Northwest are expected to start buying in a week or ten days, and this will easily exhaust surplus stocks held on other docks.

Lump is fluctuating around $7@$7.50, with the market nearer the top than the bottom. Screenings are high between $5.50@$6. Every indication points to a rise in prices rather than any lowering.

MILWAUKEE

With a known shortage of 318,931 tons of anthracite, and 471,386 tons of soft coal, as against last year's Lake receipts, it would be only natural that there should be a clamor for coal. The contrary is the case, however. Everybody seems to be holding off and the market is dull and depressed. Western Kentucky coal has been freely offered, but the price, $3.50 at the mines, is too high to entice dealers to taking it on in the present state of the market.

Receipts of soft coal by Lake thus far this season are far below those of last year. The record up to the middle of June is as follows:

	Hard	Soft
April	8,000	100,309
May	....	195,251
June	....	118,953
Total	8,000	414,513
Same period in 1921	326,931	885,899
Decrease	318,931	471,386

One cargo of 10,000 tons of soft coal was received from Superior, Wis. It was a case of shifting coal between two yards of the Great Lakes Coal & Dock Co.

The following are the retail prices at Milwaukee at the present time:

ANTHRACITE	
Egg	$15.70
Stove	16.00
Nut	15.95
Pea	14.00
Buckwheat	11.50
BITUMINOUS	
Pitts., Hock. and Yough. screened	$9.25
Pile run	7.25
Screenings	6.25
West Virginia screened	7.50
Pile Run	7.00
Screenings	6.50
Pocahontas screened	10.75
Mine run	9.25
Screenings	6.50
Kanawha Gas mine run	7.00
Illinois and Indiana screened	7.50
Pile run	7.00
Screenings	6.00
Coke, large sizes	13.00
Pea and nut	10.00

New England

Deadly Dull Market Lacks Even Relief of Bright Spots

Railroads and Industrials Interested Only in Monthly Quotas on Bargain Basis—Hoover Levels May Not Even Be Reached—Ample Supplies Seen in Non-Union Sources.

THERE are no bright spots in the current market. Trade hardly could be duller than it is at this writing. We rather doubt whether July will show any material change in the demand for steam coals. Neither railroads nor large industrials show much interest except in getting monthly quotas on low-price contracts and it remains to be seen whether the Hoover levels will be reached, let alone being exceeded. For the present at least it is clear that non-union mines in the Pocahontas and New River districts are amply able to supply current requirements in Tidewater territory in New England. And non-union mines in Pennsylvania shipping all-rail can take care of the rest, on the basis of present-day consumption.

Receipts both by water and all-rail continue relatively rather light. Doubtless this is partly due to the reduction of 10 per cent in railroad tolls, effective July 1, but to trade and manufacturing conditions here there is no snap whatever. The vacation season is on and all hands seem determined to take it easy for the next two months, if not longer. Meanwhile, contract shipments are coming forward in fair volume, and some of the agencies are wondering why they didn't sell more at early season figures.

Efforts to reopen textile mills where unions are supporting a strike are only moderately successful. There is only a light demand for goods and so many plants of this kind are now using oil that the reaction, when it comes, will not mean a very largely increased call for coal. The railroads are of course using less per diem during these days of small traffic and it is hard to see any indication as yet of the long-awaited improvement.

Except for gas coals from Philadelphia and Baltimore, receipts here by water are almost exclusively from Hampton Roads. At the terminals there the accumulations are still heavy and the spot market rather sluggish. Prices are little, if any, above the $6 level f.o.b. vessel at the piers, and there if a feeling among buyers here that by waiting until July for hand-to-mouth purchases they will at least save the 28c. that is to be taken off rates from the mines to the Roads.

Coastwise freights show no change from the figures previously quoted, 90c. @$1, depending on size, being the market quotation for steamers and large barges. Smaller craft secure a differential over that.

Eastern Inland

Strike-Settlement Gossip Has Unsettling Market Effect

Prices Fall and Demand Wanes, Save for Connellsville Coal, Which Is Strong With Quotations Firm—July Freight Cut a Deterrent—Lake Buyers Perk Up as Prices Sag.

RUMORS of attempted strike settlement have broken the market, except for Connellsville coal, which is still going strong with firm prices. Elsewhere prices have dropped and demand has waned. West Virginia and Kentucky coals have dropped as much as 75c. A further deterrent is the freight rate reduction on July 1, which is causing all buyers who can do so to stay out of the market during the balance of June. Lake buyers are becoming more active as prices decline.

CLEVELAND

Indications that the strike will be settled soon and that union mines may resume operation by July 1 have completely demoralized the coal market in this district. Non-union coal is in abundant supply, a considerable amount being left on tracks with no takers. Price declines have been drastic. A week or so ago consumers were paying $3.75@$4 for Kentucky and West Virginia coal. That fuel is going begging at $3.25. Ohio wagon mine coal formerly was $4 and now is quoted $3.50.

Consumers apparently are convinced that production will soon be under way in full swing. In addition they expect to derive some price benefit from the freight reduction due July 1. These considerations combined have brought about the present slump. Any threatened breakdown in negotiations for peace would cause a scurry to buy coal. Stocks are getting lower each week and the famine point is not many weeks distant. Plant operations continue good but further expansion is hardly to be expected during the summer months. In fact automobile and steel mill operations may sag slightly in July and August.

The Northwest continues to grow more anxious about its supplies and operators are just as anxious to start production and begin the movement up the Lakes. Less than 2,000,000 tons have been sent and about 20,000,000 tons are needed. Every week's delay will make it that much more difficult to get coal to the Northwest in ample quantity.

NORTHERN PANHANDLE

Since the beginning of proceedings against some of the strikers who have been active in trying to force a suspension of operations and since those awaiting trial have been put on their good behavior there has been less trouble in Ohio, Brooke and Marshall counties and mines are maintaining production at about the level of 60,000 tons a week. The market is absorbing all the coal available. Railroads are utilizing a large tonnage.

BUFFALO

The price is going up and the sensational shipper is saying that it will go on up steadily from now to the time something radical comes in to stop it. At the same time the consumer is holding off as much as he can, for the reduced rail rates are to cut down the price a matter of 25c. a ton to this market. Actual demand will increase considerably as soon as July comes in and the operators seem likely to take advantage of the stir.

Even the cautious shipper is usually advising consumers to buy now if they have only small stocks. At the same time there is the contradiction of quite a large amount of coal standing on track at times unsold. The wise buyer can generally get what he wants from that source, though he may not always know what the quality is.

Prices are strong at $3.75 for slack to $4.25 for ¾-in., with Pittsburgh operators quite often asking $4.50. Our shippers report that they have not been able to get the asking price yet, but they seem to be expecting that it will be paid before long.

Lake receipts of Pocahontas from Ohio ports were 42,100 net tons last week, the falling off being at least in part because some of the local docks are badly congested, with several cargoes waiting.

EASTERN OHIO

Inquiries have noticeably diminished and demand is at a minimum. The underlying cause for this situation is said to be due to the various rumors predicting an early settlement of the strike. Likewise, the great majority of consumers have sufficient coal on hand to carry them some weeks yet and they are safeguarding against having a lot of high-priced coal on hand when mining is resumed at a lower production cost, together with reduced freight rates which are to become effective July 1.

Eastern Ohio stripping mines are producing something over 50,000 tons per week since issuance of permanent injunction by the Federal Court at Columbus, restraining union miners from interfering with or intimidating employees. Such wagon mines as are producing are said to be furnishing fuel to the nearby industries, but no estimate is available as to the extent of their output.

In the Lake trade, shipments continue light, the fleet having loaded only 283,531 tons of cargo coal last week as compared with 1,033,684 tons the same week last season. Shipments for the season up to June 12, were 2,565,176 tons, or 4,132,750 tons less than for the same period of 1921. Shipments for the same period of 1920 were 2,284,033 tons.

Receipts of bituminous coal at Cleveland during the week ended June 10 were slightly in excess of those of the preceding week, total arrivals being 994 cars, 913 cars of which were for industries and 81 cars for retails yards.

PITTSBURGH

The most important developments in the strike situation in the past week occurred in Illinois and Indiana, where the operators publicly committed themselves as being permanently opposed to a four-state agreement on wages. The position of these operators had been known in the trade, but the public position of the Pittsburgh and southern Ohio operators, who formally declared against the four-state agreement last January, has been strengthened. The Pittsburgh district operators are observed to be a unit in this matter as well as in their determination not to accept the check-off again.

The invitation sent by the Pittsburgh Coal Producers' Association to District No. 5, U. M. W., promptly declined by the latter, was assumed in many quarters to be a preliminary step to an effort to reopen some of the mines in the district, but no developments in this direction have thus far occurred. It is still thought probable that at any moment some moves in this direction may be made.

The chief trading in the local market is in Connellsville coal, which has readily maintained the advance scored a week ago, being quotable at $3.75@$4 for steam grade. Byproduct does not seem to be offered. The non-union strikes in the Connellsville region are holding out very well, the increase in production being very slow.

COLUMBUS

There is still a rather unsteady market due to the fact that consumers generally are waiting until after the reduction of freight rates July 1. Only such users that must have stocks at present are in the market and this demand is not nearly as strong as formerly. Prices range slightly below the Hoover figures. Some distress coal is reported at certain points, but on the whole there is not much tendency to reduce prices.

Buying for utilities and railroads is the best feature. Retail prices are steady at former levels, with Pocahontas lump around $7.50@$7.75 and West Virginia grades, $7@$7.50.

Lake trade is progressing as rapidly as could be expected under the circumstances. The H. V. docks loaded 865,520 tons to June 15.

DETROIT

Buying of bituminous coal continues on a small scale, with very little demand for either steam or domestic sizes. There is not much coal coming in, but jobbers say free coal is not difficult to find when it is required. One of the reasons for deferred purchases is the postponed application of the reduction in freight rates.

In this connection the jobbers are of the opinion that there is likely to develop so extensive a demand soon after the rate reduction occurs that the buyers will find themselves paying mine prices that will make their coal more costly than with the present freight charges. Practically no business is being done in domestic coal. So far, the retailers have made almost no start on distribution of coal for next winter's requirements.

Cincinnati Gateway

Offerings Cause No Rush Of Buyers; Sag Continues

June Steel-Mill Requirements Provided For, Market Is Flat—L. & N. Places Embargo on Return of Empties—Smokeless Moves Inland in Heavy Volume.

THE first upward climb that followed the announcement of Secretary Hoover's maximum prices went the limit and values have fallen back. Steel people have apparently covered their June requirements and buying is nil. The beginning of the week saw coal being offered without any great rush of buyers and the sagging continued to a point where the L. & N. R. R. was called upon to place an embargo against the return of empties to the mines in the Harlan and Cumberland area because of the number of loads that were standing without orders. Smokeless is coming Inland in heavy volume, as the Tidewater market is less attractive.

CINCINNATI

The drop in high-volatile prices allowed some of the Lake buyers to get in the market again but those in Cleveland and Toledo refused to go higher than $3 and while this is being written the softness there has an indication that this is the top and if there is any great rush of tonnage in response there will be lower prices. Steel plant buying is almost nil. Retailers will not come in the market until the reduction in freight rates.

The smokeless situation is about in the same boat with the bituminous. Tidewater business has settled down to the same old grind and in consequence the heavy volume has again turned Inland. Some of the old line companies are holding to the Hoover maximum but with concessions. Others that have been leaders in reductions have dropped to a high-volatile basis. Some domestic business is being booked for the beginning of July and if there is a much further drop it is likely that a good many mines will return to sizing their coal.

There has been no change in the retail situation. Various suggestions that the local prices should be advanced to meet the maximum that was placed in Washington have fallen on deaf ears and most of the companies are booking orders for deliveries clear up to October on the following basis: Pocahontas lump $8, mine run $6.50@$6.75, bituminous lump, $6.75 and slack, $4.50@$5.

SOUTHEASTERN KENTUCKY

Buying is not so keen as it has been. Best mine run has dropped back to $3, while some of the lower grades brought around $2.75@$2.85. Block is coming back into notice, there being a ready demand at $3.50@$3.75, while egg is not far behind. Announcement has been made by the L. & N. that there would be no further cars furnished at the mines this week, on account of necessity of cleaning up congestion between mines and Cincinnati.

HIGH-VOLATILE FIELDS

KANAWHA

Despite interference on the part of striking miners, production is being gradually increased. The bulk of the production is coming from the small mines and from a group protected by an injunction. Demand is principally for steam coal. There does not appear to be any chance of an agreement in sight and producers are operating wherever there is any sentiment among the miners favoring a resumption.

LOGAN AND THACKER

Production continues on an unusually large scale in the Logan field. May established a new record but one which operators believe will be exceeded during June owing to a well sustained demand. The only factor standing in the way of a large tonnage is the need for more men. The market is active and there is comparatively little free coal now available.

Kenova-Thacker mines are loading more coal than they ever did. No efforts are being made to interfere wtih operations in view of the injunction still in effect. Producers are finding a ready market for their output, the greater part of which is flowing to Western markets and to the Lakes.

NORTHEASTERN KENTUCKY

Buying is on a heavier and steadier scale now that the general situation has become more stabilized through the fixing of prices. Not only are the railroads taking much coal but there is also a brisk demand among industrial concerns. More men could be utilized, as labor shortage losses amount to about 16 per cent.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

New River Mines are producing more than at any time since the beginning of the strike. Miners within the last week or so have been comparatively free from interference. Incentive for heavier production is to be found in a growing demand. There is a better movement, particularly to Eastern points.

In the Gulf region production is on a larger scale than at any time in the history of the field, having almost reached 200,000 tons a week. Lack of man power is still the most serious factor in retarding production. Tidewater shipments have been increased and dumpings are unusually heavy.

POCAHONTAS AND TUG RIVER

Pocahontas output is averaging close to 450,000 tons a week. It is simply a question of securing more men, since labor shortage losses now amount to about 80,000 tons a week. There are no "no market" losses in this territory. The movement to Eastern and Western markets is heavy and the demand at Tidewater has been growing.

Conditions remain unchanged in the Tug River field. mines producing at the rate of about 90 per cent of capacity. Mine disability alone stands in the way of 100 per cent production. Mines are sending rather large tonnage to the Lakes and are also marketing a heavy volume in the steel districts.

Coke

UNIONTOWN

The situation is relatively unchanged with the exception that conditions in the homes of many miners have become acute and that the operators are using more aggressive action. Evictions of strikers are now proceeding daily and in large numbers. At Alicia plant of the Pittsburgh Steel company last week 43 families were evicted in one day and in some instances the families of workers were waiting to move into the house immediately.

The market continues strong with the team-truck mines resuming since the Hoover price of $3.50 is not operative in this district. A maximum of $4 has been reached for coal and there is no difficulty in selling all that is offered, principally among steel interests. Buyers are not particular as to quality and the tops of some of the cars leaving the region show a varied assortment which could not pass inspection in normal times.

CONNELLSVILLE

The trend in blast furnace operations is upward. Offerings of Connellsville coke do not seem to have increased, although production tends to gain steadily. Contract shipments absorb a large part of the merchant output and there is probably some coke moving from producers to regular customers at adjusted prices, without passing through the open market.

There is much latent demand for coke, i.e., there are not only many furnaces that would buy if they could get a price somewhat around normal, but also some furnaces that would probably pay approximately present prices if at the same time they could be assured of a regular supply. But it is not considered feasible to try to start a furnace and operate it on prompt lots picked up from time to time.

Demand for foundry coke continues relatively light and consumers are not bidding up the market, although prices are a shade stiffer than a week ago. Quotations stand at $7@$7.25 for furnace coke and $7.50@$7.75 for foundry.

The *Courier* reports production during the week ended June 10 at 45,288 tons by the furnace ovens, and 13,375 tons by the merchant ovens, making a total of 58,663 tons, an increase of 10,193 tons, representing a recovery from the holiday week.

BUFFALO

Local iron furnaces are busy, but the by-product coke ovens are also quite as busy and the supply meets the demand. The furnaces are surrounded by huge piles of supplies. The amount of iron shipped out is large. Coke quotations continue at $7 for 72-hr. Connellsville foundry, $6 for 48-hr. furnace and $4.50 for stock.

News Items From Field and Trade

ALABAMA

The Arco Coal Co. has been incorporated in Tuscaloosa, and has leased about 1,440 acres of coal lands about twelve miles from that point near the L. & N., from which the coal will be mined by the hydraulic stripping process. The company is capitalized at $20,000. J. D. Henerson is president, A. C. Smith, vice-president, and Fleetwood Rice, secretary. Headquarters will be in Tuscaloosa. Development work will be started at once.

The Alabama By-Products Corporation, Boyles, has let a contract to the Koppers Company, of Pittsburg, for an addition of twenty-five Koppers ovens to its present plant, at a cost of $1,250,000. This represents an increased capacity of 50 per cent and will enable an annual production of about 365,000 tons of coke or a consumption of 550,000 tons of coal, which will come from the mines of the Majestic and Imperial coal companies, subsidiaries of the corporation.

The Montevallo Mining Co., through David Roberts, trustee, has entered into a contract with the State of Alabama to use convicts for an additional term of three months on basis of the rates in effect prior to the receivership, when the convict labor was temporarily suspended and the contract abrogated. The question of reinstatement of the contract and dissolution of the receivership is now pending before the United States Court of Appeals, New Orleans.

CONNECTICUT

The Berkshire Mill Coal Co., Bridgeport, was organized recently by the election of the following officers: James A. Barri, president and treasurer; R. S. Terry, secretary and assistant treasurer. Messrs. Barri and Terry, together with William B. Boardman, constitute the Board of Directors. The concern was recently incorporated and will carry on a general coal business with yards on the Pequonnock River.

ILLINOIS

In the foreclosure proceedings of the **Smith-Lohr Coal Mining Co.,** of Pana, a decree has been entered against the company for $185,937. M. H. Seller, of Pana, has been appointed receiver. Ora H. Brown was appointed special master-in-chancery to sell the property unless redeemed in 20 days.

John A. Garcia, mining engineer, has left Chicago for Utah where he is to examine some large coal and iron deposits in prospective development. He expects to go on to San Francisco to report after he has completed his field work and thence to New Mexico, where the Allen & Garcia Co. is building a very large skip-hoisting mine for the Gallup-American Coal Co., Gallup. Mr. Garcia expects to return to Chicago about July 5.

The Union Colliery Co., of St. Louis and Chicago, was recently awarded the sum of $1,500 in a lawsuit against the State of Illinois. The new state highway, which is now under construction near the company's mine yards at Dowell, cuts directly across the mine yard tracks and the company was claiming damages to the amount of from $200,000 to $400,000.

J. M. Dillavou, head of the Harris-Dillavou-Dimond Co., Chicago, was in the southern part of the state recently visiting mines operated by that company.

The Springfield-Athens Coal Co. recently filed dissolution notice with the secretary of state and will discontinue business.

Thomas Horn, West Frankfort, in charge of the mines of the Southern Gem Coal Corporation in southern Illinois, was a recent visitor in the main offices of the company at Chicago.

The Steamship Fuel Co. has established a Norfolk office with J. H. Gibson in charge, to deal in general coal business, domestic and export.

George H. Loeb, formerly manager at Norfolk for the Central Pocahontas Coal Co., and now connected with the Cincinnati office of this company, was in Norfolk recently.

The American Coke & Chemical Co. will put down two test holes in the vicinity of McLeansboro. This company has purchased a number of options on Hamilton County coal lands. It is expected that some extensive coal prospecting will be done in this vicinity in the next few years.

INDIANA

Hiram L. Ireland, of Princeton, has filed a suit for $30,000 against the **Francisco Mining Co.,** alleging that the company has removed 10,000 tons of coal from mines which extended under his land. He values the coal at $3 a ton and asks damages in the amount of $30,000, also a restraining order demanding that no further mining be done under his land.

Fight for the control of the stripping fields in southern Pike County started recently when the **Enos Coal Co.** brought suit against Claud E. Beatty and V. E. Beatty, to compel them to cancel a deed made to Gray Brothers, of Evansville, and sell to them, under a prior contract, ninety acres of coal land in Monroe township, on which the Enos company already has constructed a lake, twenty-five acres of which extends on the Beatty land. The Beattys obtained an option on the ninety acres last year for $7,125, of which $2,500 was paid in cash and the balance to be paid in one year. In the meantime the Enos company took over the holdings of the Cummins Coal Co. and built a large lake on part of the Beatty property, installing pumping stations and pipe lines. After the year had elapsed and the Enos company had not paid the balance due on the purchase price to Beatty, he sold the same land to R. R. Williams, representing Gray Brothers, for $10,000 cash. In making the sale, one-half of the Enos company's lake was included in the deal. The Enos company immediately filed suit to enjoin Gray Brothers from entering upon the property and interfering with the work of the Enos company and are also asking that the deed be set aside on the grounds that the defendants failed to give it an abstract of title within the year. The company deposited with the clerk of the Pike Circuit court, $4,625, balance due Beatty, and are asking that the sale between Beatty and Williams be set aside.

A mob estimated at 400 persons left Terre Haute recently in automobiles after announcing their intention of closing every coal mine in operation between Terre Haute and Brazil. The first stop made was at the Jones Mine near Staunton, where two trucks loaded with coal were seized and the contents dumped into the road. Two guards at the mine were disarmed by the men when they entered the mine. The men also visited the Robert Hughes Mine, five miles from Terre Haute, but the shaft was found to be deserted and the crowd moved on.

KENTUCKY

A number of new coal companies have been chartered recently. Among the newcomers are: **Excelsior By-Product Coal Co.,** Pikeville, $125,000; Charles K. Wagner, Robert Wallace, C. C. Frazier and H. B. Wright; **George Coal Mining Co.,** Middlesboro, $600,000; M. L. George, J. W. Wilson and C. W. Miller; **Finley Coal Co.,** Madisonville, $35,000; Thomas E. Finley, Ella Campbell Finley and Curtis B. Johnson; **Bermuda Coal Co.,** Chavies, $100,000; Carol Robinson, M. L. Stone and Lewis E. Harvie.

The Mahan Jellico Coal Co. is building a new tipple at Packard to replace the one destroyed by fire April 13. The new tipple will be 80 ft. long and 50 ft. wide. The tipple will be of steel and will cost from $18,000 to $20,000. The company has offered a reward for information leading to the arrest of persons who fired the old tipple.

At a second sale of the **Boyce Coal Co.** property ordered by the courts, **Thomas E. Finley,** Madisonville attorney, was the highest bidder and the holdings were knocked down for him for $17,000. Mr. Finley said that he would organize a company to be known as the **Finley Coal Co.,** to be composed of himself and his three sons as incorporators.

MASSACHUSETTS

The Miller Coal Co., Inc., Boston, has been incorporated to deal in coal. The company's capital stock is $50,000, and the incorporators are: Fred Miller, Newton; Charles W. Gammons, Cohasset; Irvin McDowell Garfield, Boston; Alexander Whiteside, Boston, and Joseph W. Glidden, Newcastle.

MISSOURI

A petition in equity has been filed in the Macon County Circuit Court by Ernest Frederick and Sadie M. Frederick against Joseph Gates and Lillian P. Gates. The parties to the suit are owners of the **Star Coal Mines** at Bevier, the Fredericks having a two-third interest and the Gates a one-third interest. The petition asks for a dissolution of the partnership and an accounting. It recites that the parties have disagreed and that the defendants have stopped the payment of funds in the bank, necessary for the conduct of the business. The company's property at Bevier is estimated to be worth $60,000 to $70,000.

The Cable Coal Co., at Connellsville, has resumed operations, according to J. T. Hatfield, an officer in the company. He says the company is a co-operative concern and for that reason withdrew from the union, but said it was not a non-union coal mine.

A coal boom is likely to develop the west side of Randolph County and will be carried into effect as soon as the present coal strike is called off. Men with drills are now at work locating the coal veins.

L. S. Harlan, president of the Clifton Hill Banking Co., has devoted considerable time to the proposition and has secured options on several thousand acres of coal lands where it is expected the coal field will be developed. This land lies north of Clifton Hill and extends up to the Thomas Hill country. It is known that several prominent citizens of Bevier and Macon have large coal interests north of Clifton Hill and will put forth every effort to develop this field.

A special meeting of the stockholders of the **Callaway County Coal Co.,** which has mines at Carrington, will be held this month for the purpose of electing directors and to vote on a resolution to dissolve the company, close up its affairs and dispose of its assets. F. L. Crosby is president of the company, and Carter Norris, of Fulton, is secretary. The meeting was called at the request of a majority of the directors and stockholders.

NEW YORK

The Consolidation Coal Co. has announced the appointment of **Walter D. Barrington,** of New York, assistant engineer of tests, as consulting sales engineer with headquarters in the Munson Bldg., 67 Wall St. Mr. Barrington formerly lived at Fairmont, W. Va.

S. G. Symons, purchasing agent for Cosgrove & Co., Johnstown coal operators, attended the recent annual convention of the National Association of Purchasing Agents at Rochester. A standard contract for the use of the members was adopted and the buyers there were very optimistic with reference to the national coal strike.

A visitor in New York during the early part of June was **Harry B. Clark,** identified with the Clark coal interests of northern West Virginia.

George Otis Smith, director of the Geological Survey, and **Hugh Archibald,** mining engineer and author, were the witnesses at the hearing of the Public Committee on the Coal Strike, held on June 13, at the Engineering Bldg., New York City.

Willis H. Brown, who has offices at No. 1 Broadway, New York, has gone to his cottage on the shores of Lake Ontario for the summer.

Frederick J. Kerner, who for some time was the manager of the export department of W. A. Marshall & Co., has organized the **F. K. Kerner Coal Co., Inc.,** with offices at No. 1 Broadway, New York, and will conduct a general wholesale coal business.

OHIO

The Sunday Creek Coal Co., Athens, has announced that it has withdrawn from its stand of no check-off for pumpers employed at its various mines during the time of idleness. When the strike was declared the company sought to have its pumpers withdraw from the union and be employed as assistant superintendents, but this policy failed and now the pumpers are being employed at the regular scale with the check-off in vogue.

The Columbus Board of Education has rejected coal bids recently received for approximately 10,000 tons of lump for the various school buildings and has readvertised for bids to be opened July 6. It is hoped that lower prices will be secured at that time.

The Colonial Fuel Co., Columbus, chartered about six months ago with an authorized capital of $25,000, has been organized to take over the retail business of the Colonial Coal & Supply Co., of Columbus. W. H. Plant is at the head of the company.

President W. M. Puckett, of the Cabin Creek Consolidated Coal Co., with headquarters at Charleston, spent the early days of June in Cincinnati on business.

Geo. H. Ewald, president of the Standard Tide & Inland Coal Sales Co., with headquarters at Charleston, was a business visitor in the Cincinnati market during the early days of June.

The Liggett Coal Co., with a paid-up capital of $75,000, has been formed with Harry Liggett as president, Harry S. Adkins, as vice-president, and G. P. Foley, as secretary, to take over mining properties in the Hazard district. While this is a Kentucky corporation the offices will be maintained in Cincinnati and the bulk of the coal will be moved to take care of the retail trade of the Liggett Bros. Coal Co. This Cincinnati concern is building new hoppers and will expend about $20,000 in the improvement. The coal properties will be improved by an expenditure of twice that amount as soon as feasible.

Sam Mats, of Raven, W. Va., operating head of the Red Ash Pocahontas Coal Co., was in Cincinnati recently, as was **Herman Everett**, sales manager of the Smokeless Fuel Co., who visited his local office, the Western Coal Co.

S. McBeth, who for some time was connected with the Tuttle Coal Co., takes the place of **George H. Loeb** with the Central Pocahontas Coal Co., in Cincinnati, who has been transferred to take charge of that company's office at Norfolk.

PENNSYLVANIA

Robert Y. Williams, general superintendent of the Hudson Coal Co., has been elected president of the Rotary Club, Scranton, for the yearly term, beginning May 1.

The Concordia Electric Co., Pittsburgh, manufacturing the cap lamp, Bureau of Mines Permit No. 15 in June, 1916, under Schedule 6A, has secured two new Bureau permits under Schedule 10A, on its electric hand lamp—one for hand lamp service and one for trip lamp service.

Judges Buffington and Thompson, of the United States District Court in Philadelphia, have entered an order permitting the Continental Insurance Co. and the Fidelity-Phenix Fire Insurance Co., both of New York, to withdraw their petitions, filed Dec. 9, 1921, to set aside the sale by the Central Railroad Co. of New Jersey of its **Lehigh & Wilkes-Barre Coal Co.** stock to the Reynolds syndicate, under the Reading dissolution plan. The order also grants permission to Isaac T. Starr and Mary W. T. Starr to intervene in the Reading dissolution case for the purpose of asking the court to set aside the sale of the L. & W. B. stock, both the railroad company and the Reynolds syndicate having ten days in which to file answer.

Seven striking miners arrested at the operations of the **Big Bend Coal Mining Co.**, at Twin Rocks, Cambria County, during a disturbance at the mines, waived hearings before Justice of the Peace C. P. Roland at Ebensburg and were released on bail for their appearance at court on charges of riot and assault.

Twelve families of striking miners were evicted in the vicinity of the **Reading Mine** at Stoystown, Somerset County. The union is providing tents to shelter the families.

As a result of a demonstration staged by striking miners at the mines of the **Huskin Coal Mining Co.** at Cairnbrook, Somerset County, information was made against 21 men charging trespassing on company property. The warrants were served by Sheriff John W. Griffith, of Somerset County. The men arrested were all strikers from the Shade Coal Mining Co., at Miller Run and, it is alleged, they interfered with the men while at work for the Huskin company. At a hearing before Justice of the Peace Patton at Windber, each was fined and compelled to pay the costs.

One mine foreman of the Lehigh Valley Coal Co. was instantly killed in a recent explosion of gas, which occurred in the Coxey shaft, and another mine foreman was slightly injured.

Walter J. Evans has been appointed manager of the Philadelphia sales office of the Webster Manufacturing Co., with headquarters at 719 Commercial Trust Bldg.

The following bituminous coal companies have filed notice at Harrisburg of increases made in their capital stock: **Acme Coal Mining Co.**, Centre County, $300,000 to $695,000; Samuel Shavit, treasurer; **Ferrier Run Coal Co.**, Cambria County, $50,000 to $100,000; **Mahoning Coal & Coke Co.**, Fayette County, $5,000 to $50,000, K. K. Kramer, president; **The Bowman Coal Mining Co.**, Allegheny County, from nothing to $100,000.

TENNESSEE

Announcement has been made that the **Dayton Coal & Iron Co.**, Dayton, has been reorganized and that the entire plant would be placed in operation as soon as possible. Arthur N. Wickshire is president, John T. Pell, vice-president, and Harry I. Sheldon, treasurer, all of New York. The plants have been idle for a year, due to financial difficulties, having been in the bankruptcy court and changed hands several times. Besides all the mines, two furnaces which have been idle for some years will be blown in, a new vein of coal recently discovered will be worked and coke ovens fired. The miners at Dayton have never been organized and no trouble is expected in securing labor.

J. Martin Adams, J. M. Adams, Franklin Adams and M. D. Duke have acquired the property of the **Martin Coal Co.**, of Martin. The plant of the company will be overhauled and enlarged.

TEXAS

The Liberty Grain & Fuel Co. has been organized at Dallas to conduct a general grain, coal and wood business; capital stock of $30,000. The incorporators are: G. M. Patillo, L. G. Patillo and W. E. Conn.

Development of lignite beds between Dallas and Greenville will be started immediately by the Lignite Industries Corporation, of St. Paul, Minn., according to the president of the corporation. Six plants will be built in Texas for treating lignite. These plants will be located at Dallas, Fort Worth, Houston, Galveston, Greenville and one other city yet to be selected. Options have been obtained on 100,000 acres of lignite land in Texas. It is planned to form a separate corporation in Texas to be known as the **Texas Lignite Co.** to handle the Southern development.

UTAH

A mine guard was shot and killed and the general manager of the **Standard Fuel Co.**, of Standardville, and an unidentified Greek miner were wounded recently when a railroad train carrying new miners to the company's mine was fired on by men in ambush.

Governor Mabey, on learning of the shooting, sent National Guard troops to the coal area and issued a proclamation declaring martial law in the Carbon County district.

VIRGINIA

E. O. Parkinson, of the Pocahontas Fuel Co., headed a group of coal men who presented a silver loving cup to **Norman R. Hamilton**, retiring collector of customs, who concluded eight years in that office June 1.

O. B. Ferebee, of Nottingham & Wrenn; **J. G. Miller**, of Raleigh Smokeless Coal Co., and **T. M. Bailey**, of Virginia Smokeless Coal Co., represented Norfolk coal men at the recent Hoover conference in Washington.

WEST VIRGINIA

General improvement in the coal industry was reflected in the months of March and April by a growth in the number of new companies launched. In March there were nine new coal concerns organized and in April nearly twice as many. The aggregate capitalization of new companies formed in March amounted to $1,900,000 and the aggregate for April was $1,055,000. One of the new coal enterprises has a capitalization of $1,000,000. Companies organized, in March and April, together with the capital stock, are: **Onondaga Splint Coal Co.**, Charleston, $100,000; **Lockview Coal Co.**, Morgantown, $350,000; **Keystone Coal Co.**, Charleston, $150,000; **West Virginia Gas Coal Co.**, of Shinnston, $1,000,000; **Acme Coal Co.**, of Shinnston, $50,000; **Blocky Pittsburgh Coal Co.**, of Morgantown, $100,000; **Alliance Coal Co.**, Core, $50,000; **Alley Branch Coal Co.**, Chattaroy, $75,000; **Taylor Fuel Co.**, Morgantown, $25,000; **Good Hope Coal Co.**, Grafton, $25,000; **Dean Coal & Mining Co.**, Elk Garden, $150,000; **Huntington Coal Distillation Co.**, Huntington, $250,000; **McRoss Smokeless Coal Co.**, Logan, $75,000; **St. George Coal Co.**, Julian, $25,000; **Pocahontas Red Ash Coal Corporation**, Iaeger, $50,000; **J. A. Wood Coal Co.**, Amigo, $50,000; **Raleigh Smokeless Coal Land Co.**, Beckley, $100,000; **North Branch Coal Co.**, Piedmont, $60,000; **Elkhart Fuel Co.**, Charleston, $10,000; **Fulton-Glenwood Coal Co.**, Wheeling, $10,000; **Burdett Fuel Co.**, Morgantown, $25,000; **Groves Block Coal Co.**, Wheeling, $10,000; **Great Western Coal Co.**, Des Moines, Ia., $100,000; **Southern Elkhorn Coal Co.**, Huntington, $100,000.

The following West Virginia coal concerns have recently been granted authority to increase their capital stock in the amounts given: **Chesapeake Coal Co.**, from $250,000 to $1,000,000; **Bull Creek Mining Co.**, from $100,000 to $150,000; **Margarette Coal Co.**, from $300,000 to $500,000; **Winner Gas Coal Co.**, from $50,000 to $150,000; **Kanawha City Coal Co.**, from $150,000 to $300,000.

The West Virginia Coal Co., a foreign corporation, has withdrawn from West Virginia.

The following West Virginia coal companies have discontinued their business and their corporate existence has been dissolved: **Shawnee Coal & Coke Co.**; **Rosebud Coal Mining Co.**; **Cleveland Gas Coal Co.**; **Black Star Coal Co.**; **W. P. Rend Collieries Co.**; **W. P. Rend Coal & Coke Co.**; **Fairmont By-Products Corporation.**

The D-K-C Coal Co. has been launched by A. J. Dalton, J. A. Kelly, John F. Grossenbach, G. M. Angell and E. L. Hogsett, of Huntington, this company to have its headquarters at Huntington. Mr. Dalton, Mr. Kelly and his associates recently completed negotiations for 52,000 acres of coal and timber lands in Wyoming County. No plans for the development of the acreage purchased has been announced yet.

Offices have been opened in Clarksburg by the **Will-Earl Coal Co.** which was recently organized with a capitalization of $10,000. Interested in this company are E. O. Horner, F. Rogers, E. T. Rogers and E. A. Bartlett, all of Clarksburg.

The West Virginia Coal & Coke Co., which has a number of mines in northern West Virginia, has been successful in starting operations at its mine at Bower on the Charleston Division of the Baltimore & Ohio.

Price and production representatives of Secretary Hoover in the smokeless territory are **E. E. White**, of Glen White, chairman and representative of the Winding Gulf field; **W. C. Atwater**, of New York, for the Pocahontas field; **William McKell**, of Glen Jean, for the New River field; **C. C. Morfit**, for the Tug River field. **George Wolfe**, of Beckley, is secretary of the committee.

William McKell, of Glen Jean, president of the McKell Coal & Coke Co., spent a few days in Washington late in May, being in attendance at the price conference held there.

H. V. Ingham, superintendent of the Howard Colliery at Chattaroy, has resigned. He will be succeeded by **Will Davis**, who for a year or more has been connected with the South Williamson plant of the Norfolk & Western.

In order to prevent a recurrence of an attack by a mob such as that to which their employees were subjected on May 31, several companies in the upper Potomac region are preparing to institute legal action. Employees of the **Brair Mining Co.**, **Allegheny Coal Co.**, **Piedmont & Georges Creek Co.**, and the **West Virginia Pulp & Paper Co.** were set upon and attacked while on their way to work near Piedmont and Luke. The day after the attack operators held a conference with a view to taking the necessary steps to bring those who participated in the attack to account, inasmuch as many members of the mob are known. The West Virginia Pulp & Paper Co. does not mine coal for commercial purposes, but to keep its large pulp and paper plant in fuel.

Phil Williams, general manager of the Randolph Colliery Co., with headquarters at Elkins, has returned from an extended Eastern business trip, Mrs. Williams and their son accompanying him.

Spates Brady, of Elkins, president of the Mable Coal Co., Brady Coal Co., and other concerns, with headquarters at Elkins, has returned from a visit to his plant in the Upper Potomac.

The Seneca Coal Co., with a plant on the Baltimore & Ohio near Philippi in Barbour County, has resumed operations, after a shutdown lasting from late in 1920.

The Beelick Knob Coal Co., of Cleveland, has been granted permission by the Secretary of State of West Virginia to do business in this state.

BRITISH COLUMBIA

In the Crow's Nest Pass field the strike is still under way and there is no prospect of an early settlement. If anything, the employers and employees are further apart than ever. The output from this district for May therefore was negligible. On Vancouver Island lack of demand has enabled the mines to work only part time.

Vancouver Island May Production

Mine.	Tons.
Western Fuel Corp., Nanaimo	35,840
Canadian Collieries (D) Ltd.,	
Comox	26,299
Extension	16,229
South Wellington	6,193
Granby Cons. M. S. & P. Co.	19,458
Nanoose Wellington Collieries	4,860
Old Wellington Colliery	574
Total	109,453

WASHINGTON, D. C.

Although it decided a large number of coal cases during its term just closed, the Supreme Court did not reach several other coal cases and these will be on the docket for argument when the court reconvenes in October. The cases pending are: **Corona Coal Co.** vs. the Southern Ry., from the District Court for the Northern District of Alabama. **Hillsboro Coal Co.** vs. the U. S. District Attorney, from the District Court for the Southern District of Illinois. Colonial Beach Co. vs. the **Quemahoning Coal Co.**, from the Circuit Court of Appeals, Fourth Circuit. **Porto Rico Coal Co.** vs. W. H. Edwards, collector, from the District Court for the Southern District of New York.

In a House debate, Representative Huddleston, Alabama, opposed the purchase by the government of the Cape Cod Canal, as recently recommended by the House Interstate Commerce Committee. He said although the promoters of the canal said it would save 10c. a ton on coal, the project had failed as a commercial enterprise, and the government should not take it over.

Traffic News

The Illinois Coal Traffic Bureau has been authorized by the I. C. C. to intervene in the complaint of the **West Kentucky Coal Bureau**, which involves rates on coal from mines on the L. & N. in western Kentucky to points in the North and Northwest.

The Indianapolis Chamber of Commerce has been permitted to intervene in the complaint of the **Indiana State Chamber of Commerce**, which involves the rates on bituminous coal from Ohio District No. 8 and Inner Crescent Groups to Terre Haute and other Indiana points.

The commission has denied without prejudice the application of the C. & O., to dismiss the complaint of the **Kanawha Black Band Coal Co.**, which relates to rates on coal from mines of the coal company on the Kanawha Central to various points.

Substantial reductions in freight rates on coke from Sunnyside, Utah, to Silby, Cal., have been announced by the **Western Pacific R.R.** The reduction brings the rate from $8.75 to $6. Sunnyside mines which are owned by the Utah Fuel Co., have been important suppliers to the industrial concerns of California, but the high freight rates of late have enabled foreign competition to prove formidable competitors.

The Lens Creek Coal Co., the **Left Fork Coal Co.**, and the **Halstead Coal Co.**, Kanawha County, W. Va., have filed a complaint with the Public Service Commission of West Virginia against the West Virginia & Southern R. R. In the complaint, it is charged that the railroad company established a rate for freight and passengers, and established rules and regulations governing same, that are excessive, unreasonable and burdensome on complainants, and that defendant company filed with the Public Service Commission a list of rates, rules and regulations for freight and passenger service, Nov. 6, 1920, which is an excessive, unjust and unreasonable rate, and the rules and regulations therein as to minimum and maximum weights and capacity for carload shipments, and other regulations therein contained, are unjust, unreasonable and excessive, and also said list is insufficient in that it does ont include the rates on explosives and other commodities shipped over its rails.

The Tampa Coal Co.'s complaint relating to rates on coal from points in Alabama to Tampa, Fla., because of increases applied under General Order No. 28, has been dismissed, on request of the coal company. Like action has been taken in the complaint of the Central Cypress Co., relating to rates on coal from points in Kentucky and Alabama to Centralia, Fla., and in the complaint of the Central Iron & Steel Co., relating to rates on bituminous coal from mines in West Virginia to Harrisburg, Pa., during Federal control.

A short section of the abandoned Chicago & Indiana Coal R.R. between Brazil, Ind., and West Union, Ind., has been purchased by the Cincinnati, Indianapolis & Western R.R., formerly known as the Cincinnati Hamilton & Dayton.

In the complaint of the **Fairfield Lumber & Coal Co.**, the I. C. C. decides that the rates on coal from Bankhead to Fairfield, Ala., and from Dora and Carbon Hill to Pratt City, Ala., during Federal control were not unreasonable.

In the complaint of the **Fox Paper Co.**, the I. C. C. has decided that the rates on coal from Seelyville and Big Vein, Ind., to Rialto and Crescentville, Ohio, are unreasonable.

Association Activities

Central Pennsylvania Coal Producers' Association and Central Coal Association

Both the Central Pennsylvania Coal Producers' Association and the Central Coal Association held their annual meetings in Altoona early in June. Officers were elected and action was taken with reference to price regulations in accordance with the request of Secretary Hoover.

The Producers' association met first and took up the request of Hoover that the district appoint a committee to confer with him on a price agreement between operators as individuals and the secretary. A tentative committee composed of H. J. Meehan of Johnstown, G. Dawson Coleman and Charles O'Neill, had been appointed by the board of directors previously. The association added the names of Allen Dodson of South Bethlehem and D. T. Price of Johnstown to this committee. They will go to Washington later to confer with Mr. Hoover.

The association then elected the following as members of the board of directors: T. H. Watkins, New York; R. R. Summerville, Winburne; Woodland Deringer, Spangler; Fred B. Kerr, Clearfield; W. R. Craig, Clearfield; H. J. Meenan, Johnstown; J. S. Sommerville, Robertsdale; M. J. Bracken, Johnstown; Rembrandt Peale and Charles A. Owen, New York; G. Dawson Coleman, Philadelphia; D. T. Price, Johnstown; G. Webb Shillingford, Clearfield; I. A. Boucher, Beaverdale; W. S. Blaisdell, Punxsutawney; James H. Allport, Barnesboro; Thomas V. Gould, Brisbin; James B. Neale, Minersville; J. William Wetter, Philipsburg; S. T. Brown, Indiana, and C. Law Watkins, Cresson.

The board organized by electing the following officers: President, C. Law Watkins; vice-president, R. S. Sommerville; chairman of the board, G. Dawson Coleman; secretary, Charles O'Neill; statistician, W. A. Jones; general counsel, A. M. Liveright, of Clearfield.

The Central Coal Association, which is composed of union operators of the district and which deals with the labor situation, held its annual meeting at the close of the meeting of the Producers' association. President G. Webb Shillingford, in his annual address, said that he does not anticipate that a settlement of the strike will be effected before Sept. 1, and he declared that the new scale must be based upon the economic and competitive conditions affecting central Pennsylvania exclusively.

The association elected the following executive committee: Woodland Deringer, Spangler; C. Law Watkins, Cresson; Charles A. Owen, New York; John B. Neale, Minersville; R. H. Sommerville, Winburne; S. T. Brown, Indiana; T. H. Watkins, New York; H. J. Meehan, Johnstown; J. S. Sommerville, Robertsdale; Fred B. Kerr, Clearfield; G. Webb Shillingford, Clearfield; I. A. Bucher, Beaverdale; J. William Wetter, Philipsburg; James H. Allport, Barnesboro; Thomas V. Gould, Brisbin.

The board afterward organized by electing the following officers: President, G. Webb Shillingford; vice-president, S. T. Brown; secretary, Charles O'Neill; statistician, W. A. Jones.

Publications Received

The following-named publications, which have recently been issued, are obtainable from the Bureau of Mines, Washington, D. C.

Serial 2343, Bibliography of articles relating to the preservation of mine timber.

Serial 2345, Relation of accidents and disease to the coal mining industry.

Serial 2349, Fatalities at coal mines in March, 1922.

Serial 2353, Explosives used in March, 1922.

Third Annual Report on the Mineral Resources of Alberta, 1921. By John A. Allan, University of Alberta, Edmonton. Pp. 72; 6 x 10 in.; illustrated. This report deals with the geology of the Drumheller coal field and is accompanied by a geological map in six colors, profile sections, stratigraphic sections, sections of the coal seams in each of the mines and photographs showing geological and topographical details.

Complete Uniform Accounting System for Retail Coal Merchants. National Retail Coal Merchants Association, South Penn Square, Philadelphia, Pa. Pp. 24; 6 x 9 in. This gives a very comprehensive system for keeping track of all the phases that apply to retail coal accounting.

Obituary

J. Newton Lambert, president of the Lambert Coal & Coke Co., Indianapolis, died recently at his home after an illness of several months. He was born in Warren County, Ohio. He came to Indianapolis eighteen years ago, associating with his son, C. L. Lambert and Rice W. Lambert, a grandson, in the business which bears his name.

Francis J. Rocks, aged 57, died early in June at the Uniontown Hospital following an operation. Mr. Rocks at the time of his death was president of the Nicholson Coal Co., and the Ainsley Coal Co. He became prominent in the trade as organizer and president of the Sunshine Coal & Coke Co.

W. G. Block, Muscatine, Ia., business man and president of the W. G. Block Coal Co., died at his home there recently, following a brief illness. Mr. Block was 73 years old and had lived in Muscatine practically his entire life. The concern of which he was the head has a number of branch offices, one being located in Davenport.

Richard Davis, widely known in western Pennsylvania as a mining engineer, died early this month in Pittsburgh at the home of his son.

Coming Meetings

National Safety Council. Eleventh annual Safety Congress at Detroit, Mich., Aug. 28 to Sept. 1. Executive secretary, W. H. Cameron, North Michigan Ave, Chicago, Ill.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

Mine Inspectors' Institute of the United States of America will hold its annual meeting July 11, 12 and 13 at Chicago, Ill. Secretary, J. W. Paul, 4800 Forbes St., Pittsburgh, Pa. Announcement regarding headquarters will be made later.

Coal and Industrial Exposition under the auspices of the Huntington Chamber of Commerce will be held Sept. 18-23 in the Chamber of Commerce Bldg., Huntington, W. Va. **The West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers** will again hold its annual meeting in the same building during the exposition.

National Exposition of Chemical Industries will hold its eighth national exposition at the Grand Central Palace, New York City, Sept. 11-16. Manager, Charles F. Roth, Grand Central Palace, New York City.

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, Editor

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Resumption in Anthracite Field Awaits Pressure of Public

ANTHRACITE will be in short supply next winter even though the hard-coal miners return to work on July 1. There is no overcapacity at the hard-coal mines to make up the three months' output now lost. The miners will consider no reduction in wages; the operators ask that they take a reduction. The operators have offered to arbitrate. The miners have refused. The deadlock is complete. There is nothing left save for the consumer to force arbitration.

Leaving out of consideration the war years 1917 and 1918, the average annual production of anthracite from 1914 to 1921 was, in round numbers, 88,800,000 net tons, in which is included mine consumption and local sales. This represents an average of 7,400,000 net tons per month. The lowest year in that period was 1916, with 87,578,000 net tons; the highest, 1914, with 90,822,000 tons.

No anthracite has been produced for three months. In the first three months of 1922 the total production was 21,780,000 net tons, an average of 7,250,000 tons per month. When the strike began householders had less coal than usual in their cellars, and dealers had but little if any more than the normal quantity in their yards. Producers were in possession of somewhat larger tonnages on April 1 than they have had on that date in any other year since 1917. Giving the most liberal interpretation to the incomplete data available on hard-coal stocks as of April 1 leads one to say that at the outside not over 6,000,000 tons was being held by producers, dock owners and retail dealers. Of this by far the larger portion was pea and smaller sizes. The whole represents less than one month's production. A considerable portion of this has already been delivered and consumed, particularly the steam sizes. Outside of cellars and retail yards almost no hard coal in sizes larger than pea is now above ground. The first two weeks of cool weather in September will clean up the yards. Were perfect distribution possible the total available supply of domestic sizes, delivered and yet to be delivered, would be barely sufficient for the first few weeks of cool, coal-burning weather.

A conservative estimate of bare requirements for new production of hard coal in the nine months between July 1 and March 31 next is 85,000,000 net tons, an average of 9,400,000 tons per month. In no single month in the past nine years has that output been attained and in but seven scattered months during the war was 9,000,000 tons reached. Were the anthracite miners to return to work on July 1, and to produce at the rate of 9,000,000 tons per month for the ensuing nine months, the country would even then be short 4,000,000 tons. No such rate of output can be reached and maintained, however, and therefore the immediate prospect is for a shortage of from five to ten million tons.

In September, 1920, because of "outlaw" strikes in the hard-coal regions in protest against the wage award of the President's commission, production was reduced to 4,638,000 net tons, a drop of but 3,400,000 below the season's monthly average. This apparently small deficiency was sufficient to disrupt distribution, to send householders' prices to heights entirely out of reason and to create a situation the repetition of which no one desires. At the present rate of progress in getting the miners back to work, next winter will witness a situation for the householder more serious and prolonged than that in 1920.

Negotiations looking to a settlement of wages for this year were begun by the operators and hard-coal miners on March 15. After two and a half months these efforts were abandoned because the miners would not recede an inch from their demands for a 20-per cent increase in wages and changes in working conditions that, according to the operators, would have called for an increase in the cost of domestic sizes of hard coal of $3 per ton to the householders. On June 2 the operators asked the miners to submit their differences to the President for arbitration. This also the miners have refused.

It is obvious to all informed observers that President Lewis of the United Mine Workers and the policy committee of the union have no intention of permitting the hard-coal strike to be settled until the strike in the bituminous-coal fields also can be composed. Their chance of winning each is enhanced by having both out. It is true that the hard-coal miner is less disposed to accept a decrease than the miner in the soft-coal fields and that a decrease will be more acceptable in the anthracite region when it is apparent that the others have or will have a lowered wage scale. But this can be no reason for refusing the operators' offer of arbitration.

It is time for real pressure to be brought on the miners in the anthracite fields to get to work. That pressure now can come only from the public, which will otherwise be made to suffer for lack of coal. If the consumer wants hard coal this winter and wants it at a lower price than during the past two years, let him raise his voice so that the United Mine Workers can hear it. If the administration at Washington has any interest in the situation let it say so.

C'est la Strike!

CONSEQUENCES serious enough to satisfy the most exacting will be the product of the coal strike if it lasts long enough without laying at its door every cold a citizen catches. Last week the Interborough Rapid Transit Co., the main transportation system of New York City, suffered a breakdown in the busy hours of the evening. The coal strike was promptly blamed.

It appears from the report of the engineer of the State Transit Commission who investigated the incident that the company has three 30,000-kw. turbines, of which two were out of commission at the time, that the third broke down, and that when an effort was made suddenly to put the entire load on old reciprocating auxiliaries, it was not possible at once to produce the extra steam. The engineer, Mr. Latey, reported: "The direct cause of the shutdown was the failure of a 30,000-kw. unit. . . . It is difficult to state positively whether or not the fact that the Interborough is now using coal below their usual high-grade standard had any important bearing upon this trouble, but there seems no doubt that some of the coal is of an inferior quality. . . . It may therefore be assumed that the use of some of the inferior coal had at least an indirect bearing on the difficulty."

A mechanical breakdown, some inferior coal that may have some indirect bearing on the temporary lack of power and a natural tendency to pass the buck result in universal headlines blaming the trouble on "coal shortage." The *Tribune* editorially calls it the first "shadow" of the strike and makes it the occasion for a new demand for intervention by the administration. Will these folks ever learn to distinguish between hard and soft coal?

A Peaceful Strike and Why

SOUTHERN Illinois has answered the question so often put, Why have we been enjoying so peaceful a strike?

Have the mine workers become suddenly little disposed to riot? Not at all. To begin with, there has been quite a little promiscuous dynamiting, men have been intimidated and some shot, but not in such degree as to excite the national newspapers sufficiently that they would give the stories frequent and extended space. Long ago it was recognized that the blowing up of a single house or of a small mine is not worth recording and that the killing of a man or even two or three is entitled to only an inch of space in a daily.

At last southern Illinois has put the coal strike on the front page of every newspaper. The disorder, it is recognized, arises from the attempt of the Southern Illinois Coal Co. to operate its mines. Other plants in well-organized districts have made no such attempt. Some have even nailed up their mines and ceased even to ventilate or pump them. Should the operators change their plans and decide to open up their plants, as the law allows and the public demands, violence would break loose immediately.

The men who would undertake to work and the men that directed them would be used, as John L. Lewis would say, "as strike breakers." Murder, torture and dynamiting would follow. The peace we have had has been the *pax Romana*, a thing not of principle but of force and not of lawful force but of anarchy. The domestic order that exists represents not forebearance on the part of the mine workers but the willingness of the operators to lie down and take what the union gives them and to forego their rights under the law.

Are We Losing a Sense of Fundamentals?

AWAY back in 1826 a branch of an organization known for its humanitarianism was alleged to have abducted and murdered one of its faithless members. Few are left to remember and few even recall the excitement resulting. For years there was a party in this country the tenet of which was suppression of the whole organization, a branch of which had killed this one man, William Morgan. Eventually the agitation died down, as well it might. The episode is omitted from most histories. We mention it here only to show how the American people reacted to a single murder in the days when this was practically a closed land—100 per cent American by actual birth.

Admixture of a horde of unassimilated, and but slowly assimilable, foreigners of the lower class has made a change in America. The public talks of Americanization of aliens as if there was no recollection of the fact that America has been largely de-Americanized. The affair in southern Illinois brings the fact painfully before us that even those whose background through generations is undoubted, no longer have the keen sense of the evil of murder that was carried almost to a fault in 1826. The union, which through its local membership in and around Herrin tortured and shot and hung men by the dozen, is not in any way abashed. It is suggested that other men are to blame, at least in a sense. The operators should have done again in contempt of court what they already have been indicted for doing. They should have formed a combination with the mine workers which would have maintained wage scales. Thus combined, prices would have been kept up to a level that would have made it possible to pay wages three times as high as are paid to men of like intelligence and ability in other lines of work.

The State of Illinois has rightly decided not to send troops into Williamson County. The time of citizens should not be wasted in *opera bouffe*. There is no intention to preserve the inherent right of any man to work for whom, where and whenever he pleases. No one purposes to enable those who own mines to operate other than at their peril. There is no wish to afford the public coal so long as the union continues to deny the right of any and every one to mine it. No one would bring the murderers to justice were the militia to go to Herrin. Witnesses do not need protection, for there must be no witnesses. The militia is not needed for apparently no one is intending to disarm the murderers. Only if the operators try to operate, only if the workmen try to work, will there be trouble, and after this tragic affair we may be assured no attempt will be made. It is settled that there is a greater power than Springfield or Washington—the United Mine Workers of America.

According to the newspapers only one Cabinet officer has spoken. Would he had kept quiet, for he declares, if he is rightly quoted, that if only the union demand for an interstate contract of doubtful legality had been conceded and the public been made to pay through the nose, then the union would have been appeased and the massacre would not have occurred. And Secretary Davis voices a quite general sentiment. Well indeed would it be if we could get back to the spirit of 1826.

Plant in Iowa Picks Its Coal Clean Before Weighing

Coal Fed to Picking Table Car by Car, Lumps Being Delivered Above Slack—By Single-Roll Crusher Coal Can Be Delivered as All Egg and Slack or as Slack Only

BY M. W. HIBBARD*
Columbus, Ohio

INSISTENCE on the quality of coal to be mined by employees cannot have satisfactory results unless the weight of clean coal mined by each employee is made the basis for payment. Much has been left in the past to the judgment of the docker. He surveys the coal on the top of the car, he watches it going down the chute, he may note with his eye how much is taken off at the picking table, but when all is done he must make a guess, and that guess is subject to criticism. If, however, the dirty coal is picked and the coal remaining weighed, the miner feels satisfied that at any rate the company is not profiting by the dockage. The coal declared bad, if not up to the standard, has been lost both to the company and to him, and there is no doubt as to the quantity of that part of his coal which is sent to market. Thus is much question removed. Every man is docked; some imperceptibly, others much. No discrimination is possible. The weight tells the story, and everyone is satisfied.

Such an arrangement has been built into its tipple by the Shuler Coal Co. at its mine at Waukee, Iowa, where that company has an area of 6,000 acres of coal land at a depth of 450 ft. below the surface. This coal is reached by a 10 x 13-ft. shaft. In making its plans the company sought to put the coal over picking or docking tables so that the slate or refuse could be picked out before the coal in each car was weighed and placed on the shaker screen. In order to accomplish this the product of the mine is hoisted in self-dumping cages to a point approximately 56 ft. above the track level, where it is dumped into receiving hoppers that are so arranged as to pass the contents of coal cars to feeder hoppers or to deliver material from slate cars directly to the slate bins. The receiving hoppers are each capable of handling somewhat more than a car of coal and are so arranged that they place the coal of each car on the picking tables with an intervening space after each carload. Consequently each car can be identified.

The feeders are made of two strands of steel thimble roller chain with flights 48 in long and 42 in. clear space between the skirt boards of the feeder. They operate at a speed of 36 ft. per minute. This gives a nominal capacity of 175 tons of coal per hour for each feeder. The coal from the feeder passes to a picking table so arranged as to put the slack in the bottom and the larger lumps and refuse on top.

Picking tables are made of two strands of steel thimble roller chain, equipped with pans 72 in. long, and operate at a speed of 50 ft. per minute, spreading the coal out to an average depth of approximately 8 in., which is that best suited for picking.

The refuse from the picking tables is passed by means of proper spouts to slate bins alongside the shaft, and is taken by cars from the bins to the refuse pile. The coal is passed into a 3-ton weigh hopper, where it is weighed and then dropped into the feeder hopper which is located above the shaking screens.

FIG. 1. LOADING BOOM ADJUSTED BY ELECTRIC HOIST

The lump loading boom, which is the one shown, can be raised so that it will discharge coal to a cross conveyor which fills the bin in which coal is stored for local consumption.

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*Manager, engineering construction, the Jeffrey Manufacturing Co.

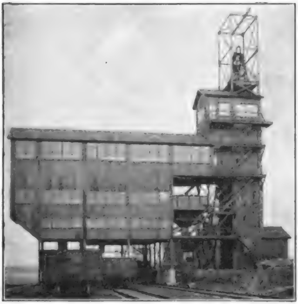

FIG. 2. TIPPLE LOOKING DOWN RAILROAD SIDETRACK
An all-steel structure. The window sash and girths are all of steel.

These feeder hoppers have a capacity of three cars of coal and are equipped with a plate feeder arranged to discharge coal at a rate of 350 tons per hour to the shaking screens immediately below the picking tables, as shown on Fig. 4. The upper shaker is 19 ft. long by 6 ft. wide and is equipped with a screening surface made up of cross-lip screens. All the slack passing through this screen is discharged into cars on the slack track. Any leakage of slack at the reciprocating feeder is collected in the slack hopper and passed on to the same track. The screened coal passes to the lower shaker, which is 6 ft. wide by 19 ft. long, so arranged as to load egg to the inside track and lump to the third track.

Provision is made for the diversion of the coal, if so desired, to a single-roll crusher which can reduce the entire output of the mine to a predetermined size and load it on the egg track or the slack track.

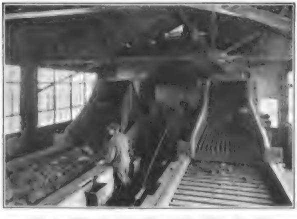

FIG 3. PICKING TABLES: LUMP COAL ON TOP
The plant is so contrived that the coal from each car can be picked separately from the coal of any other car and the clean coal also weighed separately. Thus the miner is paid only for clean coal.

These screens are entirely of steel construction. They are suspended on hanger rods from the framework of the building and are operated at a speed of 100 r.p.m. by a 20-hp. motor, belted to a jack shaft. The egg and the lump coal are not loaded directly into cars, but are passed to loading conveyors equipped with raising and lowering booms, operated by an electric hoist. Thus the coal is loaded into the car with minimum breakage, and by raising the boom to the proper height the car can be topped out with little labor.

The loading booms are made up of two strands of steel thimble roller chain of 9-in. pitch and 48 in. wide. They operate at a speed of 50 ft. per minute. They are of standard Jeffrey design with extended side bars on the chain to form the ends of the moving table, and with beaded and curved discharge flights. The hinged and counterweighted booms are fitted with electric hoists by which they are controlled from the loading point.

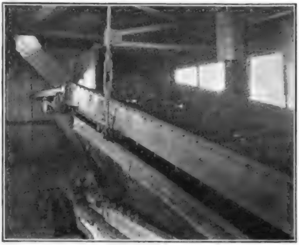

FIG. 4. SHAKING SCREEN WITH FEEDER
The coal after weighing slides into a feeder hopper which has a plate feeder arranged to discharge 350 tons per hour to the shaking screens.

The lump-loading boom also is arranged so it can raise the coal to a higher level, where it can discharge its load into a cross conveyor which fills the bin which provides coal for local consumption.

The construction is rugged and heavy throughout, the steel framework of the building being amply proportioned. The picking and screen floors are lighted by steel sash windows in steel girths. The building is covered with corrugated iron.

In the tipple every care has been taken to reduce the breakage of coal by providing for its easy passage from point to point. Provision has been made for careful inspection and picking. By the use of individual motor drives, ample access to working parts, walkways and stairways to every working point, the tipple can be operated with a minimum amount of labor. All valves for the passage of coal and slate are counterbalanced so as to be operated with minimum labor.

The single-roll crusher has given good service in breaking down the large-size, hard Iowa coal to the size required by the railroads and the consumers for proper consumption. At several of the Iowa mines 350 to 400 tons per hour have been reduced from mine-run to stoker size in one operation.

The Case for Purchased Power at Coal Mines*

Load Factors Unusually Low in Illinois—Purchased Power at Kincaid Mines Costs 5.43c. per Ton—Consumption 2.40 Kw.-Hr. for Each Ton Mined—Water Scarcity Is Big Problem in Middle West

By J. Paul Clayton†
Springfield, Ill.

From its very beginning the industry of generating and distributing power to industrial plants has developed rapidly. Only about twenty years ago power companies first commenced to build relatively large stations. With these large establishments far greater economies in production were obtained than with the small stations originally put into service. At the beginning of this century the managers of central stations quite generally assumed that it hardly would be possible to sell power to the coal mines in competition with the coal operators' own plants, arguing that the coal mines had their own coal on which they did not have to pay freight, whereas the central-station plants consumed coal for which a large freightage charge had to be paid whenever the station was located at a distance from the mines. It was soon found, however, that the advantage which the coal mine had by virtue of its low-cost coal was nullified at most mines by the inefficiencies of its power plant. Even where that plant was efficient, it was found that because of its small size and its low annual load factor the cost of power per unit was unduly high.

The West Penn Power Co., which operates in the vicinity of Pittsburgh, was one of the first central-station companies to demonstrate that coal mines could purchase power for much less than they could generate it in their own plants. This company, by supplying electric power to coal mines, gradually built up a business extending over a large area around Pittsburgh. It served from its central station a large number of communities and several coal mines, all from the same transmission system.

Mines, at First, Could Not Use Purchased Power

At first there were many practical difficulties in adapting central-station power to the various uses for which it was required in the mine. All the mining machinery which had been developed up to that time had been adapted to the use of steam, and types of steam hoists, steam pumps and steam engines for driving other machines, such as fans, had reached a high degree of perfection, both in reliability and in economy. A long period of experimental installation followed during which electric power was adapted to hoists, pumps, cutting machines and other auxiliary uses around the mines. It was not long, however, before the electrical equipment available for such purposes attained a satisfactory degree of reliability.

It must be borne in mind that there is a large difference between the power requirements of coal mines in the different coal fields of the United States.

For instance in the anthracite fields in eastern Pennsylvania as much as 10 to 14 tons of water must be pumped from the mine for each ton of coal hoisted. In such mines most of the power is steadily required for the pumping of water. Such mines frequently have an annual load factor exceeding 50 per cent.

In the bituminous mines of western Pennsylvania, West Virginia, Kentucky, Ohio, Indiana and Illinois the annual load factor will vary from 15 per cent to 35 per cent, depending upon the number of days of operation per year, the relative amount of water to be pumped, the quantity of air required for ventilation and many other conditions, each of which affect directly the final result.

It is, of course, apparent to every mine operator that if a mine in Illinois, for instance, operates one eight-hour shift per day for a total of 185 days per year, and has practically no water to pump, and consequently has an annual load factor of 20 per cent, the conditions of power supply of such a mine will vastly differ from those of an anthracite mine in eastern Pennsylvania with a load factor of 50 per cent.

In Illinois, with a coal production which ranks third in the United States, mines have been developed of large daily capacities, having conditions which give them an unusually low annual load factor. This combination makes power costs higher than they otherwise would be. Most of the mines sunk during the past six or seven years have daily outputs of from 4,000 to 6,000 tons per eight-hour day, and in consequence the power requirements are large, averaging for such mines from 1,000 to 1,500 kw.

Most of these are shaft mines, the shaft being about 400 ft. deep. In nearly all these mines the quantity of water to be pumped is negligible. Illinois coal cannot be stored for long periods without deterioration and this fact, together with the seasonal demand for domestic coal causes the production of coal to be unequally divided over the year. The average days operated

STANDARD SINGLE-CIRCUIT TRANSMISSION LINE
Power line on left of railroad is one of those belonging to the Central Illinois Public Service Co. It carries a 33,000-volt current.

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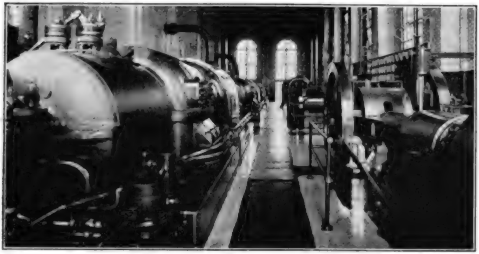
*Article entitled "Purchased Power for Coal Mines," read at the Illinois Mining Institute meeting on board the "Golden Eagle" on the Mississippi, June 9, 1922.

†Vice-president, Central Illinois Public Service Co.



Muddy Power Station

Near Harrisburg, Ill. This station has three large turbo-generators and auxiliary equipment. A 10,000-kw. turbine is being added, so that by September of this year the total capacity of the station will be 25,000 kw., thus making it the largest single steam-power station in the State of Illinois outside of Chicago and vicinity.

over a period of years is about 185, or roughly one-half the year.

The average annual load factor for mines in Illinois for the entire power requirements is for these reasons from 20 to 25 per cent. The low annual load factor and the fact that the maximum demand for power lasts only for eight hours at any one time and is followed by a low demand for at least sixteen hours thereafter, during which period most of the boilers must be banked, result in an extremely low boiler performance, even in a well-designed and modern plant.

The first use of central-station power at coal mines in Illinois began about ten years ago. Three new coal mines were then opened in central Illinois and arrangements were made to perform all operations by electric current furnished by the Central Illinois Public Service Co. That company has continued to develop this business until at the present time it provides all or part of the power requirements at fifty mines in that state. The largest of these has a maximum demand of about 2,200 kw. In the development of this business it has been conclusively proved that central-station power has the advantage in that it can be supplied to coal mines both large and small at a large saving over the cost of power generated at individual power plants. Other advantages might be mentioned.

The Central Illinois Public Service Co. has found that the power requirements of fully electrified large-capacity mines vary from about 2½ to 4 kw.-hr. per ton. The first and lower figure is attained where conditions are favorable and mines operate around 220 days per year. The larger power consumption is reached where less favorable conditions are presented and the mines operate around 150 days per year.

Table I gives the cost of purchased power for the year 1921 at the Peabody Coal Co.'s mines Nos. 7, 8 and 9, near Kincaid, Ill.

TABLE I. COST OF PURCHASED POWER AT THREE KINCAID MINES

Mine	Tons of Coal Produced	Days of Operation	Kw.-Hr	Cost of Purchased Power	Cost of Power Per Ton, Cents	Kw.-Hr. Per Ton
7	818,400	219	1,901,496	$41,116.26	5.04	2.33
8	767,852	209	1,950,600	47,525.81	6.10	2.55
9	585,286	236	1,350,200	29,222.48	4.98	2.31
Total	2,171,538	664	5,202,296	$117,864.55		
Average	723,846	221.3	1,734,099	$39,288.18	5.43	2.40

This Kincaid tabulation shows that for these three mines, which have maximum daily outputs of around 4,500 tons per day, the cost of purchased power per ton for all requirements averaged 5.43c. per ton and that the power consumption averaged 2.40 kw.-hr. per ton. It is not believed that any mine in the State of Illinois operating its own power plant has a cost for steam power as low as this cost for purchased power, based upon the same operating conditions as to tonnage of coal produced, number of days operated and other similar conditions. In fact the power costs of many of the more modern steam-power plants of mines in Illinois of similar outputs range as high as from 10c. to 15c. per ton.

USE 2.4 KW.-HR. PER TON OF COAL PRODUCED

In the above mines, which use 2.4 kw.-hr. per ton for all of their power requirements, we find that approximately one-third of this power is used for hoisting, the average hoist in these mines being around 450 ft.; one-third is used for haulage and cutting, and one-third is used for the fan, pumping and miscellaneous motors in the tipple.

The mines served by the Central Illinois Public Service Co., which purchase power for haulage, cutting, and for driving some small motors, use as an average from 1 to 1.2 kw-hr. per ton for these purposes.

It will be appreciated, of course, that the power requirements of individual mines vary considerably. Some of the causes for these variations are presence or absence of heavy grades on haulage roads, quantity of water to be pumped, average distance of working face from shaft, type of cutting machine used, type of hoist installed, size of fan, and use of mules or electric power for gathering. It is possible, however, to predict with reasonable accuracy the power requirements of a given mine from other mines located in the same field where approximately similar conditions exist.

The purchased power required for the operation of a part or all of a mine's requirements can be predicted with greater accuracy than can the cost of operating a power plant at the same mine. The cost of operating steam power plants for mines varies greatly even with about the same equipment installed, whereas in the case of purchased power the efficiency of similar types of apparatus is almost always about the same and nothing is likely to cause a serious loss in efficiency such as may easily occur in a steam power plant inefficiently operated.

The principal advantages which mine operators gain from purchasing power have been found to be as follows: (1) Reduction of initial investment in power-generating equipment. (2) Ability to increase capacity to almost any extent on short notice. (3) Independence of water supply. (4) Reliability of power supply during strikes. At some mines with privately owned power plants the workings have been flooded during a strike because the men who ran the power-plant refused to work. (5) Reduction of time required during the year for repairs to power apparatus. (6) Ability to locate motor-generator sets and transformers near the working face instead of in the power plant above ground. (7) Large reduction in power costs per ton of coal mined.

One of the greatest advantages in purchasing power is the ability which it affords for increasing the quantity of power delivered at any time upon short notice. Many steam power plants at the mine have been built in such a way that extensions are difficult or expensive to make, whereas the capacity could be increased at little cost if purchased power were used.

Many mines in Illinois are located in places where an adequate water supply can be obtained only at a prohibitive cost. In other places the water which can be obtained is of such a poor quality that the cost of maintenance of the boilers would be excessive. Many mines in Illinois run short of water during the summer and have to haul it in tanks at an extremely heavy expense. Cases have occurred where the hauling of water for a few months in the summer has cost more than the entire annual power bill would have been if power had been purchased. Purchased power practically obviates the necessity for investing any money in a large permanent water supply, except where the coal has to be washed.

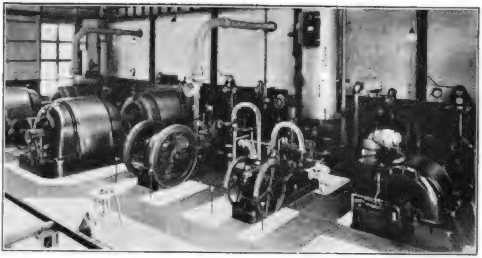
Up to the time when purchased power was available in Illinois it was the universal practice to generate direct current in the power plant and use large direct-current feeders to carry power for haulage and cutting to the working face, even though this might be from one to two miles from the shaft. When purchased power was introduced it was found to be feasible to take 2,300-volt energy in lead-covered armored cables into the mine, either through the airshaft and along the entries or through a drillhole near the face, and thus supply the motor-generator sets for electric haulage and transformers for alternating-current cutting machines.

This resulted in saving a large investment in direct-current copper feeders, which had been required with the former method of operation. This advantage is inherent in the purchase of power from an alternating-current source, and the existing mine power plants cannot obtain the advantage of this method of power distribution unless they install new alternating-current generating equipment. This would involve a capital expenditure larger than that invested in their present installations.

The great operating advantage of this arrangement is that it provides good voltage for the locomotives directly at the place where it is required, and thus avoids the low voltage which constantly troubles mines using direct-current distribution for long distances, unless, indeed, an enormous investment is made in direct-current feeders. This method of furnishing power has given additional life to many old operations in Illinois which were about to be abandoned, and it has greatly increased the output of other mines where it could not be increased, using the existing power plant with direct-current feeders, except by making an extremely large investment Similar advantages can be obtained

CENTRAL POWER STATION AT KINCAID, ILL., LOCATED ALMOST AT THE GEOGRAPHICAL CENTER OF THE STATE

This plant has three alternating-current turbo-generators with a total capacity of 6,000 kw. Its Babcock & Wilcox boilers generate 3,000 hp. Energy is supplied to main transmission line connecting Kincaid with Matoon, Terre Haute, Hamilton, Hulls and Beardstown.



Kincaid Station

Showing steam turbo-generators and auxiliary equipment. One of the twenty-four general stations of the Central Illinois Public Service Co., with headquarters at Matoon, Ill.

by many mines now operating with a power supply at the face inadequate for haulage and cutting, and these benefits can be obtained by the mine for a smaller initial investment and for a lower operating cost by purchasing power than by any other method.

A completely electrified mine in Illinois of large capacity which purchases its power will have a power expense much less than with the average individual power plants now operated by mines. These savings in power cost vary in the average mine from 5 to 10c. per ton and even when compared with the cost obtainable from the use of the highest type of individual power plant these savings will amount to from 2 to 5c. per ton.

We are again in the days when such savings as 5c. per ton in the power supply may mean the difference between a profitable mine and an unprofitable one. In fact purchased power in many cases has effected savings which enabled a mine to continue in operation in competition with larger mines far beyond the time when it would have had to be shut down as unprofitable if it had continued to generate its power by an individual plant.

WHY BUY BACK POWER OF THE COAL YOU SELL?

Many people naturally ask how a central station can manufacture power from coal purchased from a mining company at a profit to the latter and still be able to sell this power back to the coal mine at a price which represents a profit to the power company and a saving to the mining company.

The answer to this question is contained in the following advantages, which form the economic structure upon which the central-station business is built: (1) Concentration of production in a very large station, with resulting high economies in the use of fuel. (2) The diversity factor which exists between a great many individual loads, which results in the central-station system as a whole being operated at a high load factor. (3) Diversification of the loads of coal mines with lighting loads and other loads that occur at different times of the day, which still further tends to increase the total load factor of the station.

In coal-mining regions where mines work only one-shift per day, generally between the hours of 7:30 a.m. and 4 p.m., the peak loads of the coal mines never occur at the same time of day as the peak loads resulting from electric lighting. This enables the central station to utilize the capacity of its station and transmission system in the daytime for the coal-mining load and after 4 p.m. for the lighting load, with the result that many such companies have load factors upon the entire system of as high as 45 to 50 per cent for the separate coal mines served by this system.

The modern large steam-turbine condensing stations with load factors as high as 45 per cent can produce power at an expenditure of from 2 to 4 lb. of coal per kilowatt-hour as compared with 4 to 6 lb. for the best possible mining plants up to the 10 or 20 lb. of coal which is used in many mining plants.

MINE RELIEVED OF HEAVY EXPENSE FOR APPARATUS

The Central Illinois Public Service Co. serves several individual mines, which in consequence have annual savings in power costs of $30,000 or $40,000 per year per mine. Not only are savings in operating expenses of this kind obtained but the same mines are thereby relieved of an additional investment of at least $250,000 for power-generating apparatus.

The primary purpose of a coal mine is the mining of coal and not the production of power. Almost all the official personnel in a mining company consists of men who have worked their way up in the mining profession and who are not specially interested or trained in the economical production of power. Where a mine generates its own power it really has two industries to operate—one the mining of coal and the other the production of power. Most of the mines which have purchased power have found that they were able to increase the production of coal in consequence, because the entire attention of their organization could be put directly to the mining of coal.

The production of power has grown to be a great industry of itself, and it has reached a high degree of efficiency only because it has concentrated that large production in one system under the direction of men whose entire efforts are devoted to the economical generation and distribution of power.

The comparative youth of the central-station industry and its rapid development, especially in the supply of power to coal mines, gives promise that a time will soon come when no mine will generate its own power. In many regions today as many as 90 per cent of the coal mines are now purchasing current for all their power requirements.

Views of Mechanical Engineers in Wyoming Valley as to Proper Care and Upkeep of Boiler Furnaces

Anthracite Boiler Practice Inefficient—Some Plants Install Dutch Ovens—Combustion Arches Increase Temperature and Steadiness of Heat—Large-Size Fuel May Ruin Arches—Water Softening Much Needed—Some Find Fireclay Makes Good Mortar

ASSEMBLED BY D. C. ASHMEAD*
Kingston, Pa.

UNTIL a comparatively recent date no one considered it of great importance how much or how little coal might be consumed in the power plants of the anthracite region. As the price of anthracite coal began mounting, however, fuel expense became of greater importance each year. A review of the present status of boiler-furnace practice in the Wyoming region may, therefore, be found of value to mine executives and mechanical engineers. For this reason I have obtained statements from the engineers in charge of the equipment of several of the large operating companies in the Wyoming Valley. The data furnished by each coal company will be presented separately in order to show the diversity of opinion that exists and the many different plans adopted for the conservation of fuel.

The engineer of one of the largest companies states: "It must be understood that in this region coal companies operate their boilers more inefficiently than does any other industry, in spite of the fact that the coal companies employ mechanical, efficiency and combustion engineers *ad lib.* Conditions, however, have changed somewhat during the past four years. The tremendous waste of fuel resulting from inefficient boiler operation is now realized, and all coal-company executives are keenly alive to the great value of the fuel burned in their boiler plants.

"The reasons for the former remarkable wastes in this department of coal mining are readily apparent. Originally boiler fuel was cheap and, being at the source of supply, was regarded as if it cost nothing. As a matter of fact only as recently as ten years ago, when making estimates intended to show the wisdom of an expenditure for improved equipment, engineers were not allowed to include an item for the cost of boiler fuel even at so low a figure as 50c. per ton.

SOFT-COAL RATIOS FOR HARD-COAL BOILERS

"Boiler manufacturers also were largely to blame. Boilers were sold for the burning of anthracite coal which were designed on soft-coal furnace ratios. Settings as a rule were low and in general no provision was made for the character of fuel to be burned. The coal originally used was No. 1 buckwheat or pea, but with the advance in the market demands for these sizes, the mining-company engineers made abortive attempts to burn finer grades in the same old boiler settings. The boiler manufacturers suddenly realized that their designs had far from kept pace with fuel requirements.

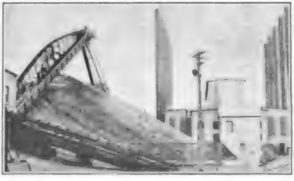
"With the expansion of mining, power demands became steadily more insistent. Instead of rectifying the difficulties which were inherent in the old-type settings, however, effort was directed toward burning more coal, no matter how inefficiently, on the small grate areas.

"With the introduction into the anthracite field of boilers of the Stirling type the advantage of refractory arches was demonstrated. Today few boilers are erected that do not have a refractory setting designed to burn fuel at a high rate per square foot of grate surface. Internal changes also were made, designed to increase the transfer of heat from the products of combustion to the heating surface.

"Old-style settings rarely developed a temperature in the fire box exceeding 1,800 deg. F. The heat in present-day practice will range from 2,600 to 2,800 deg. While the volume of heat is more essential than the intensity, the rate of combustion is so much greater at the higher temperatures that the results obtained justify their maintenance. These high heats are reflected in increased costs for boiler repairs. At the low temperatures formerly attained such repairs were small.

"During the period of the war—in 1919 to be exact—because of the great demand for steam sizes of anthracite, one company decided to rebuild all its boiler plants in order to burn finer grades of fuel, thereby releasing No. 1 buckwheat for the market. It did not desire to go into stoker operation, not so much on account of the capital investment as because of the length of time it would take to install the stokers. Also a large number of plants did not lend themselves readily to this revamping without being practically rebuilt. As a result instructions were issued to do the best possible with the equipment at hand. The fuel to be burned was barley.

"An experimental setting demonstrated the utility of extended furnace construction with baffling so arranged as to give a better diffusion of gases, without materially increasing the internal resistance of the boiler. The ratio of grate surface to water-heating surface adopted



EXTERIOR OF LARGE ANTHRACITE BOILER PLANT
Note the large pile of boiler coal such as in former days was regarded as utterly valueless but is now used for steam raising.

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*Anthracite editor, *Coal Age.*

Anthracite Boiler Room

Mechanism not only saves man power but does the work more regularly and acceptably. The fire is better spread and the admission of air is better controlled than with hand stoking. Coal that formerly covered the low lands and filled up the streams is now turned to a useful purpose. Before long the mines will hardly so much as color the waters which leave the anthracite region instead of forming, as in the past, large "sand bars" of merchantable coal.

for burning barley was approximately 1 to 27. A greater intensity of draft is required for this fine grade of fuel and as all plants operated under forced draft, the air space in the grate bars was reduced from 30 to 6 per cent. All stationary bars were discarded and dumping grates installed.

"This change greatly reduced the labor of the firemen and also lessened the losses arising from cleaning. Combustion arches were sprung across all furnaces, thereby increasing the furnace temperature and by virtue of the tremendous quantity of stored energy in the refractory arch, the boiler when the furnace is cleaned and coaled, will furnish its quota of steam within five minutes after the door is shut.

"The time that a boiler is normally out of service after cleaning without such a specially designed furnace is from 20 to 45 minutes, depending on the depth of coaling. The changes in construction briefly described above gave excellent results and cost approximately $2,000 per boiler.

"The higher temperatures developed caused no particular trouble. Contrary to the practice of some engineers, the fireboxes were laid up with a hard-burned medium ground firebrick, in four stretcher courses to one header. Instead of fireclay, high-temperature cement was used with good results. In this character of work the difference in cost between fireclay and cement cannot be considered, as the item of labor for repairs is more important than the cost of materials.

"All firebrick was laid up with a thin cement mortar, not brick to brick. After the setting was completed its entire face was washed over with two coats of diluted cement, the first being a mere wash and the second applied with a consistency about the same as that used in laying the brick. The tops of all arches were also protected by a mixture of asbestos and high-temperature cement wherever they were exposed to the return sweep of hot gases.

"The question of repairs on reconstructed settings is one of interest, with the arches forming the principal source of attention. With a second-grade firebrick and using a rise of not less than 1½ in. per foot of width, arches that have been in service three years do not appear to be impaired. In some fireboxes, where, because of some exigency, barley fuel was replaced by a larger size of anthracite, the terrific temperatures developed ruined the arches in three weeks' time.

"It is possible to give only approximate figures as to the cost of repairs to boiler settings in the Wyoming field, as the type of boiler used, the excess rating carried and the character of the fuel all exert their influence. The average cost of repairs for brickwork and grate-bar parts does not exceed $50 per 100 hp. per year and may, indeed, be much less than this amount in particular instances. The cost of cleaning boilers varies with the character of the water used. The use of water from the Susquehanna River entails unusually high expense. When using good water boilers need not be cleaned any oftener than every three to six months. In a plant using river water the boilers must be cleaned continually, which means that each unit gets its turn every 8 to 12 weeks.

"Water softeners have been installed at the plants using river water, and the cleaning, it is hoped, will degenerate into nothing more serious than a semi-annual inspection. Using good water, boiler tubes should last from 10 to 15 years; in plants using such water as that in the Susquehanna River as many as ten tubes a week are replaced.

"Stack drafts represent a fertile field for fuel economy. It will be found, upon examination, that at few colliery boiler plants is the subject of draft given any consideration. The steam-generating units are invariably operated with the dampers wide open under all load conditions, if, indeed, any dampers at all are found in the stacks.

"The average colliery boiler plant receives as little attention from coal company officials as possible. While admittedly the heart of the operation, such a plant seems to be regarded as a necessary evil. As long as it delivers steam at a pressure sufficient to keep all engines and pumps moving, a foreman will not go near it.

The class of labor employed is such that no refinements such as carbon-dioxide recorders to reveal stack losses, automatic balanced draft control, flow meters, etc., may be installed. Once out of repair, such devices are apt to remain so. As lasting economic results can be obtained in a boiler plant only through hard work and intelligent effort, the average colliery boiler must remain a mediocre performer, as this combination is almost impossible to obtain."

The second letter received is from a mechanical engineer of one of the large independent coal companies. It shows ideas somewhat different from those enunciated above.

"In the operation of boiler plants the following objectives must be kept constantly in view if lasting success is to be attained: (1) Simplicity of construction and operation, (2) steaming capacity, (3) uniform operation of the furnace, (4) a saving in fuel through the consumption of inferior grades of coal.

"Any efficient type of boiler equipped with a dutch-oven furnace and dumping grates of the pin-hole, corrugated-surface type will, if properly hand fired, maintain low furnace velocities and provide perfect combustion without erosion or damage to the furnace lining. The cost of such equipment is far less than that of any other. Stoker installation is expensive and a large percentage of the mechanical parts are subject to the action of high temperatures. Stokers will not handle coal of many sizes and excess moisture must be removed from fuel that is to be stoker fired.

"To insure perfect combustion, trained supervision is necessary. The human element is present just as it is in the plant fired by hand. Clinkers adhere to the side walls. In consequence where traveling grates are used the fire is disturbed and cold air enters the furnace. With such a stoker, if the speed of travel is not carefully regulated, either unconsumed carbon passes over the end of the grate or cold air enters the furnace, the fire bed having burned out before reaching the end of the grate. If the fire is to be given proper supervision and if clinkers are to be removed, the furnace doors will have to be opened almost as frequently as with hand firing.

"The most efficient plant is a furnace equipped to burn pulverized or powdered fuel. In pulverized form all the combustible is burned. This is not possible in either hand- or stoker-fired plants. By the use of pulverized coal 15 to 30 per cent of the fuel can be saved.

"No mechanical equipment is installed within such a furnace and there are no standby losses. If the furnace is properly proportioned the linings rarely need to be repaired. Furthermore, manual labor in firing is eliminated. Furnace temperatures are uniform and of about the same intensity as those obtained with liquid fuel. The investment necessary to install a pulverized fuel or stoker plant is, however, too high for the average mine. A dutch-oven installation is not expensive, the results obtained are good and when considered on a basis of equal efficiency, insurance, taxes, interest and cost of operation such a furnace is considerably less expensive than with those involving other methods of firing.

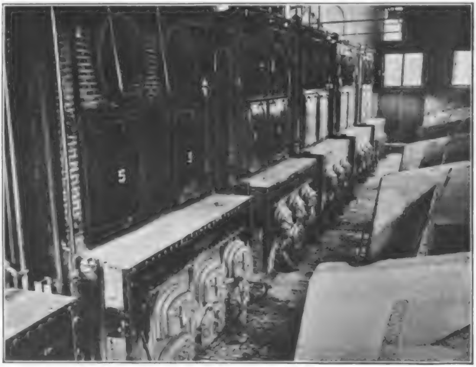
"Exact draft control is not necessary if each boiler has its own stack. When, however, one stack is used for a number of boilers, the control of the draft becomes highly important.

"This company uses certain grades of fireclay and finds that they give results as good as high-temperature cement."

Thus do engineers differ. The following letter shows a still further divergence of ideas. This letter is from the combustion engineer of one of the large coal com-

Boilers with Dutch Ovens

At No. 2 shaft of the Kingston Coal Co. These boilers are of Babcock & Wilcox type, each 300 hp. and operate at a 200-per cent rating. By building out the combustion chambers it is possible to get an intense heat unrelieved by the cooling effect of the boiler tubes. The coal is therefore burned at a high temperature. By this means it has been possible to get good results out of fuel that by reason of its fineness and of the high ash that inevitably accompanies fine unwashed coal is difficult to burn satisfactorily.



panies all of whose plants are hand-fired, with the exception of one which is fitted with Coxe stokers.

"Maintenance and upkeep of the firebox depends upon many features of operation and construction as well as on the facility with which repairs are made as they become necessary. The harder a boiler is forced, the more intense is the combustion and the more rapid is the deterioration of the firebox. Especially is this true where chain grates, or what are commonly known as mechanical stokers, are employed, wherein the fuel is dry and fine and is fed into the furnace with a blast of air sufficient for its complete combustion.

"In such installations it is not uncommon to obtain from 200 to 300 per cent of rating at times of peak load. Under such circumstances it is not unusual to melt the best grades of firebrick linings obtainable, while at all times the best materials that can be obtained are none too good for use in the construction of fireboxes.

FAVORS RED BRICK FACED WITH FIREBRICK

"In our hand-fired boilers, for the most part, the fireboxes are made with plain walls, laid up with red brick but faced with firebrick, header courses being used along the fuel bed. These fireboxes require but few repairs, the greatest deterioration occurring along the fire line. This is more pronounced with some fuels than with others.

"Some furnaces are constructed with what is known as a dutch oven. This is in effect a brick arch over the front portion of the grate area and projecting outward in front of the boiler. These arches are in most cases sprung, but in some instances they are suspended.

"Fireboxes equipped with chain grates are usually much longer or deeper than those for hand-fired boilers. They, like the dutch ovens, project out in front of the boiler. The protruding front end of the firebox has a roof composed of an arch of some form or other, as has the rear end also in the more modern installations.

"Some people favor the sprung arch because it can be installed without special material. A lower initial cost is claimed for this construction as well as less expense of maintenance. However, with the sprung arch it is necessary to brace the skewbacks, or points of support, securely, and in my estimation a chain grate cannot be operated as satisfactorily with a sprung as with a flat suspended arch.

"With the latter it is necessary to keep the iron and steel supporting members cool enough so that they will be unaffected by the heat. The protecting brickwork accordingly must not be allowed to deteriorate to such an extent as to overheat these supports or the whole arch will be ruined and require replacement at much expense. Besides the boiler will be put temporarily out of service.

"With chain grates clinkers forming on the sides of the furnace along the fire line give much trouble and many expedients have been tried to overcome this difficulty. I believe the use of silica brick at this point has proven conducive to satisfactory operation.

"The forcing of boilers to high rating, with resultant higher temperatures, shortens the life of a firebox and increases the attention and expense that must be bestowed upon this part of a boiler plant. Its limitations are dependent upon the conditions that are encountered at each individual boiler installation."

Different ideas exist as to the proper type of firebox and the measures necessary for its maintenance. The following letter shows opinions varying somewhat from those that have preceded it. It also sets forth some results obtained from different types of boiler settings. Table I lists the dimensions and types of the furnaces employed.

TABLE I. TYPES AND DIMENSIONS OF ARCHES IN AN ANTHRACITE BOILER PLANT

Sprung Arches—Hand-Fired Boilers			*Sprung Arches—Stoker-Fired Boilers*		
Plant No.	Approximate Width of Furnace, Feet	Approximate Length of Arch, Feet	Plant No.	Approximate Width of Furnace, Feet	Approximate Length of Arch, Feet
1	5	8	7	6	7
2	6	7	8	6	8
3	7	8			
4	12	7	*Flat Suspended Arches—Stoker-Fired Boilers*		
5	12	8			
6	6	10	9	6	8

"Installation No. 1 is under 293 hp. four-drum Stirling boilers fitted with double-arch or divided furnaces, in fact, with two distinct furnaces per boiler. This plant burns culm and no serious trouble has been experienced carrying 175 per cent of rating. Repairs are negligible. Installation No. 2 is under a 150-hp. Babcock & Wilcox boiler with dutch oven. One plant is running at about 200 per cent of rating and no repairs to the arch proper have been made in eleven years.

"No. 3 is under 400-hp. four-drum Stirling boilers, two furnaces or arches per boiler. No serious arch trouble has been experienced in nine years, when burning a mixture of rice and barley. Difficulty recently was encountered, however, in burning higher-grade fuel. This plant runs at 130 per cent rating. No. 4 is under 300-hp. Babcock & Wilcox boilers running at 125 per cent of rating with dutch-oven furnaces. No serious trouble has been encountered since the side walls were properly buckstayed. This installation burns rice and barley coal.

"Furnace No. 5 is under 311-hp. two-drum Stirling boilers fitted with a single furnace. This gave continual trouble, and arrangements are now being made to divide the furnace. No. 6 is under a 400-hp. two-drum Stirling boiler, with a divided furnace. This unit is running at 125 per cent rating, burning barley coal. No serious trouble has been experienced.

SPRUNG ARCHES STILL GOOD AFTER FIVE YEARS

"Installation No. 7 is under 150-hp. Babcock & Wilcox boilers. This is the extended type of furnace with Coxe stoker, burning barley and slush. No serious main-arch trouble has developed in five years. No. 8 is under a 283-hp. four-drum Stirling boiler with divided furnace. A Coxe stoker is installed and the boiler operates at 125 per cent of rating. No serious arch trouble has been encountered in five years. Barley and slush are burned. Furnace No. 9 is under a 283-hp. four-drum Stirling boiler with divided furnace and Coxe stoker operating at 125 per cent rating. No repairs to the arch proper have been made in three to four years.

"Repairs are made to the furnace side walls and door arches every three months, when the boilers are cleaned. In hand-fired furnaces this is necessary because clinkers form on the side walls and because of the action of the dump grate. Door arches are subject to shock caused by the slamming of the fire doors, to sudden and frequent changes in temperature and to the wear which fuel and fire tools cause when they come in contact with them.

"Although in stoker-fired furnaces we place carborundum brick in the side walls at the grate level in order to prevent the formation of clinkers, some deposits nevertheless adhere to these brick and in time must be cleaned off. In doing this work the corners and edges of the bricks break off with the clinkers, making it necessary that they be renewed.

"The width of the firebox and arch is as a rule fixed by the boiler width. A certain area of gas passage must be provided between the end of the arch and the tubes (in four-drum type Stirling boilers) to permit maximum combustion to be obtained. This fact limits the length of the arch. How high the arch should be placed above the grate is a question. I myself favor a design wherein the arch is reasonably close to the grate. The stoker manufacturers favor one which is set comparatively high, doubtless because a low arch and high combustion rate tend to create a plus pressure in the furnace, prematurely burning brickwork and stoker parts.

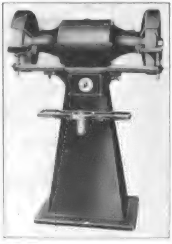
"So far as the effect of hand or automatic regulation of stack dampers is concerned, a partly closed stack damper tends to create a pressure over the fire. This will naturally shorten the life of furnace brickwork, but the loss thus sustained is counterbalanced many times over by the saving in fuel effected through a lower velocity of gas travel.

"In reference to the use of high-temperature cement, a filler or thin coat of this material is placed on the under surface of the arch. Side walls are filled with this cement, forming as nearly as possible a T-joint, so that the edges of the brick may be protected. The crown of the arch is grouted with a good coat of fireclay and high-temperature cement."

A Grinder That Can Be Used Wherever Alternating Current Is Available

A NEW 2-hp. alternating-current grinder mounted on a floor pedestal is shown in the accompanying illustration. As may be seen, this machine is fitted with a tool-tray, water pot and suitable tool rests, and the control switch is placed within easy reach of the operator. The bench type is in all respects similar to the one here shown except that a bench stand replaces the pedestal. The shaft is hung in double-row ball bearings and the wheels are mounted 7 in. from the body of the motor casing, which facilitates grinding of large or irregularly shaped work.

These tools are made for either 110-, 220- or 440-volt 60-cycle current, either two- or three-phase. The wheels to which they are adapted are 12 x 1½ in. and are normally made one fine and one coarse. These grinders are better than those of belt-driven type in that no countershafts or belts are necessary and consequently a machine can be moved quickly and easily to any point in the shop which necessity or convenience may dictate. This grinder is being manufactured by the Standard Electric Tool Co., of Cincinnati, Ohio.

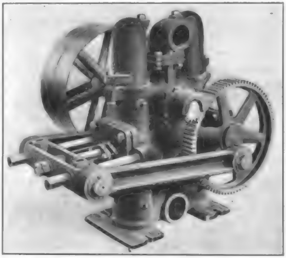


CURRENT DRIVEN GRINDER
This machine can be moved to places where a belt-driven tool would be useless.

Belt-Driven Mine Pump Suited to Low Coal

A SMALL mine pump of somewhat unusual design is shown in the accompanying illustration. It is intended for use where headroom is scant and in the largest size the height is only 37½ in. Its principal use will be in gathering, although it is built sufficiently heavy to operate against 175 to 200 ft. of head.

This pump is extremely simple in design. The frame and cylinder is a single casting, which also contains the bearings and one cylinder head. This construction not only minimizes packed joints but assures rigid alignment of all working parts. The cylinder is either brass or bronze lined.



BELTED MINE PUMP FOR LOW HEAD ROOM
Frame and cylinder form part of a single casting which also provides one of the cylinder heads. In consequence the pump is always well aligned.

Shafting of high-carbon open-hearth steel carrying cut gears, steel-rod guides, on which the crosshead slides on babbitted bearings, and cast connecting rods, both ends of which are provided with renewable bronze bushings, are some of the more important details of design. The piston rod is of steel, brass-cased. The air chambers are of low pattern and two in number, placed directly over the discharge valves.

As may be seen in the illustration, these pumps are intended to be belt-driven, tight and loose pulleys being provided for this purpose. While the mine atmosphere usually is hard on a belt this arrangement permits keeping both pump and motor down to the level of the mine floor. These machines, produced in five sizes and two types and known as the Pyramid design, are built and sold by the Goulds Mfg. Co., of Seneca Falls, N. Y.

USE OF THE WIRELESS TELEPHONE in mine-safety and mine-rescue work has been suggested to the U. S. Bureau of Mines. High-power sending stations at the bureau's experiment stations at Pittsburgh, Pa., and Salt Lake City, Utah, could broadcast messages to the various mine safety offices and cars stationed throughout the country. Field engineers of the bureau have reported that the ratio is already in wide use in the different mining centers.

Operators in Missouri Field Strip Beds Wherever Cover Does Not Exceed One Foot for Every Inch of Coal*

Advancing Methods with Center Cut—Retreating System Demands Cars with Detachable Bodies and Crane—Ways of Starting to Remove Cover with Different Depths of Overburden—Three-Eighths of Coal Already Mined

By William W. Weigel†
Rolla, Mo.

In general two systems of strip mining and plant layout are used in the Minden district of Missouri which might be termed appropriately the advancing and retreating methods. The first appears to be that more generally favored, especially where irregular extensions of the stripped area do not have to be operated.

In the advancing system the work is started near the tipple and is extended away from it. To avoid frequent moves as long a cut as possible is desirable. The cut, therefore, usually is run the full length of the property. The direction of the boundaries and the lay of railroads, among other considerations which are less important, determine the direction of the crosscuts and the tipple. In the advancing system the track for the coal cars is carried in the bottom of the pit, and a cut for the track must be kept open running from the working cut to the tipple. At this cut the track turns both ways, and for this reason this method of working has been dubbed the Tee system. Some mines, however, have a track at the side. At most of the mines the track is carried from the bottom of the cut by a slope extending from the top of the tipple, a trestle being built to that structure from the point where the slope reaches the surface of the ground.

Getting the Shovel Down to the Coal

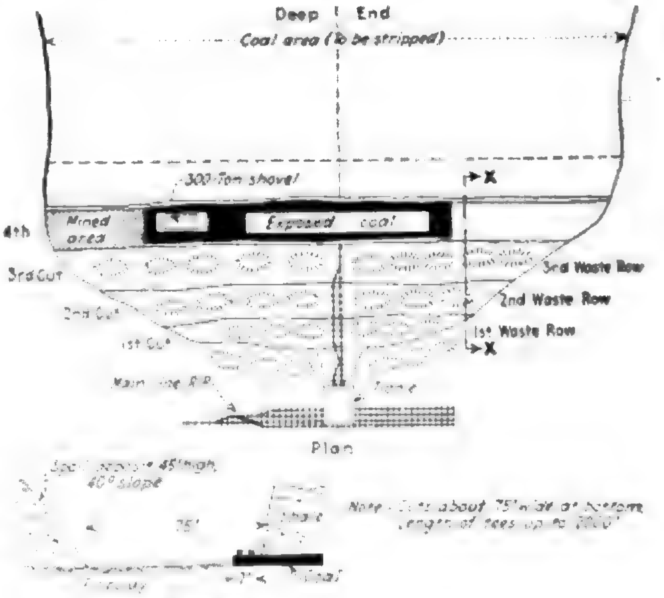
At some of the mines, however, where the railroad is directly adjacent to the coal area, the track runs over the surface before descending to the coal level by a steep grade. The first work in starting a pit is to dig this slope. This is done by hand and wagon and is extended by these means till enough room is made for the operation of a mechanical shovel. Bringing the shovel down to the coal level always is a difficult and tedious operation. Usually the excavator has to be more or less dismantled for this purpose and has to be reconstructed when in place. Even then it has to be placed on skids and lowered with the aid of jacks.

The through cut is started by one of several methods, which one depending largely on the thickness of the overburden to be removed. Where the cover is thin the best method is to deposit material stripped over the material which will later form the second cut. The coal having been mined and removed from the area of the first cut, the second cut of dirt with its covering of material from the first excavation is deposited behind the shovel in the pit first dug. In Missouri this method is not used to any extent, as the cover is too thick. Coal with less than 12 ft. of cover rarely is stripped in the Pittsburg field because the coal is of poor quality wherever the cover is no thicker. At some mines large areas have been found where the coal was so dead as to be unsalable. The chief advantage of this method is that all the coal is recovered. None is lost by being buried with the cover unstripped.

The system which is used almost exclusively is one adapted to the general thickness of the overburden, which is from 12 to 25 ft. The dirt taken from the cut simply is piled back on unstripped ground, causing the coal under the area thus covered to be lost, for the cost of handling such a large quantity of dirt twice would be prohibitive.

If the cover is over 25 ft. thick the height to which the dirt must be piled on the natural surface becomes excessive. In this case a cut is made in the same manner as in the foregoing method except that only half the cover is taken off. Then adjoining this cut a second cut is made to the full depth of the coal, the dirt being piled in the half cut. This method causes the loss of still more coal but avoids the necessity of using top-heavy shovels with extra-long booms.

After the property has been opened by running a through cut by one of these systems, the cut being extended to the full length of the property, the shovel reverses, working back in the opposite direction on another cut. The coal having been removed, the dirt is piled in the former cut. The work then consists simply



THE PLAN OF STRIPPING IN THE MINDEN DISTRICT

This is the advancing method of mining. A roadway has been maintained from the tipple to the working cut and this constitutes one of the drawbacks of this manner of operating.

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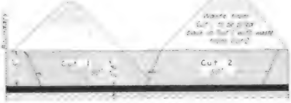
*Extracted from Bulletin 4, Vol. 5, of School of Mines and Metallurgy, University of Missouri. This book contains a full, extremely interesting and capable review of mining and mine conditions throughout the State of Missouri.

†Assistant in mining, University of Missouri.



FIRST CUT, WHERE COVER IS UNDER FIFTEEN FEET

The first cut is made to the coal, the cover being piled back over the area which will later constitute the second cut. In making the second cut all this has to be reshoveled into the area occupied by the first cut. This double shoveling is expensive but saves coal. Only with low cover is this system feasible.

of working back and forth across the property, taking successive cuts, in each case piling the dirt in the previous cut after the coal has been mined. This is known as "course-stacking."

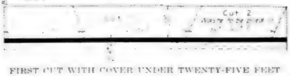
The aim in laying out the property is to have as long and straight a cut as possible. Shovels are not adapted to making curves or working out odd corners. Sometimes, however, conditions compel the working of such places and much ingenuity often is displayed in uncovering advantageously the coal in these corners.

The various units of the organization—the overburden shovel, the loader and the car service—should so work that the shovel will not be kept waiting for dirt room. Several shifts often are lost for this reason. Sometimes it is necessary to run the shovel clear to the other end of the cut before dirt room is open. More commonly the loader is close behind the shovel, and two shifts are lost, in which the shovel is shoved forward to the face, the loader working in beside it.

FOR SAFETY KEEP SHOVEL FROM COAL LOADER

Running the loader close to the shovel is objectionable for two reasons: First, many accidents are caused by this practice; second, there is no reserve of coal, and if the shovel is idle the loader is rendered idle also. One company, by running the shovel at top speed, keeps a large reserve of coal always at hand. By transferring the loader back and forth, which is easily done, the caterpillar machines especially being readily moved, the shovel rarely need be made to wait for dirt room and accidents are avoided. The chief disadvantage of this delay in lifting the coal is that washes from the soil banks may spoil the fuel.

A retreating system used by one company has notable advantages. The first cut is started in that part of the property most remote from the railroad and is carried back toward the tipple. The track is not laid in the pit but along the side. Cars with detachable bodies are used. These bodies are picked off the track by a crane located in the bottom of the pit and swung down to the loader.

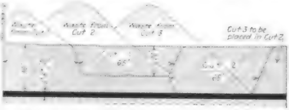


FIRST CUT WITH COVER UNDER TWENTY-FIVE FEET

Here the cover from the first cut is placed over good coal near the boundary and is never recovered. A strip of coal 60 ft. wide is lost.

The chief advantage of this system is that the center cut for the track is avoided. With the center cut dirt which should be piled in the area of the track is sometimes disposed of with difficulty where the cover is thick and the adjacent spoil banks are accordingly high. Only one locomotive is required when the car bodies are spotted by the crane, but the potential capacity of the equipment is lowered, as time is lost in transferring cars, and many more men are required, as the cars on the bank have to be steadied. Furthermore, a craneman and helper must be employed, but these take the place of the extra locomotive crew.

The district has almost standardized as to the means of excavation, revolving steam shovels being used with the 300-ton size, with the 4-yd. bucket as the favorite. Larger sizes—up to 350 tons—are being introduced. One mine replaced an 8-yd. bucket by one holding only 6 yd., regarding the former as too large. Those mines in Kansas that are located close to Pittsburg can avail themselves of purchased electric power and are buying electrical equipment. As yet only two mines in Missouri have been so equipped. One of these uses an electric shovel.



FIRST CUT WHERE COVER EXCEEDS TWENTY-FIVE FEET

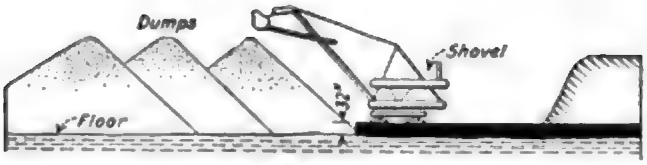
Here the first cut is 20 ft. deep and does not reach the coal. It is piled over coal that is never recovered. The second cut is piled where the first has been removed and the coal under the first cut also is lost. An area of coal 115 ft. wide is entirely wasted by this method.

The advantages of the electric shovel are leading to its further employment. By its use the crew is reduced by two men and often three. These are the firemen and the coal loaders serving the shovel. To supply coal for the furnace on the steam shovel pot holes are shot in the coal seam and the excessive quantity of powder used in this operation greatly shatters the remaining coal. With an electric shovel there is no need to disturb the coal, which, furthermore, is not littered with ashes from the shovel furnace and is cleaner in consequence.

The shovels will make a cut 75 ft. wide, but this is rarely done. The usual width is from 60 to 65 ft. This width of cut is better suited to the coal loader and avoids the possibility of burying a narrow strip of coal between cuts.

The standard crew for a steam shovel is eight men—an engineer, a craneman, an oiler, a fireman and four groundmen working on the track and obtaining coal for the shovel. For a mine having a capacity of over 350 tons per day, in the usual thickness of cover, it is necessary to run the shovel two shifts per day, which, of course, makes two crews obligatory.

Although not general practice, the use of shots to break up the cover ahead of the shovel much increases its capacity and reduces the wear upon it. The shale immediately overlying the coal is rather hard, although the shovel will dig through it. One company has greatly increased the shovel capacity by the use of dynamite. Two-inch holes are drilled with a churn drill, three across the cut in rows about 30 ft. apart.



CROSS-SECTION OF A STRIPPING PIT
This represents a pit in full working order. The shovel is "course stacking." When the work is fully started no coal—at least practically speaking—is lost.

These are squibbed with two charges of four, eight or sixteen sticks of dynamite. The holes are then each loaded with the remainder of a 50-lb. box and all three holes shot together with electric detonators.

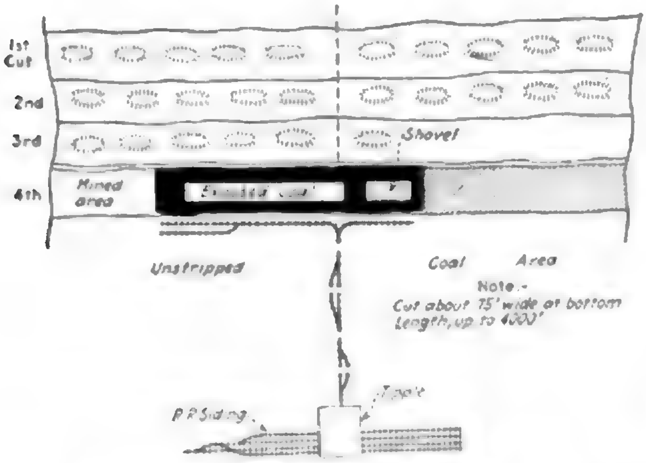
Mechanical loaders are the latest development in the field. One such machine with two men—the operator and foreman—completely replaces a large number of men loading by hand. In addition the complicated system of sidings and switches that is necessary with hand loading is replaced by a single track. With these loaders the full 65-ft. cut can be cleaned up with one operation, but it is customary to take the cut in two parts, one-half with the track on the coal and the other with the track on the bottom.

Both forward- and backward-dump scoops are used, but the first is the more general. Both wheel and caterpillar tread are used. The caterpillar tread is preferable on rough pit floors although not so stable as the wheel type.

EACH SCOOPFUL IS INSPECTED

Unfortunately mechanical loaders do not produce as clean coal as can be loaded by hand, but the saving in labor more than compensates for this. The loading of dirty coal can be largely avoided by posting a man at the head of the scoop to pick it over and to signal the operator to dump the load on one side if the shovel makes a cut into a horseback.

Loaders will dig unshot coal, but the wear is so excessive that coal is rarely dug without prior shooting. Hand augers 1½ in. in diameter are used to drill holes on 12-ft. centers. The holes are loaded with black powder in rather heavy charges. Excessive quantities of powder are used, as little attention is paid to tamping and the charges are large. The heavy charges tend to produce a large quantity of slack.



RETREATING SYSTEM OF STRIPPING COAL
Here the furthest coal is taken first. The track from the tipple is laid on the surface of the ground and a crane in the pit takes the detachable bodies of cars off a track laid along the edge of the working face and places them where the loader can fill them. They are then lifted to their proper place over the car trucks and secured in place. This plan lowers the capacity of the strip pit.

All the mines use end-dump 3-ton cars, although, as actually loaded, they often hold less than 2 tons. Most of them are of wood, but steel bodies are finding more favor. The cars with detachable bodies for the retreating system have tracks provided with U-shaped supports fitting into channel irons of the steel frame of the car body. Standard industrial steam locomotives are used for motive power. The rail weights vary from 30 to 50 lb. The track gage is 42 in.

Little seepage comes into the pits from adjoining areas because the clay and shale cover over the coal does not pass water readily. Little water also comes from old strippings into the pit as the banks near the working cut are the highest. At many mines small steam pumps provide for drainage, the lower parts of the old stripped cut acting as sumps. If the pump is close to the tipple and power house a steam line is run to it. If not, a small vertical boiler is installed nearby.

Owing to the low lift on the water, the use of centrifugal pumps is quite general. Small units are driven by gasoline engines mounted on trucks. These serve as auxiliaries to carry water to the main sump. In some mines a direct-connected motor-driven centrifugal pump is used. Should streams or creeks be encountered they are temporarily diverted till cut through. Where they have to be carried over the cut made for the center track, aqueduct bridges are used.

The cars on being pulled to the top of the slope are dumped automatically. All the mines use shaker screens of suspended type and from three to five sizes are made. A three-size tipple will make coal which will pass through 1¼-in. and 3-in. openings, shipping all over these sizes as lump. A five-size tipple will make ¾-, 1¼-, 2½- and 3½-in. coal and ship the rest as a separate size. No coal is hand picked on the tipple, but some companies have men on the lump cars who remove dirty coal. No coal is crushed.

AS MINED THE COAL IS FINE

About 40 per cent of the coal passes through the ¾-in. screen; 30 per cent through the 3-in. screen and over the 1¼; and 30 per cent passes over the 3-in. screens. The power plants are, of course, small. Two 54-in. return-tubular boilers usually provide all the steam needed. At some mines marine boilers of from 9-ft. to 12-ft. diameter are used. The tendency is to discard the boilers and use them only in case of an emergency.

The economic limit for stripping the Weir-Pittsburg lower seam, which is the only seam mined, is between 30 and 35 ft. As most of the coal territory in Barton County—the Minden area—is under less cover than that stated most of the coal is stripped. In 1919 only four shaft mines were being operated on the Missouri side of the field. The coal runs from 30 to 33 in. in thickness. The area covered by coal is about 23 square miles. Out of the 66,240,000 tons available about 12,000,000 tons have been mined or lost, leaving about 54,000,000 still untouched.

ENDURANCE TESTS OF STORAGE BATTERIES for use in permissible mine locomotives, made by the U. S. Bureau of Mines at Pittsburgh, Pa., indicate that the battery cells at present supplied for mine locomotives have sufficient mechanical endurance to withstand the ordinary jolts they are likely to receive in service. It appears probable that no great hazard will result from the use of properly installed and cared-for batteries in permissible locomotives. Details of these endurance tests are given in Serial 2358, just issued by the Bureau of Mines.

Problems of Operating Men

Edited by James T. Beard

Advancing vs. Retreating Plan in Mining Coal

Advancing Plan of Mining Not Economical — Experiments Tried and Abandoned for the Retreating Method — Refutes Idea of Foreign Mining Men Being Prejudiced

FOR some time past, I have been trying to find opportunity to comment on the letter of James F. Gamille, which appeared in *Coal Age*, Feb. 23, p. 332.

Writing on the subject of "Economy in Mining Coal," it is amusing to find an unqualified endorsement of the advancing system of mining, as being both economical and bringing the largest returns in the quickest time. It is quite true that the advancing system does bring quicker returns on the investment than is possible in the retreating system of mining; but how about the relative economy of these two methods.

Had that writer been able to put his idea into practice, as he says an opportunity never presented itself for so doing, I have no doubt it would have changed his mind. Inasmuch as that was not the case, however, a little of the experience of others, along that line, may prove of benefit to him.

On several occasions I have had the opportunity of observing the disastrous results that so often follow the adoption of the advancing system in mining coal. One place, in particular was at a mine of the Berwind White Coal Company.

ADVANCING METHOD FAILS AND THE RETREATING METHOD ADOPTED

It is hardly necessary to remark here that the mines of that company are the most up-to-date of any like operations in this country. In the instance to which I refer, the mine was opened and worked on the advancing system, with the result that the company paid dearly for the experiment. Now, the headings are driven to the boundary, before any rooms are turned away.

On the present retreating plan, when the entries have reached the boundary, five or six rooms are turned off, driven up and the pillars worked back on an angle that experience has shown to be the best in causing the roof to cave.

Working under 500 or 600 ft. of cover, with 50 or 60 ft. of sandrock, immediately overlaying the coal and a soft fireclay bottom, is quite a different proposition from working under 50 to 100 ft. of cover and a slate roof.

Perhaps Mr. Gamille fails to realize that conditions in American mining, in this respect, are not different from the conditions in other countries. Let me say, here, that miners in other countries never lose sight of the economical idea; but, instead, it is thoroughly instilled into their minds, both at work and at home. Economy is the watchword.

It is my good fortune to belong to that class of old-country miners, whom he regards as "men of one idea," adding that "it is difficult to impress them with the advantage of a new plan." I am proud to say that my eighteen or twenty years experience, in English mines, has been of untold benefit to me in America.

There are doubtless hundreds of other men, holding positions high in authority in this country, who can say the same thing. Instead of being prejudiced, their past has made them men of expediency, which fact is largely responsible for their being here and working in American mines.

Indiana, Pa. THOMAS HOGARTH.

Opinions of Firebosses

Opinions differ in regard to some points but most agree that the character of a fireboss will prove his surest safeguard when his marks have been destroyed by a roof fall.

IN MY opinion, the question presented by the Halvetia fireboss, *Coal Age*, March 30, p. 538, suggests the need of shorter runs for firebosses in making the morning examination.

The very fact that a heavy fall of roof occurred shortly after the place was examined by this fireboss is evidence that his visit to the place was hurriedly made and the time did not permit of a sufficiently thorough inspection of the roof, which would have revealed its dangerous condition. That being the case, the examination he made did not comply with the chief intention of the law, which was to safeguard the miner who would enter later for work.

WHAT THE EXAMINATION MEANS

First of all, an official examination of a working place means an expert decision as to whether any special danger exists therein. While the placing of a mark and the date at the working face of a place examined is only secondary, it is necessary as evidence that the required visit was made, even though it failed of its real purpose.

A few years ago, I had a somewhat similar experience in a Pennsylvania shaft. In that mine, triple entries paralleled the Monongahela River and, owing to the water seeping through the strata, it was impossible to make a chalk mark on the walls that would be fairly visible to the miner when he entered for work.

INSPECTOR THREATENS PROSECUTION OF FIREBOSS, NOT FINDING HIS MARK

The state inspector threatened to prosecute me, because he failed to find such mark as evidence of my having examined those headings that morning. He allowed that the place was wet, but claimed that my common sense should have told me to use a board on which to place the mark and set it along the rib or at the face of the coal.

It was some time before he could be convinced that I had performed my duty; but he was finally persuaded by what proof I could present and the statements of others regarding my faithfulness and the matter was prevented from going to court.

The Halvetia fireboss should not be too harshly criticised, particularly if this is the first evidence of his failure to carefully examine the working places in his charge. His marks in adjoining places and on the tops of falls should be checked up and if found properly dated his word should be accepted without question.

Pikeville, Ky. GEORGE EDWARDS.

THE question of exonerating a fireboss when a fall has occurred in a working place, in a portion of the mine in his charge, and the miner working that place is severely burned, by igniting the gas while trying to find the fireboss' mark, may be a difficult question to decide.

Consider, for a moment, the miner's responsibility in the matter. On entering his place he finds a heavy fall at the face and, notwithstanding, proceeds to creep around the fall or go over it, as the case may be, to see if the fireboss had left his mark at the face.

MINER TO BLAME FOR HIS INJURIES

In my opinion, the miner should have returned at once and reported the condition of his place to the mine boss or one of his assistants and should not have attempted to go around or over the fall to look for any mark by the fireboss. It is my belief that this miner was himself to blame for being burned. He should have known the danger of proceeding to examine such a place with an open light.

Regarding the fireboss, let me say if he is a conscientious fellow, he will doubtless have the confidence of the mine boss and that will go far in his favor. In other words, his record in the past will be strong evidence that he did not fail in his duty in this instance.

COMMON PRACTICE OF FIREBOSSES IN EXAMINATION OF MINES

Assume for example that this accident occurred in, say the third room on a pair of headings. Starting his examination, the fireboss enters the first room, which we will say is 200 ft. deep; and, passing through the breakthrough, he examines the face of the second room, which may be 175 ft. deep. Again passing through the breakthrough into the third room, which is 160 ft. deep, he continues in this manner to examine the face of each room, only returning to the entry when he reaches rooms that have not been driven far enough for a breakthrough.

I believe this is a common practice with firebosses; it was the plan I followed myself when firebossing. When following the face from room to room, in this manner, it is quite possible that the fall may have started back a short distance from the face and was missed by the fireboss passing through the breakthroughs.

EXONERATES THE FIREBOSS

In my opinion, taking everything into consideration, there is no reason why this fireboss should not be exonerated and the miner severely blamed for proceeding over or beyond the fall when he entered his room for work. What good would it have done him to have found the fireboss mark at the face? It would not have increased his own safety. As required by law, he should have reported the condition at once to the mine foreman or one of his assistants. A careful man would not have thought of trying to get to the face when his way was blocked by a fall. W. W. HUNTER.

Vincennes, Ind.

REGARDING the marking of a place examined by a fireboss, it has been our custom to use two marks. At the face, our firebosses mark the date and again, at a point about 10 ft. outby from the last open cut-through, they leave another mark on the track tie.

If the place examined is all right he marks the tie "O.K." and the date. He may have found a little gas that he has brushed out of the place. Then, he marks the tie "gas" and "fan," which means that the miner must do a little fanning himself to brush away any gas that may have accumulated since.

All of our miners would know that any fall of roof they might find on entering their place had occurred since the fireboss made his examination, unless his mark showed on the face of the fall. In any case, however, a miner should know that it would be very unwise for him to proceed further, until the place had been inspected again and found safe.

UNSAFE ACT OF MINER

It was certainly a very unsafe thing for this miner, on seeing the fall, to proceed to look for the fireboss mark at the face. The fact that the law requires the fireboss to leave a mark should be sufficient warning to any miner to make no attempt, himself, to get past or over a fall.

Judging from the facts as they have been given in this case, I would not consider that any blame attached to the fireboss for the injury of this miner. Certainly, he had no one to blame but himself when he went beyond the fall, which he should have known had occurred since the fireboss was there.

The use of two marks, one at the face and one outby a distance, should appeal to most men as being the safest method to adopt. If I am not mistaken the Pennsylvania law requires the mark to be made at the face and on the rib. However, the marks in the adjoining places should leave no doubt that the fireboss had been in this place also. GAS BOSS.

Worley, Ky.

PERMIT me to express my view of the "Question for Firebosses," that appeared in *Coal Age*, March 30, p. 538, where a roof fall occurred after the fireboss had made his examination and destroyed his mark left at the face.

As a fireboss, I once had an experience much the same as here described. My section of the mine gave off gas occasionally, but there was an ample supply of air to take care of that condition. One morning, after having made my examination and reported everything safe for work, I was much surprised, on returning to the mine after breakfast, to find that the last entry I had examined had caved and the men who worked there were waiting for me.

Finding there was no further danger, I took one of the men with me over the fall to the face of the heading to show him my mark and satisfy him that I had been there before and examined the place, as required by law. I know the men never doubted my word as I had always done my duty faithfully.

RECORD OF FAITHFUL WORK SUREST SAFEGUARD OF FIREBOSS

Let me say here, that conscientious work is the fireboss' surest safeguard when an unforeseen accident occurs. The fireboss is then given the benefit of the doubt.

On the other hand, a fireboss that performs his work carelessly or neglects his duty should be sufficiently punished by the thought that he had been the cause of injury or loss of life to others. In my own case I could suffer no greater punishment.

Where a mine is generating gas in sufficient quantity, the law requires the mine foreman and fireboss to see that safety lamps are used for the protection of the men, for whose safety they are responsible. THOMAS KERR.

Worthington, Pa.

BEING fully acquainted with the troubles encountered by a fireboss, I have studied carefully over the question of what the law should require every fireboss to do when he has examined a place, whether or not he has found it to be dangerous.

I am not acquainted with the Pennsylvania law on this point, but believe it must state that the fireboss shall leave some other mark than that on the face of the coal. Where the law only requires the fireboss to mark the face of the coal any miner is liable to be burned on entering his place and looking for the mark.

TENNESSEE LAW REQUIRES DANGER BOARD PLACED AT SAFE DISTANCE

On this point, the Tennessee Mining Law requires a gas boss who finds danger in a working place, to bar the entrance, or to place an obstruction at a safe distance from where the danger is found. At that point, also, he must place a board on which he marks what kind of danger he found.

The law adds, "Such obstruction shall be sufficient notice to all persons not to pass, except it be in the presence of the mine or gas boss and, then, only for the purpose of removing the danger found to exist there." (Sec. 20). In my opinion, this should be the requirement in every state mining law.

Crawford, Tenn. OSCAR H. JONES.

[The Bituminous Mine Law of Pennsylvania (Art. 5, Sec. 1) requires the fireboss to leave his mark, "at the face and side of every place examined [together] with the date of the examination." The only safe practice for a fireboss to follow is to place a second mark in each working place examined. EDITOR.]

Realizing on Mining Investment

Mismanagement of the mine due to various causes—Plan of mine must be adapted to conditions—Public demands cheaper fuel—Superintendent responsible for damage to mine.

MANY letters in *Coal Age* have referred recently to the matter of realizing on the investment, in the working of a coal mine. Attention has been drawn, by different writers, to the responsibilities that rest on the shoulders of mine superintendents, in respect to the proper working of the mine.

The story has been told of dissatisfied mine foremen who wilfully neglect their duties and give no attention to the future development of a mine required to maintain the daily output, but devote their energies to producing cheap coal in order to make a record for themselves, regardless of the burden thus thrown on the foremen who must follow them.

Mismanagement in mining is due to various causes. It may be that the foreman in charge, having a farsighted intelligence with reference to making an extraordinary record for producing cheap coal, is able to estimate how long he can stay at the game and then get away before the tonnage begins to drop.

One writer has rightly stated that

the fault of this condition lies at the door of the mine superintendent. If that official is wideawake, no foreman can play that game and get away with it safely. More than once it has happened, however, that the superintendent is as heedless to the welfare of the mine as the tricky foreman.

FOREMAN'S GAME TO SUPPLANT HIS SUPERINTENDENT FAILS

One instance that I recall resulted in both the superintendent and the mine foreman being discharged, when it was found that they were equally to blame for the deplorable condition that was found to exist in the mine. In attempting to gain the superintendent's place for himself, the wily foreman's plan for his own future protection entrapped both himself and the superintendent.

The mine was found to be in an exceptionally deplorable condition. There was water standing on the motor roads, loose slate hanging in the air-courses and travelingways; a number of stoppings had not been built and others were leaking air, all of which made it a difficult job for a new mine foreman, who would be compelled to face a heavy cost-sheet for some time to come.

At the same time, the future development of the mine, in the way of driving entries, but turning no rooms on them, had not been neglected. The tricky foreman had arranged this for his own protection, to enable him to secure a good tonnage when assuming the superintendent's place for which he had laid his plans.

PLAN OF MINE IMPORTANT TO REALIZE QUICK RETURNS

In respect to realizing quick returns on the money invested in a coal-mining proposition, the plan of mining must be laid out with that end in view. The plan adopted must be such as to conform to the requirements, which can only be determined after a careful study of local conditions.

The advancing system of mining, of course, offers the greatest inducement for quick returns. If this plan is adopted, however, the work must be carefully laid out and closely watched if trouble is to be avoided in the future development of the mine.

Today, the public are demanding cheaper fuel. In order to meet this demand, almost every superintendent and foreman is busy on his own plans; and many of these can only be considered as jokes, little thought being given to the results that are sure to follow, affecting the economy of operation.

As has been remarked by another writer, "Because a plan has proved successful in one mine or district, is no reason to assume it will be like successful in another undertaking." Just here is where many operations have failed.

In the majority of cases, failures of this kind may be the result of an inborn prejudice on the part of the mine foreman; and whether he is English, Scotch, Welsh or American, makes little difference. The mine superintendent is responsible for the mistake of adopting any plan not suitable.

One important matter to be borne in mind is the need of concentration of the work so as to reduce the cost for time and labor on the part of every one concerned. Attention has already been drawn to this point and I need not go further than to emphasize it.

Central City, Ky. OSTEL BULLOCK.

Inquiries Of General Interest

High vs. Low Voltage in Coal-Mining Practice

Safety the First Consideration in Choice of Mine Voltage —High-Tension Currents Adapted to Long-Distance Power Transmission—Low Voltage Safest Underground

ALTHOUGH quite familiar with the theoretical advantages and disadvantages involved in the use of 500 volts, over a 250-volt current, in coal-mining practice, we could not wholly satisfy a recent questioner, who is a well known coal-mining man and wanted us to tell him which of these two voltages would give him the most practical results in the mine, and which would be the most advisable to employ, in the daily operation of a coal mine.

There is, of course, less copper required to transmit a 500-volt current a given distance than is necessary in the use of 250 volts; but, against this, there must be urged the consideration of the safety of the men and security of the mine, which may prove of first importance, even from the standpoint of economy in operation. We shall be glad to see this question discussed in *Coal Age*, believing that some interesting and valuable points would thus be developed. WILLIAM L. MOORHEAD,
Moorhead Electric Machinery Co.,
Pittsburgh, Pa.

In the equipment of a mine electrically, the safety of the men employed and the security of the property become the first consideration in the choice of a working voltage. Present-day practice shows an almost invariable preference for a comparatively low voltage, and most mines are now operating on 250-volt circuits.

ECONOMY REQUIRES THAT HIGH VOLTAGE BE USED

As is well known economy of copper requires a higher voltage where the electric current is to be transmitted any considerable distance into a mine. For that purpose, a 500-volt circuit is commonly employed, on most power lines using direct current, for distribution in the mine; but such high-tension conductors require to be carefully safeguarded or protected to avoid the contact of men and animals at work in the mine.

In the electrical equipment of a large mine, where electricity is to be used to operate machines for drilling and cutting the coal, as well as to drive the motors on haulage locomotives, it is usual to install an alternating-current generator, in the powerhouse, capable of supplying a comparatively small current at a very high voltage.

For example, a 100-hp. generator can be installed to supply a current of, say 33 amp. at 2,300 volts. This will greatly reduce the cost for copper, in transmitting this current one or more miles. At the mine, a transformer is used to reduce this high voltage and a converter is employed to change the A-C to D-C current, for distribution in the mine.

There are instances where it may be preferable to use a 500-volt circuit on the haulage road, particularly in mines where men and animals are not permitted to enter on such roads. Owing to the necessity, however, of men and animals crossing these roads, at different points in the mine, the safest practice is to employ a pressure not exceeding 250 volts.

CAUTION IS THE BEST SAFEGUARD THAT CAN BE DEVISED

It is often argued, with some truth, that a 500-volt circuit is actually safer to employ than a current of 250 volts. It is explained that men, knowing that contact with a high-tension wire means instant death, while contact with a low-tension wire means only a more-or-less violent shock, are more careful to avoid contact with the former wire.

As a result of this extra caution in the presence of high-tension wires, it is claimed by some there are actually more accidents that occur in the use of low-voltage, D-C currents, than where A-C current is employed in a mine.

Notwithstanding this claim, which has not been fully substantiated in all respects, however, the general preference is for the use of a comparatively low voltage in the mine. It should be remarked, here, that every precaution must be taken to safeguard mine workers where mines are electrically equipped. The entire installation should be committed into the hands of a competent mine electrician who is familiar with mining conditions and the requirements.

Examination Questions Answered

Tennessee Mine Foremen's Examination, Knoxville, May 30-June 1, 1922

(Class A and B Questions)

QUESTION—*What are the requirements, if any, to be eligible to hold a mine foreman's certificate in this state?*

ANSWER—The Tennessee Mining Law (Sec. 14) requires applicants for certificate to give satisfactory evidence, to the Board of Examiners, in respect to good conduct, honesty, capability and sobriety, and pay an examination fee of $5 and another fee of $5 for the issuance and registration of the certificate.

QUESTION—*What penalties, if any, does the state mining law prescribe for the mine foreman who fails to do his duty while in charge of a mine?*

ANSWER—The law provides (Sec. 31), for any violation of its requirements, by any person, a fine not less than $50 or more than $500 and costs and imprisonment, at the discretion of the court.

QUESTION—*What duties does the law require of miners while working in the coal mines of this state and what are the penalties, if any, for miners who violate the law or fail to discharge their duties?*

ANSWER—The law (Sec. 31) makes it the duty of every miner to take down loose material and securely prop the roof, in his working place, when ordered to do so by the foreman. The law provides a fine of from $50 to $100, together with costs and imprisonment, at the discretion of the court, for neglecting or refusing to obey the orders of the superintendent or foreman; or for knowingly injuring any water gage, instrument, air-course, ventilating apparatus, door or brattice; or for interfering with the ventilation in an airway, or the operation of any machinery for hoisting or drainage; or for entering any portion of the mine protected by a danger signal, or performing any wilful act endangering the life or health of persons working in the mine or the security of the property.

QUESTION—*Name the different gases found in coal mines in this state and give the chemical symbol of each.*

ANSWER—The principal mine gases are the following: Methane or marsh gas (CH_4), carbon monoxide (CO), carbon dioxide (CO_2) and hydrogen sulphide or sulphureted hydrogen (H_2S).

QUESTION—*Give the common name of each of the gases, as they are called by the miners.*

ANSWER—The common name for methane is marsh gas. When mixed with air, in inflammable or explosive proportions, the mixture is called "firedamp." The common name of carbon monoxide is "whitedamp" and that of carbon dioxide "blackdamp." Sulphureted hydrogen is often called "stinkdamp," because of its disagreeable odor.

QUESTION—*What are the causes of these gases; where are they found and how does a miner detect when he is in danger from them?*

ANSWER—Marsh gas issues from the pores of the coal where it is held as an occluded gas; or escapes from the crevices and cavities of the strata where it has accumulated. It is detected by observing its effect on the flame of a safety lamp. Carbon monoxide and carbon dioxide are produced as the result of the combustion of carbon; the first, in a limited supply of air where the combustion is incomplete; and the second, in a plentiful supply of air, the combustion being then complete. The first of these two gases is extremely poisonous and its presence is best detected by observing its effect on caged mice or birds. The presence of carbon dioxide, is detected by the dim burning of the lamps or their complete extinction when more gas is present. Hydrogen sulphide is produced by the disintegration of the pyrite often contained in coal and which takes place in damp or wet places. This gas is also extremely dangerous and its presence is made known by its smell.

QUESTION—*As a mine foreman, what means would you adopt in gaseous mines to protect the workers?*

ANSWER—First, the mine workings must be thoroughly ventilated. The mine must be examined for gas and other dangers, each morning, before the men are permitted to enter for work. Where safety lamps are required, these must be of an approved type and furnished by the company. No open lights must then be permitted and all lamps must be properly cleaned, examined, filled and lighted, before being given to the men, at the beginning of the shift. Where blasting is performed in the mine, competent shotfirers must be employed and all holes examined, charged and fired that are, in their opinion, safe.

QUESTION—*What is the law in regard to operating a mine without a certified mine foreman?*

ANSWER—The law provides (Sec. 18) that any person who shall act as mine foreman, assistant foreman or gas boss, for a period of more than thirty days, without being a holder of a certificate, under the act, shall be fined $100 and costs and imprisoned not less than sixty days, at the discretion of the court.

QUESTION—*What is the law in regard to first-aid equipment in mines of this state?*

ANSWER—The law provides (Chap. 24, Sec. 1) that every operator of a coal mine shall provide and keep, in a convenient place and in a room where the things shall be well protected, a suitable stretcher, bandages, dressings and medicines for giving first-aid to the injured. These supplies must be the same or equivalent to those recommended by the First-Aid Department of the American Red-Cross Society. The act further provides a fine of from $25 to $100 for failure to comply with this requirement.

QUESTION—*How do you distinguish arterial bleeding from venous bleeding and how would you stop each?*

ANSWER—The blood coming from an artery is of a bright red color, while that from a vein is darker, owing to the absorption of the impurities from the system. In either case, in order to stop the flow from the wound, a bandage and tourniquet must be applied in a manner to press hard on the severed artery or vein, near the wound and between it and the heart, in the case of an artery; or, on the other side of the wound, in the case of a vein, the flow of blood being from the heart in the first instance and toward the heart in the second instance.

QUESTION—(a) *How would you prepare a man with a broken thigh for removal from the mine?* (b) *How would you treat a man for an electric shock?*

ANSWER—(a) The man should be laid very carefully on a stretcher, care being taken not to irritate the wound and cause fresh laceration of the flesh by the broken bones. Having adjusted the limb as carefully as possible, a long splint should be bound to the side of the body and the lower limbs, in such a manner as to prevent movement of the broken bones as much as possible. His removal from the mine must then be performed with the least possible jar.

(b) Assuming the person has been removed from contact with the live wire, he should be carried at once to where he will have the best possible air. If unconscious, artificial respiration must be given, in an effort to restore breathing, and this should be continued until the man is revived or pronounced dead by a physician. Spirits of ammonia wafted on a handkerchief will assist in reviving an unconscious person, who should be kept warm with blankets. The limbs, also, should be rubbed toward the heart to assist in restoring circulation in the body.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

THAT the revival in business is getting on more substantial grounds is indicated by figures received by the Department of Commerce up to June 20. Among the favorable features, the department reports, may be mentioned the continued increase in the iron and steel industry, which is now operating above the pre-war level; the sustained activity in the building industry, which continues to make new high records each month; the marked increase in the production of automobiles and trucks; the lower interest rates and increasing demand for money; the increase in employment and the decline in business failures. The stock market also continues active, with further increases in the prices of all classes of securities. Even the textile industry, which has been somewhat backward in recent months, showed greater activity in May.

Another matter of importance is the distinct upward trend of prices. This was more marked in May than in any recent month. In most instances the rise has not been great but it indicates a much firmer demand than has heretofore existed.

Consumption of cotton increased in May, compared with the low figures in April, but the total of 495,674 bales is still below the consumption in the closing months of 1921 or in January and March of the present year. Exports of cotton in May totaled 469,397 bales, compared with the high April figure of 612,659 bales; however, the present figure compares favorably with other months of this year and with the May exports of last year and the year before.

Pig-iron production continued to increase in May, with a total of 2,306,679 tons, or 234,565 tons more than in April. This figure is still below the 1913 monthly average but it is the largest output for any month since January, 1921.

The production of steel ingots in May, computed to 100 per cent of the industry, amounted to 3,099,155 tons, or about 300,000 tons greater than in April. Unfilled orders of the U. S. Steel Corporation at the end of May totaled 5,254,228 tons, or 157,000 tons more than the month before. This is the third consecutive month in which unfilled steel orders have increased after a period of decline lasting for more than a year and a half.

Sales of fabricated structural steel amounted to 146,900 tons in May, compared to 165,900 in April. The May figure was still in excess of any other recent month. The number of locomotives shipped by the principal producers showed a big increase in May.

The prices of all iron and steel products rose in May, in most cases reaching the highest point in more than a year.

Building contracts awarded in the 27 northeastern states totaled $362,590,000, or nearly $10,000,000 greater than in April. The square feet of floor space reported amounted to 59,639,000. This established new high records for the industry, both in value and in volume.

The production of most building materials, so far as reported, also increased in May. This was particularly true of cement, the May output amounting to 11,176,000 barrels and shipments totaling 12,897,000 barrels, thus establishing new high records in this industry.

For the first time in many months there was a substantial decrease in business failures. The total number dropped from 2,167 in April to 1,960 in May, and liabilities fell from $73,059,000 to $44,403,000. The latter figure is the lowest since last September.

Steady Gain in Automobile Output

A very large increase in the production of passenger automobiles and trucks during May is indicated by figures received by the Department of Commerce. The total production of passenger cars in May, so far reported, amounted to 231,699, compared to 197,221 in April. This is an increase of nearly 18 per cent. With a few exceptions the following table represents the production of identical firms for each month:

AUTOMOBILE AND TRUCK PRODUCTION

1922	Passenger Cars	Trucks
January	81,698	9,344
February	109,170	13,121
March	162,959	19,651
April	197,221	22,227
May	231,699	24,603

The Ford Motor Co. established a new monthly record in May with the production of 144,469 cars, trucks and tractors in all the plants, domestic and foreign. Ford company officials said that while they have no means of computing exactly what the June production will be, they are confident it will be far in excess of the May output.

Illinois Plow Industry Improves

The plow industry of Illinois is improving so rapidly that the labor force employed had to be increased 10 per cent in May in order to meet the increased demand, the State Department of Labor announces. In the 980 manufacturing plants reporting, an increase in the working force of 25,000 for May over April is shown.

Youngstown Steel Plants Busy

With automobile makers and other factories clamoring for sheet steel that branch of the steel industry in the Youngstown district last week began a schedule of operations more nearly approaching 100 per cent than at any time since the war boom. Of eight mills scheduled to resume last week seven were able to get enough skilled labor. The addition leaves only three mills of the 113 in the district idle.

Wabash Orders Equipment

The Wabash Railway Co. has placed orders for $7,000,000 worth of freight and passenger equipment for early delivery, to consist of 1,500 automobile box cars equally divided between the Pullman Company and the American Car & Foundry Co.; 750 steel hopper car bodies ordered from the Standard Steel Car Co., and 2,050 composite coal car bodies ordered from the General American Tank Car Corporation. Announcement also is made that the American Refrigerator Transportation Co. has ordered 2,000 refrigerator cars to cost approximately $5,000,000 from the American Car & Foundry Co.

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A. G. Gutheim Leaves Railway Association To Take Up Practice of Law

AUGUST G. GUTHEIM, for several years connected with the American Railway Association's car service division and previously with the car service section of the Railroad Administration in Washington, severs his connection with the A. R. A. on July 1, 1922. He will enter upon a general practice of the law in Washington.

Mr. Gutheim entered the employ of the Interstate Commerce Commission in 1908 as examiner of accounts, having previously practiced law in Cambridge, Mass., and having served the government also as a special agent in the Bureau of Corporations, since superseded by the Federal Trade Commission. During his ten years' connection with the Interstate Commerce Commission, Mr. Gutheim served successively as examiner of accounts, special agent, assistant chief of the Bureau of Inquiry, examiner and attorney examiner.

Immediately after the entrance of the United States into the World War, Mr. Gutheim took charge of the Commission's activities in car-shortage matters, acting in that capacity throughout the balance of 1917, and working also as the Commission's representative on the carriers' commission on car service then sitting in Washington as an auxiliary of the Railroad War Board. From this work he passed to the Railroad Administration immediately upon its creation, remaining with that organization throughout its existence and upon the recommencement of corporate control of the carriers becoming manager of public relations of the car service division of the American Railway Association.

AUGUST G. GUTHEIM

Freight Loadings Near Record for Year; Coal Movement Largest Since Strike

LOADING of revenue freight during the week ended June 10 totaled 846,002 cars, compared with 750,645 cars during the previous week, or an increase of 95,357 cars. This increase was largely due to the fact that the previous week included the Memorial Day holiday. There was an increase, however, of 24,871 cars compared with the week before the holiday. The loading for the week of June 10 also came within 33 cars of the largest loading for any week this year preceding the coal strike. Compared with the corresponding week last year, there was an increase of 58,719 cars, but compared with the corresponding week in 1920, the total for the week of June 10 represented a decrease of 84,974 cars.

Coal loadings, which totaled 94,824 cars, were larger than for any previous week during the strike, but represented a decrease of 67,074 cars compared with the corresponding week in 1921.

On June 8 there were 465,837 freight cars idle because of business conditions, compared with 480,266 on May 31, or a decrease of 14,429 cars. Surplus coal cars numbered 180,831, a reduction since May 31 of 14,608. A decrease of 376 was reported in the number of surplus coke cars within approximately a week, the total being 4,899.

Washington Officials See Evidences of Union Weakness in Illinois Massacre

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

A MARKED increase in production and the rioting in Illinois were the features of the coal strike last week to which most significance was attached in Washington. The troubles in Illinois came in for extended consideration at the Cabinet meeting June 23. As an outgrowth of that discussion, Labor Secretary Davis issued the following statement:

"The Department of Labor deeply deplores the violence which has resulted in loss of life in the coal fields of Illinois. American workmen on both sides of the controversy over the relations between the mine worker and the mine operator have been killed and injured. Those who are guilty of this crime should be prosecuted to the fullest extent of the law.

"One of the unfortunate features of this deplorable occurence is that the death of these men accomplishes nothing in the direction of a settlement of the dispute. Surely, those responsible for the continuance of this strike, both among the workers and among the employers, should consider the fate of these workmen. Surely, no better argument could be advanced for the settlement of these disputes around the conference table than the dead bodies of a score or more of American workmen who met a futile death in this outbreak. Surely, in this civilized age matters of dispute between men in industry can be adjusted without resort to bloodshed."

Some are inclined to attribute no small part of the responsibility for the Illinois trouble to John L. Lewis, who telegraphed to officials of the local union that the men engaged in the stripping operation should be treated as common strike breakers.

Officials who have followed many strikes see evidences of union weakness in these disorders. Such acts usually are committed only when the strain is becoming unbearable. It is held to indicate that the strikers are becoming nervous and jumpy and are no longer able to confine themselves to the limitations of an economic struggle.

Secretary Hoover announces that operators in western Kentucky continue obdurate in their refusal to co-operate with the government in the effort to prevent a runaway market. He also announces that surveys of the coal stocks and requirements of the metallurgical industries are in progress and within a short time a much more definite idea will be had as to the country's ability to continue to withstand the strike.

The threats of a railroad strike are having little influence on the buying of coal, it is believed. The general opinion is that the chances are ten to one against there being a railroad strike.

Parson Convicted of Murder in Connection With Logan County March

THE Rev. J. E. Wilburn, charged with fatally shooting a Logan County (W. Va.) deputy sheriff in the armed march of miners last August during the disturbance in that coal field was found guilty of murder in the second degree by a jury Friday evening June 23, in the Jefferson County Court, sitting at Charles Town. This is the second trial held in connection with the West Virginia mine war of last summer.

Coroner's Jury Lays Deaths of Strike Breakers in Herrin Massacre to Acts of Company Officials

MANY of the essential facts with respect to the massacre of a score of miners at the strip pit of the Southern Illinois Coal Co. near Herrin, Williamson County, Ill., by striking union miners and sympathizers may never be known. The operators of this mine, a steam-shovel pit, were engaged in an attempt to load out coal, previously uncovered, with labor not members of the United Mine Workers. They had armed guards furnished by an agency in Chicago and workers who were members of the Steam Shovelmen's Union. The force at the mine included, besides the guards and steam-shovel workers, a crew of cooks and other helpers that made the outfit self-contained.

The disturbance began Wednesday morning, June 21. State Senator Sneed, a union coal miner, wired John Lewis:

"Is there an agreement by the American Federation of Labor that the Steam Shovelmen's Union has the right to man shovels, strip and load coal? Some men here claim they have jurisdiction granted by the mining department of the American Federation of Labor. J. W. Tracy, of Chicago, district representative of the Steam Shovelmen's Union, is furnishing men to load coal in this district. We do not believe such an agreement exists. Wire answer after investigation if agreement exists and have the proper authorities stop the steam shovelmen scabbing on union coal miners."

LEWIS ADVISES TREATMENT AS OUTLAWS

Lewis' reply, which follows, was posted about the town on Wednesday:

"In reply to your wire of the 18th, the Steam Shovelmen's Union was suspended from affiliation with the American Federation of Labor some years ago. It was also ordered suspended from the mining department of the American Federation of Labor at the Atlantic City convention.

"We now find that this outlaw organization is permitting its membership to act as strikebreakers in strip mines in Ohio.

"This organization is furnishing steam-shovel engineers to work under armed guard with strikebreakers.

"It is not true that any agreement exists by and between this organization and the mining department or any other branch of the American Federation of Labor, permitting it to work under such circumstances.

"Two of our representatives have taken this question up with officers of the Steam Shovelmen's Union and have failed to secure any satisfaction.

"Representatives of our organization are justified in treating this crowd as an outlaw organization and in viewing its members in the same light as they would view any other common strikebreakers."

According to press reports of the findings of the coroner's jury on Sunday, June 25, two union miners were killed on Wednesday night, June 21, when "they visited the mine to make an investigation on behalf of the union." Whether these men were killed in the battle that raged all of Wednesday night, or prior to the open warfare, is not disclosed. There was an all-night fusillade fired on the workers besieged in coal cars and behind piles of coal and dirt, in part at least cut off from food and water. None of the besieged were killed in this attack and while exchanging shots with the strikers. During Wednesday afternoon and evening (the wires were cut that evening) the superintendent of the strip mine, McDowell, was in telephone communication with his principals in Chicago and with Colonel Hunter of the state militia, who appears to have been at Marion.

Mr. Lester, the operator of the property, was unable to interest the Governor or other high officials of the state or the state militia in sending help to the besieged men, although, according to his statements, he made many efforts by telephone in that direction. No help was sent, each state official who could act now saying that he depended on the word of Sheriff Thaxton that there would be no trouble, that he had the situation well in hand. Thaxton it was who was "called to Carbondale on urgent business" when the fight began. He is a union miner and running for election to a higher county office.

Some time Thursday morning the workers in the pit hoisted a white flag and surrendered. Up to this point it had been industrial warfare, honest fighting with two casualties, both on the attacking side—a mob, variously reported at from 1,000 to 5,000 strikers against not more than 50 strikebreakers.

After the surrender, however, it was no longer honorable warfare, if such there be, but wanton massacre. Disarmed and tied in bunches the strikebreakers were marched down the road and killed in cold blood. Shot, stabbed, clubbed and hanged, they were treated as "common strikebreakers." The bodies of 19 of their number were collected, and numerous wounded were taken to Herrin. There are many yet unaccounted for who either escaped or whose bodies have not been found.

After the massacre, the Governor, Len Small, who had been attending his trial at Waukegan, for misusing State funds, mobilized a regiment of militia in Chicago, but left them there.

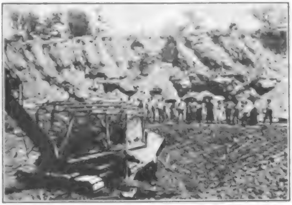
On Thursday, the Illinois Coal Operators' Association wired Frank Farrington as follows:

"Word comes to us that automobile loads of men are going from mine to mine in Southern Illinois and notifying company men and mine bosses who are in charge of properties that they must stop work in forty-eight hours. We are notifying the Governor and shall direct individual companies to give similar notification to the sheriffs in the several counties with respect to these threats. Meanwhile we are anxious to know what you as the executive head of the miners' organization in this state can and will do to prevent the possibility of any recurrence of such demonstration as occurred yesterday at the mine of the Southern Illinois Coal Co. Illinois operators are shocked at such an occurrence following twenty-five years of joint collective bargaining with the miners in Illinois."

A similar wire was sent to the Governor. At the same time F. C. Honnold, secretary-treasurer of the operators' associations, issued the following statement:

"The miners' riot of yesterday at the steam-shovel mine of the Southern Illinois Coal Co. may possibly center the thought of the public on the fact that there does exist an absolute monopoly in coal-mine labor in this state.

"The mine in question is a so-called strip or steam-shovel



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THE RUINS OF ONE OF THE STEAM SHOVELS

Destruction caused by a bomb said to have been placed by the strikers during the Williamson County massacre, in which twenty-one strike breakers are reported to have been killed.

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WRECKED SLEEPING CARS
Showing the twisted metal work of the cars in which the non-union workers lived at the mine at Herrin, Ill.

mine in which the overlying earth is removed by large revolving steam shovels. The coal thus uncovered is then loaded directly into mine cars.

"Certificated miners are not in consequence required at such mines. The operation of the steam shovels is done by members of the Steam Shovelers' Union, such additional men as are required for loading the coal, where it is handled by hand, being only common unskilled manual laborers such as might work on the highways or in the fields, or anywhere else.

"Regardless of these conditions and of the further fact that the owners of this property have repeatedly asked the appropriate authorities for protection of their plant and were finally compelled to provide their own guards, the existing labor monopoly in the state, represented by the organized miners, assaulted the plant and its workmen and as a result several men have been killed.

"A shaft or slope mine—one where men have to be carried underground to work—requires under our state law that men so employed must have a certificate of competency. The issue of these certificates is entirely under the control of the United Mine Workers. As a result no shaft mine in the State of Illinois can even start to work. If men were imported from another state, even though they were skilled and carried a certificate or other evidence of having worked in mines elsewhere, they would none the less have to submit to an examination by the Miners' Examining Board, regarding whose qualifications the state code reads as follows:

"'No person shall be appointed such miners' examining commissioner who has not had at least five years' practical and continuous experience as a coal miner and who has not been actually engaged in coal mining as a miner in the State of Illinois continuously for twelve months next preceding his appointment. . . .'

"There is in consequence no chance of any member of this board being other than a union miner.

"Illinois mines are today idle because Illinois miners will not agree to a conference for the purpose of discussing a new working agreement and scale of wages. Repeated requests have been made by the operators for such conference. The published demands of the miners which they insist must be granted before they will return to work would mean an increase in the cost of coal at mines by about $1 per ton. The Illinois coal operators believe that mine wages should be reduced to an extent that would permit of the reduction in previous cost of coal by approximately $1 per ton. Even such a decrease in the rates of pay which would permit such a reduction in the cost of coal at the mines would still enable the miners to earn in their admittedly shorter work year as much or more than is earned by workmen in other industries."

The verdict of the coroner's jury reads:

"We, the jury, find from the evidence that the deaths of decedents were due to acts direct and indirect of officials of the Southern Illinois Coal Co.

"We recommend that an investigation be conducted for the purpose of fixing the blame personally on individuals responsible."

The only man named in the verdict is a dead man, McDowell, the superintendent, who is charged with the murder of a union miner. The others came to their death at the hands of parties unknown. A sample of the testimony, taken from a press report, is as follows:

"You don't know who did the shooting, do you?" asked Coroner William A. McGowan.

"No, sir," replied the witness, a Marion policeman; "I don't know anything about it." That was the substance of his testimony and of those who followed him.

April Smokeless Output Recedes 538,610 Tons from Total for March

PRODUCTION of West Virginia smokeless coals during April, 1922, totaled 2,860,961 net tons, as compared with 1,978,153 in April last year, an increase of 882,808 tons, but a decline of 538,610 tons when compared with the output for March, 1922. April production was handled as follows: Norfolk & Western Ry., 2,061,410 tons; Virginian Ry. 517,561 tons, and Chesapeake & Ohio Ry., 281,990.

APRIL OUTPUT OF WEST VIRGINIA SMOKELESS COALS

District	In Net Tons 1922	1921	1922 Decrease	1922 Increase
Pocahontas	1,658,475	798,295	....	860,180
Winding Gulf	637,490	522,183	....	115,307
New River	162,061	431,550	269,489	....
Tug River	402,935	226,125	....	176,810
Total, April	2,860,961	1,978,153	269,489	1,152,297
Total, March	3,399,571	1,710,151	....	....

Total coal shipments, in net tons, made by these three railroads during April, with comparative March figures are as follows, by districts:

NORFOLK & WESTERN RY.

	March	April		March	April
Pocahontas	1,594,250	1,658,475	Clinch Valley	158,875	169,140
Tug River	438,230	402,935	Kenova	163,335	115,430
Thacker	505,375	491,500			
			Total	2,860,065	2,837,480

CHESAPEAKE & OHIO RY.

	March	April		March	April
Logan	1,351,840	1,278,470	Coal River	172,470	21,820
New River	513,910	121,180	Kentucky	370,510	333,090
Winding Gulf	166,580	160,810			
Kanawha	128,930	29,010	Total	2,704,240	1,944,380

VIRGINIAN RY.

	March	April		March	April
Winding Gulf	599,630	476,680	High Volatile	19,372	9,741
New River	86,971	40,881			
			Total	705,993	527,302

Navy Fuel Allowance Cut to $16,000,000

IN the naval appropriation bill for the fiscal year beginning July 1, Congress limits the fuel appropriation for the navy to $16,000,000, notwithstanding requests backed personally by Secretary Denby that $19,894,000 be given. Since the war Congress has been trying to reduce the fuel expenditures of the naval establishments. The 1921 appropriations amounted to $33,000,000 and those for 1922 amounted to $23,782,685. The estimate for next year calls for 533,119 tons of coal, 5,866,999 barrels of fuel oil, including Diesel engine oil for submarines, and 4,074,462 gallons of gasoline.

Secretary Denby told the Senate Appropriations Committee that in order to meet the reduced fuel appropriations the navy is curtailing fuel expenditures and exercising rigid economy in the use of fuel. Ships have been placed on short fuel allowances, full steaming trials have been postponed, ships are forbidden to move except for urgent reasons and many ships have been placed out of commission. Some ships are operated only eight hours a month. The Secretary pointed out, however, that steaming exercises and full-power trials must be held in order to test the motive power of ships and to train engineer forces in operating at high speeds and in the use of forced draft.

by Google

Twelfth Week of the Coal Strike

EDITORIAL REVIEW

THE twelfth week of the strike saw no definite breaks in the ranks of either the miners or operators. The miners lost much prestige and gained in ill repute through the Herrin massacre, universally condemned as a blot on union labor.

The most important event of the week having a direct bearing on a possible settlement was John Lewis' visit to Washington and his talk with President Harding. Various estimates are placed on the possible outcome of the exchange of views doubtless held, but the most sanguine can trace no sign of relenting in Mr. Lewis' formal statement issued after the event. It does not appear that the anthracite situation was discussed.

A. M. Ogle, president of the National Coal Association, and John Lewis have been exchanging compliments through the press. Mr. Ogle on June 24 issued a statement with reference to the Herrin mine massacre, saying "no words of condemnation are strong enough to characterize properly the Illinois mine outrage. . . . The pitiful part of it all is that this would never have happened but for the blindly stubborn attitude of the International officers of the United Mine Workers in refusing to accept the offers of the operators in the several states and districts to meet and negotiate wage contracts."

To this John Lewis retorted that, knowing Mr. Ogle and something of his connections, "I am not surprised that he should make such a false and vicious statement." Mr. Lewis then went over the old familiar ground of the "broken contract," charged Mr. Ogle with "doing all in his power to avoid a settlement and prolong the strike of union miners. . . . These non-union coal companies are gouging ten million dollars a week out of the pocketbooks of the coal-consuming public right now."

Mr. Ogle replied: "There can be no profit to the public in taking time now to refute the many serious inaccuracies of Mr. Lewis's latest statement. If the public is being gouged, as he claims, the one means of relief is the production of coal from union mines, and the application of this relief is entirely within the control of the International officers of the mine workers. Let them permit the idle miners and their district officers meet and negotiate agreements in the various districts."

The southern Illinois massacre is noted in many quarters as evidence of the wearing down of the miners' resistance and the inability of the leaders to hold them within bounds. On Sunday Frank Farrington issued an appeal to all the locals in Illinois pointing out that violence cannot possibly help the union cause and that already "we are in disrepute in the public mind and threatened with litigation which may cripple the union for years to come, if, indeed, the weight of it does not sink the United Mine Workers of America."

Production and prices continue upward with the crisis predicted for early in July. The deadlock in anthracite still continues, but there are certain signs of weakness on the part of the miners indicating that they may even yet agree to some form of arbitration other than on the basis of an upward adjustment only of their wages.

Former Union Official Says Strike Is Lost

THE outstanding development in the coal-strike situation in the Connellsville region last week was the open letter of William Herron, former president of the Edenborn Local of the Mine Workers, addressed to striking miners. In his letter he says "there is no chance to win" and challenges organizers to a public debate on the question. Herron claims credit for having brought the union to the Connellsville region, declaring that he worked quietly from last September, but now he says he appreciates that the strike has been lost and wants to make amends. Herron accompanied his letter with a detailed report of operating conditions throughout the region which he said he compiled by personal visits.

Late reports indicate that the gain in working forces and output continues. The H. C. Frick Coke Co. shows an increase of about 15 per cent during the past week at its operations as a whole. The Hillman Coal & Coke Co. made a gain of about 10 per cent. The American Coke Corporation now has 71 miners at work at the Orient and Martin mines, which started last week. The Republic Iron & Steel Co. has increased about 10 per cent at the Bowood mine. The Consolidated Coke Co. increased about 40 per cent in the past week as a whole. Most other companies that have been operating have made more or less gains and a number of small operations that have been idle for months are getting started.

Northern West Virginia Mines Resume; Strikers Attack Non-Union Men; 2 Dead

OPERATORS in the northern part of West Virginia are becoming more and more determined to resume operations without regard to whether there is any agreement or not and the fact that 177 mines were able to resume during the latter part of June is strengthening the determination of the operators to go ahead without waiting for a settlement of the strike. Striking miners in Harrison County on June 23 attacked between Clarksburg and Reynoldsville an interurban car filled with non-union miners and officers of the Hudson Coal Co., and under guard of deputy sheriffs. Two strikers were killed, shots ringing out in the midst of the free-for-all fight.

Baxter and Delaney Censured for Assent To Wage Reduction in Nova Scotia

BY A vote of 88 to 24, the delegates to the annual convention of the Maritime district of the United Mine Workers, held at Truro, censured President Baxter, Vice-President Delaney and Board Members McPhee and McCormack for agreeing to the reduction in wages proposed by the British Empire Steel Corporation.

These four officials of the U. M. W. met in conference with the representatives of the company at Montreal shortly before the Scott conciliation board was appointed to adjust the differences between the company and miners over the cut in wages. At this conference it was agreed that there should be a reduction in wages. Secretary J. B. McLachlan led the fight to censure the four officials on the floor of the convention. It was sought to table the resolution, but this failed and the motion went before the delegates and was supported by an overwhelming majority.

Each of the four officials spoke in his defence, stating they assumed full responsibility for their action at the Montreal conference. Each said it was a case of either accepting the wage cut or the mines would be closed utterly, or in the event of a strike strike breakers would be brought to the mines, and in view of existing industrial conditions the company would have little difficulty in working the mines, labor being abundant.

President Baxter and Vice-President Delaney said it was not honorable to strike on the job, as advocated by Secretary McLachlan. This method was entirely opposed to the principles of the U. M. W. While the vote was being taken President Baxter vacated the chair. After the vote was taken he resumed the chair, making no comment whatever.

The next motion was a demand that the Canadian Government lend $15,000,000 to the Russian Soviet Government, and this was passed without a dissenting vote. Secretary McLachlan led the fight for this resolution also and as a matter of fact McLachlan dominated the convention.

Pennsylvania Supreme Court Rules That Anthracite Tax Is Constitutional

THE Pennsylvania Supreme Court on June 24 declared constitutional the legislative act of 1921 placing a tax on anthracite coal of 1½ per cent of its value at the mines. The act is intended to bring to the state an annual revenue of about $7,500,000.

The opinion affirms the decision of the Dauphin County Court at Harrisburg, which declared anthracite and bituminous coal were different commodities and that the act taxing anthracite alone was constitutional.

Roland C. Heisler, a shareholder in the Thomas Colliery Co., who brought the original suit, contended that to tax anthracite and not bituminous was discriminatory because they came in competition with each other. The tax law went into effect July 1, last.

Cushing Resigns Managing Directorship of American Wholesale Coal Association

GEORGE H. CUSHING has resigned as managing director of the American Wholesale Coal Association. He submitted his resignation to the executive committee of the association at the meeting in New York on June 22, 1922. It is reported that his resignation was accepted only after half a day of discussion by the executive committee. It is understood that the association will maintain the Washington office and that Mr. Cochran, traffic expert for the association, will continue in office, with headquarters in Washington. No change in policy has been announced by the assocation as the result of this action. In a statement given out after the meeting of the executive committee, Mr. Cushing said:

"I suspended my editorial work, at the earnest solicitation of your board of directors, in order to undertake one particular task which you desired done—to establish in the public mind an understanding and appreciation of the value of the wholesaler to the community. The progress made is gratifying even though the whole task is by no means finished.

"Soon after moving to Washington, I realized that only the richer and more powerful associations could afford the luxury of Washington representation on the scale on which yours has been maintained. Had it not been for matters then pressing for attention I would have taken this action a year ago or two years ago. I now feel that you can afford to function on a less expensive plan.

"I can, personally, no longer afford to abandon my own profession or depend upon the support of a voluntary association. I ask, therefore, that my resignation be accepted. In doing so, I ask you gentlemen to convey to the members my hearty appreciation of their cordial support through three and a half years and to say to them that I am always at the service of the association. I wish it might be conveyed to the members also that my firm conviction is that while the same work will be done with less expense in future, it will not suffer in effectiveness on that account."

The executive committee, upon accepting Mr. Cushing's resignation, adopted the following memorial:

"We are forced to recognize the cogency of the reasoning of George H. Cushing in presenting his resignation. We recognize the accuracy of his analyses of the situation—that we cannot indefinitely continue the Washington office on the present scale of expense. We are forced to recognize also that it is an injustice to ask him longer to absent himself from his chosen vocation.

"We therefore consent reluctantly to the severance of our relations. In doing so, we wish to say to his friends and to our friends that:

"First—In dealing with the public, he has lived true to the best traditions of his profession and has won friends steadily for the industry he represented.

"Second—In dealing with the public officials he has shown a steadfastness of courage, mixed with a proper degree of diplomacy, which has advanced his cause by compelling respect for it.

"Third—In carrying out the purposes and wishes of the executive committee, he has displayed great energy, initiative and resourcefulness.

"Fourth—We desire to record our appreciation of his loyalty and devotion to this association and to express our thanks for his assurance of his future co-operation and support.

"Fifth—We wish to assure him in turn of our sincere hope for him that he may enjoy unlimited success in his future work."

April Coal Consumption by Roads Less Than Last Year; 4 Months Total Lower

CLASS 1 railroads consumed 7,606,931 net tons of coal in April, as compared with 7,772,171 tons in the corresponding month last year, according to a report by the Bureau of Statistics of the Interstate Commerce Commission covering 181 freight roads and 178 passenger roads, and including the equivalent coal tonnage for all consumed. April shows a falling off in railroad fuel consumption as compared with March, 1922 (9,293,029 tons), and March, 1921 (8,470,575 tons). Coal-consumption in the first quarter of 1922 amounted to 26,749,260 net tons, slightly less than during the corresponding period of 1921, when 26,969,315 tons was consumed. During the four months ended April 30, 1922, these railroads consumed 34,386,114 tons as compared with 34,762,917 tons in the corresponding period of 1921.

Railroads' Coal Stocks Shrink from 94 to 75 Days' Supply in a Month

RAILROADS in the United States had on June 1 in stockpiles or in cars 10,847,000 tons of bituminous coal according to a report just issued by the American Railway Association. The average daily consumption for the month of May by carriers of this coal approximated 284,000 tons, of which 145,000 tons per day, on average, was being taken from stock on hand.

Based upon the total average daily consumption, including the product of operating mines, the carriers' position showed that they had on hand on May 1 94 days' supply and on June 1 75 days' supply, on the average.

The following statements showing the information on the carriers as a whole are self explanatory:

Month	Total Consumption	Consumed From Current Coal Received	Consumed from Stock
April	8, 50,000	3,550,000	4,800,000
May	8,520,000	4,320,000	4,200,000

Day	Stocks On Hand	Total Daily Average Consumption	Daily Average Consumption From Stock	Days Supply On Hand (*)
April 1	19,843,833	271,000	....	..
May 1	15,052,268	278,000	160,000	94
June 1	10,846,567	284,000	145,000	75

(*) Based only upon that portion being actually taken from stock piles at the rate established during April and May respectively.

Conciliation Board Recommends Wage Cut Of 30 Per Cent in Southern Alberta

THE majority and minority reports of the Board of Conciliation in the wage dispute between the Western Canada Coal Operators' Association and the miners of southern Alberta have been made public. The majority report, signed by W. E. Knowles, of Moose Jaw, chairman of the board, and E. Ostlund, of Lethbridge, miners' representative, recommends a reduction of approximately 30 per cent of the rates in effect when work ceased on March 31. The minority report of R. G. Drinnan, coal operator, representing the employers, proposes a reduction of from 37 to 40 per cent on the wages of the late agreement.

The precipitous decline which occurred in April this year is, of course, attributed to the effect of the coal strike on the country's traffic. During April the net revenue and non-revenue freight ton-miles declined to 24,723,000,000 from 25,591,000,000 in April of last year.

Speculation Rife on Probable Strike Settlement Following White House Conference

PRESIDENT HARDING on Monday conferred with Secretary of Labor Davis and John L. Lewis, president of the miners' union, on the coal strike. The White House conference preceded a morning session with Secretary Davis and a long session Sunday night by invitation of the Secretary of Labor in an effort by the Administration to end the coal deadlock, now rounding out the third month of its duration.

Mr. Lewis was the only party to the conference who would make a statement following the session with the President, in which the visitors lunched with the Chief Executive. The admission by Lewis that the merits of district conferences were discussed lent color to the feeling that this method of settling the strike might eventually be adopted in view of the oft-repeated determination of the operators not to meet in national conference and the desire of the Administration not to request such a meeting. Mr. Lewis said, however, that no definite conclusion has been reached and intimated that he might make a more detailed statement later. He said that various factors in the coal situation, including its overdevelopment, were discussed. Mr. Lewis stated that the miners would not return to work pending the outcome of any conferences which might be held.

The following is the formal statement of Mr. Lewis:

"The Secretary of Labor and myself had luncheon with the President, followed by a discussion of one and a half hours relating to the general problem of the bituminous-mine industry and the present strike situation. We discussed the problems of overdevelopment in the mining industry, with its excess number of mining operations and excess number of men employed, the intermittency and inadequacy of employment of mine workers, and various questions affecting the stabilization of the industry.

"With relation to the present strike, we considered the matter of a joint conference of representative operators and miners, and the merits of district joint conferences as related to the usual procedure of Central Competitive Field conferences or a national conference. No definite plans were decided upon."

Injunctions Against Intimidation Granted in West Virginia and Maryland

JUDGE GEORGE W. McCLINTIC, of the U. S. District Court for the southern district of West Virginia, has granted an injunction to the Anchor Coal Co. and 69 other coal companies operating in the Kanawha field which sought relief from interference with and intimidation of miners who desire to work. About 149 persons, including officials of the International and District 17 organizations of the United Mine Workers, were named as defendants.

This restraining order embraces all parts of the Kanawha region, including all mines on Big and Little Coal rivers, Paint Creek, Cabin Creek, Morris Creek and Armstrong Creek; all mines on the main line of the C. & O. and those at Mt. Carbon and St. Albans.

Judge McClintic will hold a hearing on the temporary restraining order on June 29 at 10 a.m.

As a result of the recent outbreak near Westernport, Md., when striking coal miners attacked non-union miners, Judge John C. Rose of the U. S. District Court has granted two preliminary injunctions, one on the application of the West Virginia Pulp & Paper Co. and the other upon the application of the R. J. Ross Coal Mines, Inc. The orders name as defendants about 60 persons, alleged to be members of the United Mine Workers of America. Under the terms of the injunctions they are enjoined from in any way intimidating or interfering with the employees of the plaintiff companies or from trespassing on their properties.

Disarming of Utah Strikers Proceeds Quietly; Resumption May Cause Trouble

THE Utah National Guard is still in charge in the Carbon County coal fields and the work of disarming the strikers is proceeding quietly. Wives and mothers in the martial-law zone have taken the lead in many cases in turning in the guns of their men folk to the authorities. Eleven of the men who were involved in the recent firing on a coal-mine train in which a deputy sheriff was killed and others injured are to face a murder charge. In a raid at Helper the guards found large quantities of liquor and wine, which they confiscated.

It is declared that the number of weapons received by the guardsmen so far would indicate that Carbon County was quite an arsenal. There is an unconfirmed rumor that miners will be brought in and the mines started again on a 100-per cent basis within a short time. The military authorities declare there is likely to be trouble if such an attempt is made to break the strike. At present conditions are very peaceful despite the fact that the military authority is using vigorous measures in its handling of the situation.

Commerce Chamber Asks Members' Aid To Avert Runaway Coal Market

JULIUS H. BARNES, president of the Chamber of Commerce of the United States, has called upon 1,400 business organizations within the chamber to lend their co-operation in helping to prevent a runaway coal market by appointing fuel committees to make a survey of the local coal situation.

In a letter urging such action Mr. Barnes calls attention to the fact that "while Secretary Hoover's plan has thus far proved effective and coal men are endeavoring to prevent runaway prices, the ultimate success of the plan depends upon the co-operation of the consumer himself. Appreciative of the consumer's responsibility in this matter, Mr. Hoover suggested to the public utilities, railroads and metallurgical industries that they each appoint a buyers' committee authorized to secure and distribute such coal as is needed by the operating plants in the respective industries represented. We are advised that active steps are being taken to make this plan effective.

"While these industries are the three largest group users of coal, there are many other industrial and individual consumers whose needs must receive consideration. Owing to the varied character and widely scattered location of these consumers, their interests can best be represented by their local chambers of commerce and trade associations with whom they are associated or with whom they can make contact."

"In view of a possibility of the strike continuing until depletion of stocks becomes serious," he said, "I believe that in the general public interest this situation should be anticipated as much as possible. In the absence of other machinery and in view of a possible emergency, I suggest that you appoint a fuel committee to survey the conditions relative to stocks on hand and needs in your community or industry and, further, that this information be compiled so that in event the situation does become serious, it can be used in any plan involving a distribution of available coal."

Production and the Market

Weekly Review

HESITANT and uncertain, the bituminous-coal market jumped up and down last week in sympathy with rumors of impending settlement, action of some sort by the administration at Washington spurred on by the Herrin mine massacre, and by the holding back of orders in anticipation of reductions of freight rates effective July 1. The trade appreciates that the crisis is approaching, when stocks will be so low that the non-union output will fall so far short of meeting current requirements that there will be no such thing as holding the situation in check.

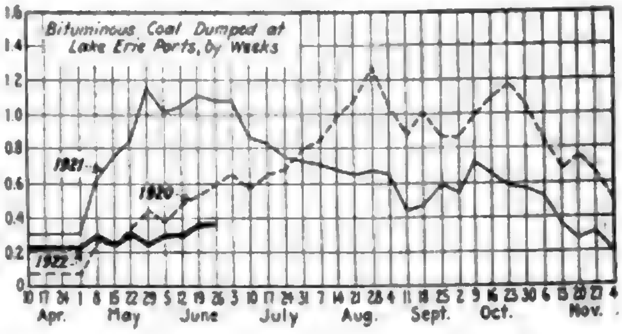
The net result of the fluctuations in the market is reflected in the increase by the end of the week and on Monday, June 26, of a ten-point gain in *Coal Age* Index, which now stands at 284, corresponding to an average price of $3.44 per net ton at the mine for the seven coals that are now produced and marketed out of the fourteen normally covered.

RAILROADS ENLIVEN MARKETS WEST OF PITTSBURGH

West of Pittsburgh the market made considerable gains last week, the railroads being the most important influence. The price of western Kentucky coal reached a new high level, passing the $4 mark, and an opening was thus made for additional sales of Alabama coal. Railroad buying centering in St. Louis and Chicago was responsible for this demand for western Kentucky coal but the railroads withdrew when the price reached this level and centered their attention on eastern Kentucky. As yet the iron and steel interests, railroads and public utilities are the only buyers of consequence in the market, general industry having shown no interest in coal since the strike began.

Northwestern buyers, however, are alarmed at the dwindling dock stocks and slow replenishments, and the general run of consumers, following the lead of railroads and utilities, are now in the market. Dock companies have been able to sell most of their surplus tonnage and in many cases have withdrawn their quotations, holding some tonnage for old customers. Despite this activity, prices have not advanced, due to the stabilizing tactics of some of the larger sellers.

New England presents the reverse side of the market. Midsummer dullness has halted buying and very little is to be expected even after July 1. There are ample supplies throughout this territory and buyers are enabled to await the lower mine prices which they believe will follow the buying rush after the new freights become effective. Hampton Roads is supplying so much tonnage to North Atlantic centers, at prices below the Hoover maximum, that the Pennsylvania rail coals, although very scarce, are not in position to be advanced, although enough line demand exists to keep these quotations very firm.

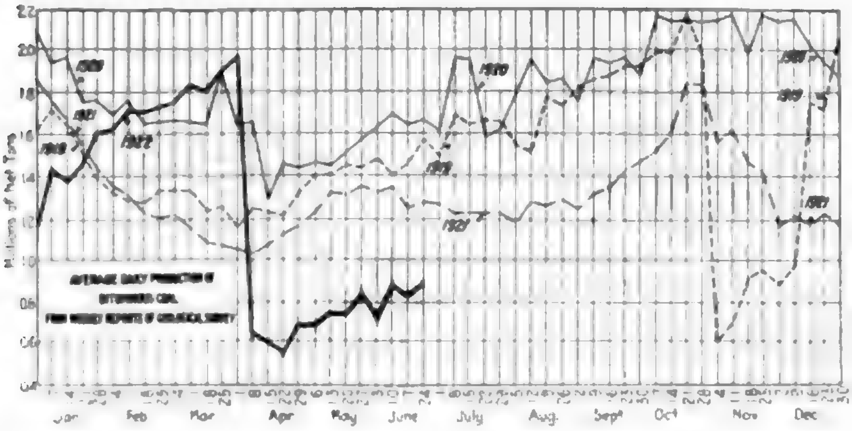


For the first time in several years no export tonnage cleared from Hampton Roads last week. Two cargoes of British coals are reported on the way to this country.

Production, which reached five and a half million tons last week, the twelfth of the strike, showed gains in the non-union fields of central Pennsylvania and in northern West Virginia.

Anthracite domestic is becoming scarce at retail, but the consumer is not uneasy. More orders are being placed, however, for delivery after the strike.

Steam sizes at the mines are either booked up or have



Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1921	1922
June 3	6,835,000	4,616,000
June 10 (b)	8,010,000	5,134,000
June 17 (a)	7,551,000	4,986,000
Daily average	1,259,000	831,000
Calendar year	181,102,000	177,234,000
Daily av. cal. yr.	1,279,000	1,244,000

ANTHRACITE

June 3	1,573,000	8,000
June 10	1,963,000	13,000
June 17 (a)	1,941,000	22,000

COKE

June 10	58,000	98,000
June 17 (a)		101,000
Calendar year		2,986,000

(a) Subject to revision (b) Revised from last report.

all been shipped. This is strengthening the market for coal dredged from the rivers and production of this fuel is rapidly increasing.

BITUMINOUS

"Production of soft coal has taken a sharp upward turn in the twelfth week of the strike," says the Geological Survey. "The record of the first four days indicates that the output will be well above the 5,000,000-ton mark and may approach 5,500,000 tons. Production of anthracite remains practically zero.

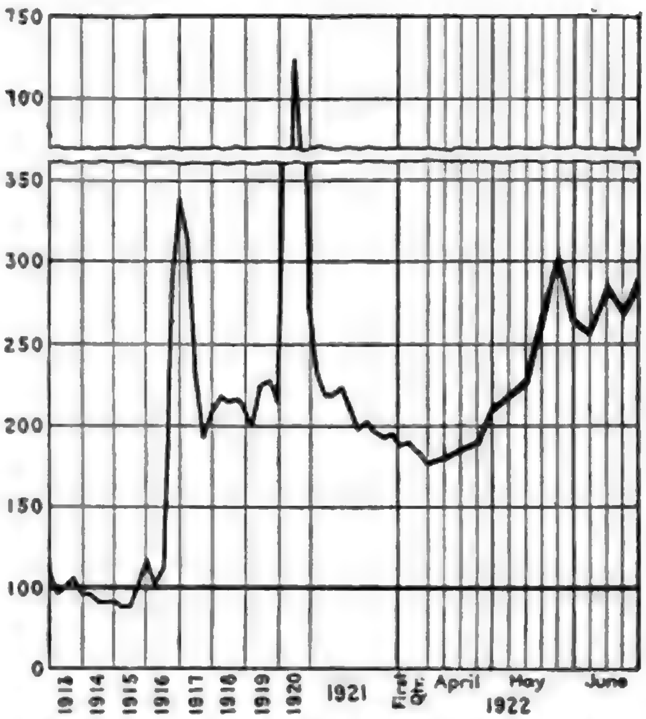
"Complete returns on the eleventh week (June 12-17) show a production of 4,986,000 tons of soft coal and 22,000 tons of anthracite. The total coal raised was thus 5,008,000 tons. A year ago the total output of all coal, including anthracite, was 9,490,000 tons. In the year of active business, 1920, it was 11,950,000 tons. Regarding anthracite and bituminous coal as a common supply of fuel, it will be seen that the quantity of coal now being mined weekly is about 6,000,000 tons below normal.

"The record of the twelfth week (June 19-24) shows a prompt recovery from the traffic congestion which had interfered with the placement of cars at mines in eastern Kentucky and parts of West Virginia. Loadings on Monday were reduced by the observance of a religious holiday and amounted to only 15,206 cars. On Tuesday, however, a sudden increase carried loadings to the highest point reached since the strike began—16,561 cars. But this figure was again exceeded on Wednesday when 17,010 cars were loaded. As a result production for the week is expected to be somewhere between 5,300,000 and 5,500,000 tons.

DAILY LOADINGS DURING THE STRIKE

	First Week	Seventh Week	Eighth Week	Ninth Week	Tenth Week	Eleventh Week	Twelfth Week
Monday	11,445	13,366	14,772	15,058	14,597	15,474	15,206
Tuesday	11,019	12,850	15,085	11,056	15,269	15,849	16,561
Wednesday	11,437	13,422	14,677	15,222	15,999	14,905	17,010
Thursday	11,090	13,445	14,573	13,790	16,325	14,884	16,417
Friday	11,296	14,036	15,202	14,523	15,864	13,933	. . . .
Saturday	8,888	12,357	12,662	12,545	13,991	13,465	. . . .

"The increased production comes not from any of the strongly organized fields but results from a gradual return to work in non-union fields affected by the strike and from increased activity in districts of the Far West where demand has hitherto been insufficient to call out full production. The accumulations of unbilled loads is still declining and the draft upon consumers' stockpiles continues."



Coal Age Index 284, Week of June 26, 1922. Average spot price for same period $2.44. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh District, Illinois, Indiana and eastern Ohio prices not included in figures for last week.)

Lake dumpings were 390,796 net tons during the week ended June 26—376,083 tons cargo and 14,713 tons vessel fuel—as compared with 388,378 tons during the preceding week. Dumpings for the season to date are 3,429,926 tons, as compared with 9,115,768 tons for the corresponding period of last year. Lake Erie ports continue to take a heavy tonnage. More than 26 per cent over the shipments for the season to May 31 went to these destinations, as compared with the less than 1 per cent in the last two years. Interest in the Lake market is rapidly increasing, as with the season so far advanced and but little coal moved a shortage is looming as an unwelcome reality.

All-rail shipments to New England are hovering around 500 cars per week. There is no market in that section for

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	May 29, 1922	June 12, 1922	June 19, 1922	June 26, 1922†
Smokeless lump	Columbus	$3 55	$3 75	$3 50	$3 50@$3 75
Smokeless mine run	Columbus	3 40	3 50	3 30	3 35@3 50
Smokeless screenings	Columbus	3 25	3 20	3 15	3 25@3 40
Smokeless lump	Chicago	3 40	3 65	3 25	3 50@3 75
Smokeless mine run	Chicago	3 15	3 40	3 10	3 25@3 50
Smokeless lump	Cincinnati	3 40	3 65	3 55	3 50@3 75
Smokeless mine run	Cincinnati	3 15	3 40	3 40	3 35@3 50
Smokeless screenings	Cincinnati	3 00	3 00	3 15	3 00@3 25
*Smokeless mine run	Boston	6 15	6 65	6 10	6 05@6 15
Clearfield mine run	Boston	3 15	3 25	3 05	3 15@3 40
Cambria mine run	Boston	3 65	3 75	3 50	3 50@3 75
Somerset mine run	Boston	3 40	3 25	3 20	3 25@3 50
Pool 1 (Navy Standard)	New York			4 40	4 40@4 50
Pool 1 (Navy Standard)	Baltimore			4 00	3 50@4 00
Pool 9 (Super Low Vol.)	New York	3 80	4 00	4 05	4 25@4 50
Pool 9 (Super Low Vol.)	Philadelphia	3 60	4 05	4 30	4 00@4 60
Pool 9 (Super Low Vol.)	Baltimore	3 25	4 25	3 85	3 50@4 00
Pool 10 (H.Gr.Low Vol.)	New York	3 60	4 00	3 80	3 75@4 35
Pool 10 (H.Gr.Low Vol.)	Philadelphia	3 25	3 75	4 00	3 75@4 25
Pool 10 (H.Gr.Low Vol.)	Baltimore	3 25	3 75	4 00	3 50@4 00
Pool 11 (Low Vol.)	New York	3 25	4 00	3 50	3 60@3 90
Pool 11 (Low Vol.)	Philadelphia	2 75	3 50	3 75	3 50@4 00
Pool 11 (Low Vol.)	Baltimore	3 05	3.75	3 50	3 80@4 00
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	3 10	4.00	3 65	3 75@4 00
Pool 54-64 (Gas and St.)	Philadelphia	2 75			
Pool 54-64 (Gas and St.)	Baltimore	3 00	3 80	3 50	3 50@4 00
Kanawha lump	Columbus	3 45	3 65	3 35	3 50@3 75
Kanawha mine run	Columbus	3 25	3 40	3 25	3 25@3 50
Kanawha screenings	Columbus	3 10	3 15	3 25	3 15@3 40
W. Va. Splint lump	Cincinnati	3 40	3 50	3 35	3 50
W. Va. Gas lump	Cincinnati	3 30	3 50	3 35	3 50

	Market Quoted	May 29, 1922	June 12, 1922	June 19, 1922	June 26, 1922†
W. Va. mine run	Cincinnati	$3 10	$3 25	$3 00	$3 25@$3 50
W. Va. screenings	Cincinnati	3 10	3 15	2 90	3 00@3 25
Hocking lump	Columbus	3 60	3 65	3 35	3 50@3 75
Hocking mine run	Columbus	3 55	3 40	3 10	3 40@3 50
Hocking screenings	Columbus	3 55	3 15	3 15	3 40@3 50
Pitts. No. 8 lump	Cleveland		4 00	4 00	3 90@4 00
Pitts. No. 8 mine run	Cleveland	3 25	3 70	3 70	3 75@4 00
Pitts. No. 8 screenings	Cleveland	3.25	3.70	3.70	3.75@4 00
Midwest					
West Ky. lump	Louisville	3 20	3.75	3 85	4 00@4 15
West Ky. mine run	Louisville	3 20	3.75	3 80	4 00@4 15
West Ky. screenings	Louisville	3 20	3.75	3 80	4 00@4 15
West Ky. lump	Chicago	3 10	4.15	3.75	4 10@4 25
West Ky. mine run	Chicago	3.10	3.95	3.75	4.10@4.25
South and Southwest					
Big Seam lump	Birmingham	2 00	2 20	2 20	2 15@2 25
Big Seam mine run	Birmingham	1 70	1 85	1 85	1 85@2 00
Big Seam (washed)	Birmingham	1 85	1 85	1 85	1 75@2 00
S. E. Ky. lump	Chicago	3 10	3.75	3.50	3 50@3 75
S. E. Ky. mine run	Chicago	3.10	3.50	3.25	3.25@3 50
S. E. Ky. lump	Louisville	3.10	3.75	3 75	3 50@3 75
S. E. Ky. mine run	Louisville	3 10	3 50	3 25	3 25@3 50
S. E. Ky. screenings	Louisville	3 10	3 25	3 10	3 25@3 30
S. E. Ky. lump	Cincinnati	3 30	3 50	3 50	3 75
S. E. Ky. mine run	Cincinnati	3 15	3 40	3 05	3 15@3 50
S. E. Ky. screenings	Cincinnati	3 15	3 15	2 85	3 00@3 25
Kansas lump	Kansas City	4 25	5.00	5 00	5 00
Kansas mine run	Kansas City	4 20	4 25	4.25	4 00@4 50
Kansas screenings	Kansas City	2 75	2.85	2.95	3 00@3 30

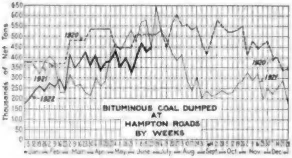
*Gross tons, f. o. b. vessel, Hampton Roads.

†Advances over previous week shown in **heavy type**, declines in *italics*.

NOTE—Smokeless prices now include New River and Pocahontas.

this comparatively high-priced coal and but little is moving aside from contract shipments.

Dumpings at Hampton Roads for all accounts were 450,231 net tons during the week ended June 22, as compared with 436,736 tons during the previous week. Heavy movement of this coal continues to New York, Philadelphia and Baltimore, but New England shipments are gradually being reduced to contracts. Mine prices on the Southern coals are being kept well within the Hoover limit. So far as New England is concerned, the outlook for July does not indicate that this price level will even be reached. Coastwise freights remain soft.



ANTHRACITE

Production of anthracite is still confined to steam sizes dredged from the rivers. During the week ended June 17 this output was increased to 22,000 net tons, as compared with 13,000 tons in the preceding week. The scarcity of steam sizes is increasing the dredging operations and strengthening the price of these coals.

Retailers are getting low on domestic sizes and are not making deliveries unless the coal is urgently needed. Many are only accepting orders for delivery after the strike. Such orders are increasing and a busy period is sure to follow the resumption of mining. Hard coal is moving better in the Northwest, where consumers are faced with a probable shortage this winter unless the Lake movement can be speeded up after the strike.

Anthracite stocks in Massachusetts were 535,412 net tons on June 1, as compared with 726,611 tons on hand April 1, according to a report published by the State Fuel Administrator, which shows that sales of hard coal since the inauguration of the strike to June 1 were 516,312 tons. Deliveries during 1921 were 5,243,415 tons, so that dealers had more than a 30-day average supply on hand at the outset of June. These proportions are fairly constant in the case of the Metropolitan Boston District, which had 201,029 tons on hand June 1, 264,539 tons as of April 1, and during 1921 distributed 2,142,599 tons.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Apr. 1, 1922 Inclusive	April 3 to June 10, 1922 Inclusive	Week Ended June 10
U. S. total	45.6	55.7	....	....
Non-Union				
Alabama	63.5	64.6	....	....
Somerset County	55.5	74.9	44.7	36.4
Panhandle, W. Va.	55.3	51.3	40.7	48.4
Westmoreland	54.9	58.8	79.9	91.5
Virginia	54.8	59.9	78.8	91.3
Harlan	53.3	54.8	....	....
Hazard	51.7	58.4	62.0	72.5
Pocahontas	49.8	60.0	75.2	74.3
Tug River	48.1	63.7	81.9	88.2
Logan	47.6	61.1	76.3	78.2
Cumberland-Piedmont	46.6	50.6	15.3	16.7
Winding Gulf	45.7	64.3	71.6	78.8
Kenova-Thacker	38.2	54.3	79.1	84.1
N. E. Kentucky	32.9	47.7	61.4	69.8
New River‡	24.3	37.9	19.8	44.2
Union				
Oklahoma	63.9	59.6	14.2	13.6
Iowa	57.4	78.4	0.0	0.0
Ohio, Eastern	52.6	46.6	0.0	0.0
Missouri	50.7	66.8	1.0	3.3
Illinois	44.8	54.5	0.0	0.0
Kansas	42.0	54.9	12.2	17.7
Indiana	41.4	53.8	0.0	0.0
Pittsburgh†	41.2	39.8	0.0	0.0
Central Pennsylvania	39.1	50.2	11.6	12.6
Fairmont	35.3	44.0	5.0	6.9
Western Kentucky	32.5	37.7	57.7	77.0
Pittsburgh*	30.4	31.9	0.0	0.0
Kanawha	26.0	13.0	3.8	9.1
Ohio, southern	22.9	24.3	0.0	0.0

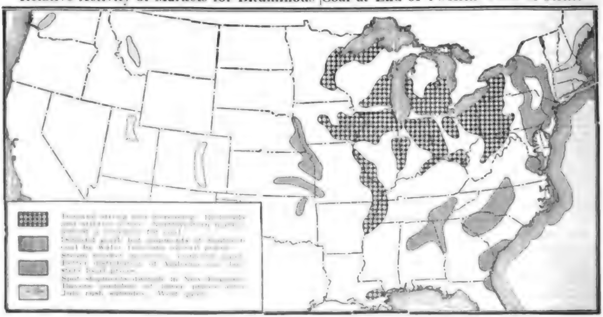
*Rail and river mines combined.
† Rail mines.
‡ Union in 1921, non-union in 1922.

COKE

Production of beehive coke was 101,000 net tons during the week ended June 17, an increase of 3,000 tons over the previous week. The increase centered in the Connellsville region.

The heavier production is confined for the most part to furnace ovens of steel interests, and merchant offerings remain very light. Prices are up still further, as blast furnaces inquire for tonnage. Some 200 independent Connellsville ovens were relighted last week.

Relative Activity of Markets for Bituminous Coal at End of Twelfth Week of Strike



Foreign Market And Export News

British Production Lowest Since Strike; Supply in Excess of Demand

Production of coal declined to 2,441,000 gross tons during the week ended June 10, according to a cable to *Coal Age*, as compared with 4,411,000 tons during the preceding week. This is the lowest weekly output since the 1921 strike and was caused by observance of Whitmonday, a national holiday, and the fact that coal supplies now greatly exceed the demand. Prices had a lower range last week.

The coal trade in the north of England is very slack. Nearly all sections of the market are weak with the exception of best steam coals. This slackening is particularly noticeable in the foreign market. In Scotland the trade is still uncertain though not so weak in proportion as that of the north of England.

The miners' leaders are just beginning to realize the causes of the present depression in the coal industry with the consequent unemployment and the low level of miners' wages. Not only is the situation in Britain, such as the engineering dispute and the slackness in the iron and steel trades, having an adverse effect on the coal industry but also the instability of the financial situation on the continent of Europe renders the majority of Britain's former customers unable to purchase coal at the prices desired by British owners.

One of the miners' leaders in the Rhondda district of Wales estimates that there are 50,000 miners at present unemployed, and that of those at work 50,000 are earning not more than 30s. per week.

A special meeting of the executive of the Miners' Federation will be held in London on July 6 and 7, when the wage question will be considered, with the object of drafting a policy for submission to the annual conference at Blackpool in mid-July.

French Miners Refuse Wage Cuts

The meeting held in Douai on June 7 between coal owners and miners' delegates broke off without result, the miners' representatives declaring that the men would not consent to any increase of their working time nor to any decrease of their wages. To find outlets for the gradually recuperated production of the devastated mines, French collieries must absolutely obtain lower inland transportation rates, and bring down their cost prices either by an increase of individual output or by a reduction of wages.

A lesser pressure of British coals, due to the United States strike, has recently eased the situation to a small extent; but, of course, this is but a transient occurrence.

The price of metallurgical coke (mostly German reparation) delivered to French blast furnaces has been maintained at 90 fr. at the Franco-German frontier for the month of June, but will be most likely increased next month.

Hampton Roads Pier Situation

	— Week Ended —	
N. & W. Piers, Lamberts Point:	June 15	June 22
Cars on hand	3,050	2,826
Tons on hand	161,531	147,102
Tons dumped	190,382	190,743
Tonnage waiting	30,000	25,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,839	2,022
Tons on hand	91,950	109,550
Tons dumped	96,258	105,077
Tonnage waiting	15,000	10,000
C. & O. Piers, Newport News:		
Cars on hand	1,412	1,576
Tons on hand	87,500	87,450
Tons dumped	103,303	106,172
Tonnage waiting	7,500	6,500

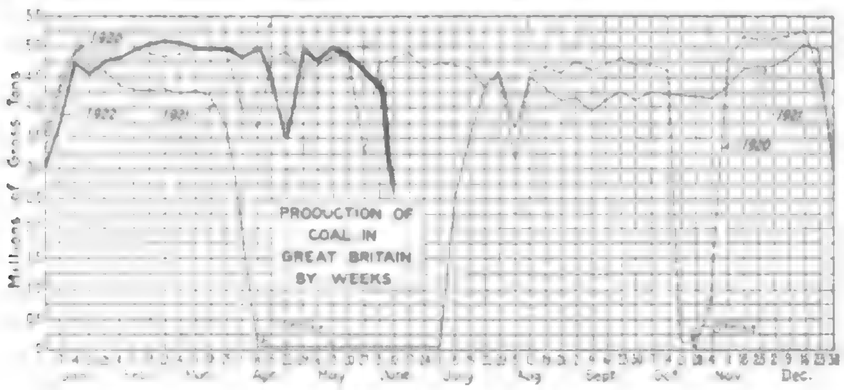
Coal Paragraphs from Foreign Lands

ITALY—The price of Cardiff steam first is quoted at 37s. 9d., according to a cable to *Coal Age*. Last week's quotation was 38s. 3d.

GERMANY—Production in the Ruhr district during the week ended June 10 was 1,447,000 metric tons, according to a cable to *Coal Age*. The output for the preceding week was 1,740,000 tons.

JAPAN—March output of coal was 3,211,734 tons, a slight decrease as compared with March, 1921. The first quarter's output of 1922 was 6,155,971 tons.

MAY EXPORTS FROM THE UNITED STATES, according to the Bureau of Foreign & Domestic Commerce, were 60,860 tons of anthracite, 399,551 tons of bituminous coal and 21,798 tons of coke, as compared with 434,308, 2,500,374 and 15,641 tons, respectively, for the corresponding month of 1921. One export cargo cleared from the United States in the week ended June 23, being the S. S. Orinoco, for Rio de Janeiro, Brazil, 8,059 tons.



Less Activity at Hampton Roads

No ship cleared for export last week, the first time this has been true for many years. The average for export has been gradually reduced to nothing over several weeks.

At the end of the week dumpings were slackening, although the average for the month to date was slightly above the record for a similar period of the previous month. Prices showed a tendency to weaken. Big buyers were not in the market, apparently awaiting the freight rate reduction July 1.

French Coal Statistics for April

PRODUCTION

Fields	(Metric Tons)
Pas-de-Calais (non-devastated mines)	615,129
Nord and Pas-de-Calais (devastated mines)	586,740
Center	606,760
Southern	349,908
Alsace-Lorraine	301,520
Small Ronchamp	8,548
Western	10,528
Total coal production	2,479,133
Production of coke	60,739
Production of briquets	182,516

IMPORTS

Coal, from	
Sarre	294,864
Great Britain	900,962
Belgium	154,348
United States	3,846
Germany	125,181
Holland (probably in transit from Germany)	56,056
Various countries	3,046
Total coal imports	1,538,303
Total coke imports	425,949
Total briquet imports	88,831

The above figures are those officially published by the French Customs Authorities. As regards imports from Germany (on reparation account), they are often at variance with figures obtained from other sources. For instance, according to that second source, France received in April from Germany: 486,000 tons of coal, 410,000 tons of coke, and 35,000 tons of lignite briquets.

Pier and Bunker Prices, Gross Tons

PIERS

	June 17	June 24†
Pool 9, New York		
Pool 10, New York	$7.50@$7.75	*$7.25@$7.50*
Pool 9, Philadelphia	7.35@ 8.00	**7.65@ 8.10**
Pool 10, Philadelphia	7.00@ 7.25	**7.25@ 7.60**
Pool 71, Philadelphia	8.25	**8.35**
Pool 1, Hamp. Rds.	6.25@ 6.40	*6.00@ 6.15*
Pools 5-6-7 Hamp. Rds.	6.25@ 6.50	*6.00@ 6.50*
Pool 2, Hamp. Rds.	6.50	*6.00*

BUNKERS

	June 17	June 24†
Pool 9, New York		
Pool 10, New York	$7.50@$7.80	*$7.50@$7.75*
Pool 9, Philadelphia	7.60@ 8.25	7.60@ 8.25
Pool 10, Philadelphia	7.50@ 8.00	7.50@ 8.00
Pool 1, Hamp. Rds.	6.25@ 6.50	*6.00@ 6.25*
Pool 2, Hamp. Rds.	6.25@ 6.50	*6.00*
Welsh, Gibraltar	43s. f.o.b.	43s. f.o.b.
Welsh, Rio de Janeiro	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Welsh, Lisbon	43s. f.o.b.	43s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	42s. t.i.b.	42s. t.i.b.
Welsh, Messina	41s. f.o.b.	*39s. f.o.b.*
Welsh, Algiers	38s. 6d. f.o.b.	38s. 6d. f.o.b.
Welsh, Pernambuco	65s. f.o.b.	65s. f.o.b.
Welsh, Bahia	65s. f.o.b.	65s. f.o.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Malta	44s. 6d. f.o.b.	44s. 6d. f.o.b.
Welsh, Las Palmas	40s. 6d. f.a.s.	40s. 6d. f.a.s.
Welsh, Naples	38s. f.o.b.	38s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	55s. f.o.b.	55s. f.o.b.
Port Said	49s. f.o.b.	49s. f.o.b.
Alexandria	43s.	43s.
Capetown	35s. 3d.	35s. 3d.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

	June 17	June 24†
Cardiff:		
Admiralty, Large	26s. 6d.@ 26s. 9d.	*25s. 9d.@ 26s.*
Steam, Smalls	18s.@ 18s. 6d.	*17s. 6d.@ 18s. 6d.*
Newcastle:		
Best Steams	23s. 6d.@ 24s.	**24s.**
Best Gas	21s. 6d.	21s. 6d.
Best Bunkers	20s.@ 21s.	*19s. 6d.@ 20s.*

†Advances over previous week shown in **heavy type**; declines in *italics*.

North Atlantic

Orders Await Freight Cut; Southern Coals Streaming In

Buying Is in Small Lots—Prices Below Hoover Maximum on Southern Fuel Are Check Against Pennsylvania Figures—Rush, with Higher Prices Seen for July.

BUYERS are generally adhering to their policy of waiting for the July 1 reduction of freight rates before placing orders. Purchases are confined to small lots. Receipts all-rail are light but Southern coals are moving in heavy volume at prices under the Hoover maximum, which serves as a check against higher Pennsylvania quotations.

A rush for coal in July, with higher prices, seems inevitable. Consumers who have been out of the market for so long must soon take steps to replenish their supplies. It is very likely that demand will raise mine prices to an extent that will absorb the savings of the July 1 freight cuts.

NEW YORK

The nearness of July 1 is one of the reasons for the present lack of demand. Buyers are hard to find, only those who must have coal being in the market. Instead of the usual five and ten car order shippers are glad to get a one-car or two-car order.

The scarcity of anthracite steam sizes was expected to create an additional demand for bituminous coal and it might be the cause of reducing the number of cars at the local piers, which have been large considering present conditions. At the end of the week there were about 1,200 cars at the piers.

Some surprise was caused among the trade by the announcement of the Interborough Rapid Transit officials that the cause of last week's tie-up of the East Side lines was bad coal. Considerable Southern coals have been coming into the market for some time past and it was believed that the company was receiving much of it.

A good demand for Southern coals continues and heavy tonnages are being brought here, but, as heretofore, the majority of it comes on old orders. Free lots of these coals were quoted $7.75@$8, alongside.

CENTRAL PENNSYLVANIA

Production has been steadily picking up. Up to and including June 18, the output was 8,554 cars, as compared with 6,632 cars in the corresponding period of May.

Interest in the strike centers around the South Fork Branch sector, where several of the largest operations in the district are located. It was non-union before April 1, but was organized and closed down. However, operations soon started and the output for the first nineteen days of June was 693 cars as against 319 cars for the corresponding period in May.

PHILADELPHIA

The market is quiet, especially as the buyer is still in the attitude of trying to wait out the end of the strike, or at least until the Government arranges for a price for the Pennsylvania product. However, this latter event seems to be as remote as ever.

There is no question that stocks are fast going down. This would seem to be proved by the numerous inquiries that buyers are making. Objection is frequently heard as to price, but coal is being ordered in small lots.

A great deal of complaint is abroad as to the quality of the coal shipped, and probably a good deal of this is justified, as much of the production is from small, poorly equipped mines. Prices are inclined to be firm, and in some instances there have been signs of stiffening over last week's quotations.

Tide business is quiet, although there is a little better bunker trade. During the latter part of the week there was a feeling current that the strike was nearing an end. The serious disturbance in Illinois may tend to focus the attention of the entire country on the situation, and bring substantial outside influence to bear in such a way as to speed an understanding between the men and operators.

BALTIMORE

Following a brief let-up in buying, which was attributed to the desire of consumers to take advantage of the coming freight rate reduction, there has been a renewed rush for fuel, this being especially true of larger consumers. The price situation at present is that practically all regions, with the exception of the Southern fields, are selling around $3.50@$4, while Hampton Roads prices are still at $3.25@$3.50 a net ton.

Coal men are of the impression that there will be a flood of buying in July, and that the demand will so far outstrip the supply possibilities that prices are sure to mount. Even in that event, there may be a mounting market as adjustments will naturally be slow.

By agreement of counsel, sixty striking coal miners of the Western Maryland field and the R. J. Ross Coal Mines, Inc., and the West Virginia Pulp & Paper Company, a postponement of the injunction proceedings instituted against the miners by the coal and paper companies was indefinitely postponed in the United States District Court of Baltimore. The Court, however, continued a temporary injunction restraining the miners from interfering with the employees of the two concerns named.

FAIRMONT

Further gains were scored in production in the week ended June 17, there being on an average of 160 in operation throughout the week. During the latter part of the week the demand was not quite so heavy and prices softened to some extent, $3.25 being about the maximum. Many buyers are said to be waiting until after July 1 to place orders.

UPPER POTOMAC

Gradual but steady gains are being made in activities of mines, especially on the West Virginia side of the Potomac, where mines are securing better protection from interference. Most of the mines have at least 50 per cent of their men at work where there is any activity at all. There is a fair demand only for the product of the Upper Potomac and Georges Creek fields with prices ranging $3.25@$3.50. Legal action has been resorted to by some companies in order to prevent interference with operations.

South

BIRMINGHAM

Mines have sold a large tonnage for shipment to Western points. Some 1,500 cars, about two-thirds of which was railroad fuel and the balance for industrial use, were booked for shipment to points in Chicago territory last week, and a number of orders were placed for coal to go to St. Louis, Kansas City, and other places. Practically all business was for Big Seam, Carbon Hill and similar grades of mine run, there being no disposition to buy better quality of steam or any grade of prepared fuel. This coal moved in the emergency rates recently established.

The domestic market is devoid of activity. Coal on contract is moving fairly well, but mines depending on the spot market are having trouble.

Mines competing for business in Western territory are practically throttled against any material advance in prices account of the freight differential enjoyed by west Kentucky and other fields. Until the shortage becomes more acute producers will have to be content with the present small margin of profit.

Quotations on steam coal have undergone little change in several weeks, and current prices are shown below, basis f.o.b. mines:

	Mine Run	Domestic
Carbon Hill	$2.00@$2.25	$2.15@$2.40
Cahaba	2.00@ 2.50	3.15@ 3.65
Black Creek	2.00@ 2.50	2.90@ 3.15
Corona	2.00@ 2.25	2.65@ 2.90
Pratt	1.75@ 2.00	....

Production is on the increase with resumption at a number of mines and others operating on a better schedule.

VIRGINIA

Mines only lack about 20,000 tons of producing at full time capacity, the output having been speeded up to 217,000 tons. The only serious losses are to be attributed to car and labor shortage. On the C. C. & O. mines are within 1,559 tons of capacity production. Buyers are securing all the spot tonnage available in this field at about $3.25.

Anthracite

Retail Stocks Dwindling, But Consumer Is Not Uneasy

Orders Booked in Volume That Means Delay in Filling When Mining Is Resumed—Some Yards Close Awaiting Coal—Steam Tonnage at Mines Mostly Obligated.

RETAILERS' domestic supplies are running down, but there is very little uneasiness being shown by the consumer. Retail order books are filling, however, and there may be some delay attendant upon filling these accumulated orders when mining is again resumed. Some retail yards are already closed until coal is again available.

Steam tonnage at the mines is nearly all obligated and river coals are about all that is obtainable. Occasionally inconsequential amounts of independent coal are offered at high prices.

Some late activity is noted in the Northwest, as dock stocks are getting low and the belief is growing that a shortage must be faced this winter.

BOSTON

Retailers' stocks are steadily diminishing. Distribution has now got to a point where only a small fraction of season orders are being accepted for prompt delivery. Egg is the size in shortest supply locally, but stove and chestnut are not far behind. A few dealers are insisting upon orders for pea wherever the use of that size is possible.

At wholesale there is almost nothing doing. The prepared sizes are now about all cleared up and pea and No. 1 Buckwheat are the only sizes available.

ANTHRACITE FIELDS

The men have completed their vote to give authority to the union leaders to call a strike if they see fit. There is practically no doubt that the vote will be in favor of a strike. There is considerable talk that even if the leaders turn the suspension into a strike they will not call out the maintenance men, for in many cases it would probably mean that the mines would be closed for good and the men normally employed would be without jobs at the final settlement.

PHILADELPHIA

Retail business done amounts to almost nothing, and no efforts are being made to encourage people to buy coal. The absence of coal trucks on the streets tells the true condition as well as anything. However, all offices are receiving many requests for information on the outlook for coal next season and frequently these inquiries are turned into actual deliveries.

There has been constant nibbling at the storage stocks of pea coal by the dealers, and this week the orders received by the companies for this size have greatly increased. In addition quite a few dealers have placed orders to begin July 1, the obvious intent being to get the advantage of the lowered freight. However, they are not likely to receive this benefit, as the coal having been placed in storage under the present freight rate will likely be billed at the same rate, otherwise there would be a distinct loss to the companies.

Except for an occasional car or so of buckwheat none of the companies is taking orders for steam coal, as all in stock has been obligated on orders already in.

BALTIMORE

Dealers report that they have little fuel on hand. More yards were closed during the past week, and at the present writing there are very few yards with any material supplies. That portion of the buying public which has been in the habit of storing coal early is becoming restive under their inability to get deliveries at this time. In some cases the explanation of coal men that they have no coal to deliver or can liver only one ton lots to emergency cases, is accepted with bad grace. Coal men, point out, however, that this is trivial to the situation which will develop as fall approaches and they are unable to make deliveries to even those who have no coal in cellars.

BUFFALO

The end of the supply seems near. One after another of the shipping agents and distributors reports that this or that size is gone. As it appears now even emergency coal will soon be gone. Still the consumer does not show any uneasiness.

Occasionally sales by independent operators are made as high as $12 at the mines. Some at $11 was reported this week, but the coal still held by these companies is so small that no particular figure is cut in the trade by them.

NEW YORK

The market is becoming quieter. About the only sizes available are pea and buckwheat and the latter will be unobtainable soon to the spot buyer. Independent pea coal was quoted last week from $5.65 up, f.o.b. mines.

Consumers are beginning to show a trifle more concern and some have placed orders for next winter's coal, knowing that they need not expect any portion of it delivered until the mines resume operations.

Retail dealers in most instances, have some of the domestic coals on hand but are careful to whom they deliver it. Special classes of customers such as bakeries, are being taken care of and other consumers who must have coal are given small lots.

Buckwheat consumers soon must either take to burning pea coal or bituminous, so short is the first named size becoming. Rice and barley are practically out of the market. River barley is coming here in very small offerings, most of it being sold nearer the point of loading.

Coke

UNIONTOWN

The coal market, while active, is more inclined to be spotty than at any time since Secretary Hoover fixed $3.50 as a fair price for coal. This week the railroads seem to be the big buyers and while steel interests are still in the market they are not so insistent about tonnage as has prevailed heretofore.

There is great scurrying for coke among pig-iron producers, but very little is obtainable. It may be significant that some 200 independent ovens were lighted last week. Whether that is in response to the strong demand or to an appreciation by operators that the strike is about over does not yet appear. At the outset of the strike, independent operators let it be known that they would not attempt to resume until the strike situation had been definitely decided.

CONNELLSVILLE

Demand for coke has increased somewhat, while offerings are still quite limited. While there have been continued gains in coke production, larger in the past two or three weeks than in May, the increase is chiefly on the part of steel works interests, so that merchant offerings remain very restricted. The Frick company blows in quite a number of additional ovens each week, though the major part of its increase in coal production is being shipped instead of being coked in the region.

Normally the Carnegie Steel Co. operates its blast furnaces almost wholly with Connellsville coke and byproduct coke made from Connellsville coal, so that it is very significant that the company is now operating 38 blast furnaces, against 34 on April 1.

A week ago inquiry for furnace coke was chiefly by miscellaneous users, rather than blast furnaces, but now some inquiry has arisen from blast furnaces, and $8 would be paid in that quarter for standard furnace coke. Foundry coke is stronger, with sales at up to $8.50.

The *Courier* reports coke production during the week ended June 17 at 51,800 tons by the furnace ovens and 15,050 tons by the merchant ovens, a total of 66,850 tons, an increase of 8,187 tons. On account of the holiday May 30, a long-range comparison best shows the rate of gain, with output of 52,200 tons in the week ended May 6, 59,130 tons in the week of May 27 and 66,850 tons in the week of June 17.

BUFFALO

Furnaces are running at a good rate and shipping liberal quantities of iron. The byproduct ovens supply them with about what coke they need. Some jobbers say they have given up trying to buy coke from the old beehive plants for the best ovens are mostly closed and the coke offered is of such doubtful quality that it is not worth while to handle it.

Chicago and Midwest

Prices Advance Following Heavy Buying in Kentucky

Purchases by Railroads and Industrials Cause Boost—Spirited Demand Expected as Result of Lower Freight Rates, Which May Cause Further Rise.

RAILROADS and large industrial consumers boosted the price of coal last week by buying rather heavily in western and eastern Kentucky. The price in western Kentucky was down to $3.65 and in eastern Kentucky to $3@$3.25 early in the week in a mild buyers' strike. West Virginia Pocahontas was plentiful at $3 on run of mine.

The railroads did most of the buying and when they got through western Kentucky was up around $4@$4.25. Purchasing was done by the railroad committee at attractive prices, ranging from the low of $3.65 @$3.85. When the quotations got beyond the high figure the roads halted buying somewhat, only to turn into eastern Kentucky where purchasing was done outside the committee in direct sales at $3.25@$3.35.

CHICAGO AND MIDWEST

Buying was induced in a recognition by the consumers that prices probably will be higher after the first of the month, when the lower freight rates become effective. A rather spirited demand is expected then, as consumers are known to have been holding off for some time for the lower rates. Advances are accepted as the natural order and hence the scramble of those who could afford to get in under the wire. Besides, there was a little concern by purchasers to stock as much as possible for any emergency in a strike of railroad workers.

Industrials bought only when prices were right. They took from 25 to 50 cars here and there when jobbers pushed sales in order to avoid demurrage charges.

Smaller consumers, however, were not buying. A large number of inquiries were received from the country for harvest coal but shipments were not asked for until after July 1. Retailers were beginning to make inquiries for eastern Kentucky coal and Pocahontas and some of the producers reported rather increased orders.

The Illinois Central is reported as bringing in a train load of Alabama coal a day for distribution along its lines. So far, however, Alabama coal has not been a factor on the Chicago market but it is expected to be brought here if the western Kentucky price goes beyond the $4.25@$4.50 figure.

Prices Saturday on the western Kentucky product were strong at $4.10@$4.25. The Hoover maximums were generally reached on the eastern Kentucky and West Virginia coals. There were some reports of jobbers selling eastern Kentucky prepared sizes at $4 but the instances were not numerous.

SOUTHERN ILLINOIS

The comparative quiet which has existed in southern Illinois has been broken by the tactics of union miners who ruined the property of the Southern Illinois Coal Co., which has recently attempted strip mining in the vicinity of Marion. As a result, over 25 men employed by the company were brutally butchered.

The striking miners in this territory became hostile towards the so-called strike-breakers when President Lewis of the United Mine Workers sent word that the men employed in the operation of the strip pits as members of the Steam Shovelers' Union were strike breakers.

There is no storage coal available in the field and the amount of tonnage produced from the strip pits during their short period of operation is negligible.

ST. LOUIS

Storage supplies of dealers and industries are becoming rapidly exhausted and evidence of increased outside buying is becoming stronger each day. Domestic demand is quiet and upon the advice of dealers consumers are awaiting a settlement of the strike rather than buy high-priced west Kentucky coal.

Country demand has increased materially within the past few days, due to the urgent need of threshing coal. There is no further tonnage of Illinois storage coal available, this supply having been exhausted within the past week. The threshing demand will therefore have to be supplied with Kentucky coal. Operators in that field are today quoting prices around $4@$4.10 on lump, egg and mine run, and $3.85 @$4 on slack, selling their output only from day to day.

A part, at least, of these requirements will be met with Missouri coal, as the Cannel operations at Versailles, have been reopened and coal can be supplied to certain points in central and western Missouri at considerably lower prices than west Kentucky coal.

WESTERN KENTUCKY

The market is back to about the peak that had been reached this spring. Movement continues heavy, as demand has taken care of all reported demurrage or slow-selling coal of last week. There has been a large increase in the population of mine towns since the strike. Many former workers who have been in Indiana and Illinois have returned.

Facilities for handling tonnage are very fair as a whole, and the L. & E. gateways have not been blocked. Railroads are endeavoring to get shippers to route as much coal as possible through the less congested gateways.

As soon as the freight reduction becomes effective it is believed that there will be a heavy increase in demand from Chicago, Detroit and other large industrial centers. The present market is rather stiff at $4, there being very little coal at under that figure.

INDIANAPOLIS

An unusual increase in inquiries is the outstanding feature of the market. These are coming especially from industrial plants that did not store a sufficient amount to keep them going for such a prolonged period. The principal coal coming to this market is from western Kentucky, quoted $3.75 @$4.25. A number of Indiana operators who have sold all their no-bills are now attempting to supply customers by going into the jobbing business.

The public is beginning to take notice of the strike. It is the general opinion of the trade here that regardless of agreements concerning prices at the mines, unless the strike is settled quickly the market will be mighty panicky.

LOUISVILLE

Those who held back their buying in order to take advantage of reduced freights may not profit materially by that action. So many did the same thing that prices softened a little in mid-June, but by July 1 it is believed prices will be at the peak of the Hoover agreement.

Prices are firmer this week, due to demurrage stocks being cleaned up. Lake movement is steady and good and railroads are buying more freely. Steel mill business continues good, and there is a steady movement north and east.

There is some car shortage as a result of congestion at terminals, in getting the heavy movement of loads and empties through, which is resulting in some trouble in getting cars to load at the mines. Much of the trouble is over. failure of connecting lines to have necessary motive equipment for handling tonnage turned over.

The trade as a whole is becoming more sold on the Hoover program, realizing that if the coal trade does not control itself, it may result in Federal regulation.

Canada

TORONTO

The effects of the strike are now beginning to be seriously felt. While the demand for anthracite is increasing, supplies on hand are rapidly becoming exhausted. Some dealers are refusing to accept orders. The situation as regards bituminous coal is practically unchanged, the small shipments coming forward from West Virginia and other non-union mines being sufficient to maintain the supply in view of the light demand.

Quotations are as follows:

Retail	
Anthracite egg, stove and nut	$15 50
Pea	14 00
Bituminous steam	9.25@ 9.75
Domestic lump	11 25
Cannel	16 00
Wholesale, f.o.b. cars destination:	
¾ in lump	9.25@10.00
Slack	8.00@ 8.75

Northwest

Eager Coal Seekers Limited To Orders Docks Will Accept

Continuation of Strike Causes Uneasiness Over Winter Fuel Needs—Stabilization Efforts of Certain Interests Averts Increase in Price.

BUYING is now practically limited to what business the docks will accept. At the outset of the present active period purchasing was confined mainly to railroads and other large users. Then the general run of industrials came into the market, only to find that supplies had been largely snapped up on contract and what free coal remained was being doled out piecemeal or held for old connections.

There is therefore a growing feeling of nervousness over next winter's requirements. It is now realized that a continuation of the strike for even a short time will endanger the supply and tonnage is being eagerly sought. Due to the stabilization tactics of certain docks, however, there has been no increase in price.

MINNEAPOLIS

It will be a relief when the first of July has come, for there will be the new freight rates available and one less cause for inaction in the market. There is some apprehension being felt in the coal trade over the situation. Ninety days suspension seems to be a great plenty of non-production if the Northwest is to have a reasonable supply for next winter. People in the trade realize that it takes time to get the docks restocked and the longer the suspension endures, the greater will be the demand from all sections, which must be filled before there will be a surplus for the Northwest.

The stocks on the docks are down to the vanishing point, broadly speaking. Buying has been limited except in so far as some have been willing to anticipate their wants. But as the practice is to price coal at the ruling figure at time of delivery, there is not a great deal of inducement for ordering where delivery cannot be promised. The inducement may appear later, when orders are filled in line of filing, but no one seems to have much alarm about this phase as yet.

However, the situation is one of awaiting the outcome of circumstances. Until there is some sort of a resumption, the Northwest cannot do much. Orders may be accumulated against the arrival of the coal, but they will not help get the coal. Rumors that the government will soon take hold, if there is not an adjustment of the controversy, serve to keep people from growing excited, but do not guarantee any real help.

DULUTH

Apprehensions that stocks on docks may be gobbled up before they have had an opportunity to contract for their supplies is leading to buying on a heavier scale. At the outset buying of coal was confined mainly to the railroads, the mining companies and blast and open-hearth furnace plants at Duluth. Buying from those quarters resulted in two-thirds of the dock companies' stocks being contracted for before the smaller industrial concerns dropped on to what was going on, and the consequence is that all hands are now endeavoring to make up for lost time.

Dock operators have received instructions from their headquarters to make no further large contracts and to confine themselves to taking care of their regular customers. They have little free coal and buying by retailers who have deferred placing their orders until July 1 when lower railroad freight rates will become effective, is yet to be taken care of.

In spite of the flurry the market is ruling steady at the basis set some time ago; $7 for lump, $6.50 for run of pile and $6 for screenings. This is attributed to the stand taken by three of the largest operators who opposed any efforts to bring about a runaway market and the consequent crystallizing of public sentiment against the trade.

Inroads are being made upon the anthracite stocks. Consumers are scenting the possibility that the usual tonnage may not be moved before the close of the Lake season and they are setting in to protect themselves. Retailers have been keeping their teams busy of late in filling those orders.

MILWAUKEE

The market continues dull, but there is a growing feeling of nervousness over the uncertainty of the future supply, and a rush of orders is bound to develop in the near future. This is evidenced by anxious inquiries from interior districts. The general opinion is that the Northwest will suffer a serious coal famine unless the strike is stopped within a short time.

Anthracite is about cleaned up, and only one cargo has been received so far this year. Soft coal is in fair supply, however. Dealers have a thirty-day stock and cargoes are reaching the docks almost daily. There has been no change in prices since the soft coal advance of two weeks ago.

Revised figures of the Lake coal receipts thus far this season eliminate the 7,300 ton cargo of hard coal which has figured in the April record, and places it in the soft coal column. This confines the anthracite receipts to 700 tons of screenings which were received from Escanaba and 485,593 tons of soft coal, against 345,006 tons of the former, and 969,556 tons of the latter in 1921.

New England

Midsummer Dullness Settles Upon Market

Inquiries Insignificant and Scattered—Industrial Outlook Lacks Promise—Movement from Hampton Roads Wanes—Hope for Lower Prices Than Freight Cut Would Warrant.

FOR dullness the present week matches any midsummer period in coal history. Inquiry is limited to single car lots and there is only scattering demand for these. In no direction is there any tuning up industrially and should the suspension be brought suddenly to an end, shippers could expect very little help from this territory in moving coal. Inland from Boston and Providence there is only a light tonnage moving on contract.

On every hand consumers have declined coal for June shipment. Not only are they desirous of profiting by the 10 per cent freight reduction but there is an impression also that prices will recede much more than the lower tolls would of themselves make possible.

Certain of the charitable institutions rejected bids that were submitted covering deliveries of Pocahontas and New River during July and August on the ground that proposals were too high. Some of the bids were as low as $7.09, on cars Providence, and $7.35, on cars Boston, for Navy Standard coals.

Under these conditions it is hard to figure any improvement in demand during the next six months. Oil has now supplanted coal to an extent that will make the market for the latter rather less responsive than it was in years when oil was not such a factor. There are more agencies merchandising Hampton Roads coals and the outlet is so much more restricted that only a resolute attitude on the part of operators and a broad sustaining market in other directions will probably enable them to carry through anything like the Hoover price.

Meanwhile, prices on the best grades at Hampton Roads are $6.00 and less, with a few shippers actively soliciting offers for spot coal. At this end, $7.25 has been quoted and it will be interesting to see next week whether that level can be maintained.

For Pennsylvania grades there is only a very narrow market. For the most part, it is confined to areas 100 miles or so from Tidewater, and current receipts show how light is the demand.

Coastwise freights continue easy. There is a surplus of transportation. About 85c. has been mentioned as a rate from Norfolk to Boston, but this will apply only on large bottoms.

Eastern Inland

Prices Resume Higher Level As Demand Takes Upturn

Reaction Follows Lull Attendant on Settlement Rumors—Large Buyers Enter Market in Anticipation of July Rush—Lake Shortage Feared.

QUOTATIONS have resumed the higher level they held earlier in the month. Demand has taken a definite upturn, following the lull which came with the recent rumors of attempted settlement of the strike. The heavier receipts are easily taken, as many large buyers are again in the market, apparently in the belief that the July 1 rush of business will boost prices sufficiently to absorb the 10 per cent freight cut effective at that time.

Lake business is increasing. So far only 16 per cent of the 1921 Lake movement has been shipped, while at this time last year 48 per cent of the total tonnage had gone forward; therefore some anxiety is being shown over the possibility of a shortage this winter.

COLUMBUS

A better demand is developing. While orders are only for immediate needs, more consumers are in the market and a considerable tonnage is moving. The demand is becoming more widespread and indications point to a heavy increase after July 1.

Reserve stocks are being depleted and this is having its effect. Prices have now about reached the Hoover levels, although some shading from those figures is reported.

Retailers are cleaning up preparatory to taking in tonnage later. Retail prices are steady at former levels, with Pocahontas lump $7.50@$8. West Virginia grades are quoted $7.25@$7.75. Some eastern Kentucky coal is coming in and sells at about the same levels as Logan.

Lake trade is moving along quietly. The H. V. Docks at Toledo during the week ended June 21 loaded 152,000 tons, making a total of 1,017,000 tons handled since the start of the season.

CLEVELAND

The coal market has stiffened abruptly, following the recent lull in buying. Prices are higher and the demand is distinctly stronger. Consumers were encouraged to stay out of the market by reports that strike settlement was near. It was generally expected that the negotiations started some time ago in Cleveland by operators would result in finding a basis for meetings with the miners. Hope has not been given up by operators who are urging a settlement and resumption of mine production.

In the meantime consumers are waking up to a realization that stocks are getting near the danger point. Orders now being placed call for shipment on July 1 or after. Most of the smaller industries in Cleveland depend upon the Cleveland Electric Illuminating Co. for power. This company still has some coal on hand but the margin is beginning to get too low for comfort.

The chief source of concern is the Lake situation. The season's movement to July 1 is estimated at 3,750,000 tons. Of this amount only 2,500,000 tons have gone to the Northwest. Compared with this movement to upper docks, the amount shipped last year in the same period was 9,460,000 tons. In other words by July 1, 1921, 43 per cent of the movement had been completed against only 11 per cent this year. The prospect for congestion, if not actual inability to meet the demand, is in sight unless the strike ends soon.

DETROIT

Buyers are not yet indicating any active interest in the market, although some business is being done by steel companies and there is a small volume of buying by railroads. Many large steam consumers are still carrying reserves that place them in a comfortable position for several weeks to come. Retailers are buying no coal at present. They too, are waiting for the reduction of freight rates to become effective.

The general delay is arousing apprehension of a troublesome shortage during the later months of the year, due to the failure of buyers to keep coal moving now. Though the retail yards have considerable quantities of coal, their supply would not last long with an active demand. This is particularly true of anthracite.

Smokeless lump and egg is quoted about $3.50, mine run holds around $3.25 and nut, pea and slack is $3.10@$3.15.

PITTSBURGH

No effort has been made thus far to start any of the union mines, although for a fortnight there have been rumors at large that some movement might be expected any day. The respective positions of the operators and miners are unchanged, the operators regarding the four-state agreement as a dead issue, while the mine officials show no signs of being willing to consider anything else.

Public sentiment is aroused over the murders in Illinois and many men not associated with either operators or miners are disposed to consider the president of the U. M. W. responsible. Strip mining in this district is proceeding, with a considerably greater tonnage than before the strike. The coal is being sold regularly at $3.75 for slack and $4 for lump.

Production in Connellsville is increasing at a more rapid rate than formerly. The increase is largely by the Frick company, but there is also more coal reaching the open market. Prices are defined more closely, buyers being discriminating, and a difference of 5c. or 10c. in the price quoted may determine whether the inquirer takes the coal or not. The market is a shade easier and is quotable at $3.40@$3.65 for steam mine run. Westmoreland gas is occasionally encountered, the market being about $4@$4.25 for mine run.

NORTHERN PANHANDLE

Conditions continue to be more favorable for successful operation and marketing of coal. There is less interference with operation and although demand is by no means at the peak, yet it is brisk enough to absorb the output, especially in view of the heavy buying by railroads and utilities. The demand, however, is confined to fuel for industrial purposes.

BUFFALO

Changes in the trade are small, but the feeling is less reassuring. Everybody confesses to uneasiness and it is pretty generally agreed that the next ten days will see an end of the apparent apathy on the part of producer, miner and consumer. Somebody must weaken before long.

There is naturally any amount of eagerness for something, in fact almost anything, to set the wheels turning again. Demand does not increase. Most shippers report that production exceeds it, yet prices are strong. Predictions are common that they will advance soon, in spite of the July reduction of freight rates.

The Lake fleet is active, for ore is moving faster than it was and grain has kept up until now. The only coal moving is that which comes from West Virginia via Ohio ports. The amount received for last week was 55,900 net tons.

EASTERN OHIO

While larger quantities of coal are reaching industrial centers by reason of needs growing out of the general improvement in business, operators and jobbers state that there is no particular increase in inquiries or demand. However, prices have experienced slight advances in some grades.

There has been plenty of non-union coal available to meet all requirements which have arisen up to the present time, but it is freely predicted that the time is fast approaching when stocks will be depleted and a more widespread need for coal will develop which cannot be supplied at the present rate of production.

Apprehension is becoming apparent with respect to the probability that Lake transportation will be unable to take care of Northwestern requirements during the remainder of the season of navigation, should operations at union mines not be resumed by the middle of July. Stocks of coal at the docks have been pretty well cleaned out and the minimum requirements served by this trade will approximate 24,000,000 tons during the next twelve months. The anticipated deficit in Lake shipments will have to be made up by all-rail tonnage and this will further aggravate the matter of car supply later on.

Bituminous coal receipts at Cleveland during the week ended June 17 were the largest of any week since April 1. Total receipts amounted to 1,247 cars. Industries received 1,085 cars, this quantity being an increase of 172 cars over the previous week; while retail yards received 162 cars, or an increase of 81 cars.

Cincinnati Gateway

Increased Buying Steadies Market Near Hoover Limit

Lake Interests, Railroads, Western Buyers and Steel Mills Are Active Agents—Contrary to Expectations, Consumers Do Not Wait for Lower Freights.

HEAVY buying on the part of the Lake people, increased takings by the railway companies and an increasing demand from the West has so stabilized this market that prices are now hovering around the maximum that was set by Secretary Hoover. The wiseacres of the trade had figured that the lower freight rates due July 1 would hold off any great rush of buying but it is quite evident that there are many who believe that a bird in the hand is worth a flock under the new tariffs.

While the steel mills have not been prominent in the market they have been taking a heavy tonnage, all of which has kept prices on the upgrade rather than showing any signs of sagging.

HIGH-VOLATILE FIELDS

Kanawha

There has been a gradual gain in production as more men report for work. Bushwhacking has featured the attempt of Kanawha operators to run their mines and two or three have been killed so far. Although there has been a general disposition to await the coming of July 1 before buying on a large scale, as yet there is a fairly active demand. Mine run is ranging \$3@\$3.25 with slack at about the same figure. Lump and egg are bringing \$3.40@\$3.60.

Logan and Thacker

Under existing market conditions Logan mines are unable to meet the demand made upon them for spot coal. Lake shipments are growing in volume. There is not a particularly large volume being shipped to Tidewater or to Eastern Inland markets. The only factor in retarding production is the inability to secure more man power. General labor conditions are entirely satisfactory.

Production is still being maintained by Thacker mines at about 160,000 tons a week. Plants are securing all the equipment needed to handle the large output but some loss is being felt because of a shortage of labor. Inquiries are outstripping orders particularly from Western market sources. Lake shipments are large. There is comparatively little free coal available.

Northeastern Kentucky

Pending a reduction of freight rates after July 1, there has been a slight recession in demand. Prices remain at \$3@\$3.25 on mine run. The lighter demand has had the effect of pulling down production to some extent, as reflected in slightly increased "no market" losses. Railroads are not buying on quite so heavy a scale.

CINCINNATI

Heavier production from New River has allowed a greater tonnage of this coal to come Inland or work north to the Lakes. This has helped to keep the price within the same range of the high volatile with the exception of lump and egg which is held firm at the maximum, only smaller mines selling any great amount at concessions and this where the residue is needed to fill byproduct slack contracts. Any number of retailers whose stocks are low are rushing in inquiries for July shipments but the local offices hold strictly to sales on a spot basis.

Mishaps in southeastern Kentucky have held down production—injury to a Hazard power plant put several of the mines out of commission for three days. The L. & N. embargoed the shipment of perishables for three days to move coal and even this did not pick up all of the Bell County and Harlan standing. Kanawha hopes to come in with a larger tonnage through an injunction issued in the Charleston courts which will give a greater volume for sale here.

The retail situation is unchanged so far as price is concerned but for the first time since the rigid weeks of the war there is a pinch of river coal being felt here. All-rail operators, who opposed the cuts in price in April and who have contracts, however, are insisting upon holding to the old time prices.

SOUTHEASTERN KENTUCKY

After 10 days of quiet, the market started off with better demand and higher prices the first of the week. A large percentage of the new business is being shipped to railroads in the North and Northwest and tonnage demanded by the Lakes is also increasing.

Domestic coal is not so active. Dealers seem to follow the course pursued by their customers; that is, to wait for freight reductions, although better posted dealers expect price advances will be more than the savings in freight and are stocking up. Car supply is not satisfactory. Three, and in some cases, four days were lost last week account "no cars" and the outlook is not good.

LOW-VOLATILE FIELDS

New River and the Gulf

New River improvement is most marked. The opinion among operators is that the strike is broken in this particular region. There are about 65 mines in operation, all of such mines having been originally affected by the strike. Production is now ranging well over 120,000 tons a week and is being increased from week to week. Market conditions are conducive to an increase in production more especially since it is possible to find an outlet at Tidewater.

In the Gulf region, there is complete freedom from any strike trouble. Many mines are working to capacity to take care of contract and spot business, particularly in the East and at Tide.

Pocahontas and Tug River

Limited man power in view of the heavy demand for Pocahontas coal is the only thing which prevents a larger production. This region is producing more coal than it ever did and is finding a ready market. Operators question whether the railroads could transport any more coal from this and adjoining regions and look for an acute shortage of cars after July 1, for the transportation companies will then be called upon to handle both June and July business. Prices are being kept within bounds.

Production losses are comparatively light in the Tug River district and mines are producing virtually at capacity. A large proportion of the product of this region is under contract. Prices are being held within reasonable limits and although mine run on a spot basis is being sold at \$3.25, the contract price is much below that figure.

West

SALT LAKE CITY

Retailers describe things as very quiet. It is even quieter than a year ago. It was thought that the emergency which made it necessary to rush the national guard to the strike zone would have aroused the public to the necessity of purchasing their winter supply of coal, but it made no difference.

Operators are looking forward to a brisk business to start at an early date as the result of the change in freight rates to the Coast. There is still a big demand for slack, locally, which is becoming scarce. The difficulty of moving the lump grades has resulted in some of the largest producers running more mine run.

KANSAS CITY

One of the operators has leased a mine to the miners who are operating it on a co-operative basis and turning the coal back to the owners of the mine who are selling the product and dividing the profits with the miners.

Another large operator opened this week and enough miners applied for work to justify operating. Some of the Kansas miners have been out for nearly a year, and as strike funds are exhausted and benefits from outside sources have been shut off they are very anxious to work.

The fly in the ointment, however, is the threatened railroad strike. The old-time railroad men may not strike. They have not forgotten the strike of 1894, nor how some of the best skilled men in the country, who had good runs and positions, have been driving drays ever since, instead of driving engines. If there is a strike of any magnitude, it will be the young hotheads and men of no great responsibility that will bring it about.

by Google

News Items From Field and Trade

ILLINOIS

A party of coal men of the Illinois Coal & Coke Corporation, of Chicago, were in Mt. Vernon recently, where the concern is completing arrangements for the immediate sinking of a 10,000-ton mine. Included in the party was: **E. J. Couper, Albert J. Nason, J. D. Zook** and **H. N. Leighton**, all of Chicago, and **Joe Hebenstreit**, of Nokomis.

The capital stock of the **Groveland Coal Mining Co.** has been increased from $1,000,000 to $1,200,000. The members of the board of directors has also been increased from five to nine.

Orton & Steinbrenner Co., manufacturer of locomotive cranes, grab buckets and coal crushers, has moved its offices from the eleventh to the nineteenth floor of the Transportation Bldg., Chicago.

The Big Muddy Coal Co., of Tamaroa, is to spend approximately $20,000 on repairs and various improvements at its property near that city. The company purchased the mine some months ago and acquired with the property about 1,700 acres of coal land.

T. S. Cousins, general superintendent of three mines owned and operated by the Equitable Coal & Coke Co., of Chicago, has returned to southern Illinois, after a few days' business visit in the main offices of the company in Chicago.

A sum totaling over $500,000 has been issued out in checks as strike benefit to the union miners of Illinois, according to a statement from the office of United Mine Workers, Secretary-Treasurer Nesbit of Belleville. This is the first to be paid to the miners since they came out on strike April 1 and amounts to about $5 per man.

Harry A. Lawrence, well known in the southern part of the state, having served for some time with the Union Colliery Co., of St. Louis, is now connected with W. H. Harris, Inc., of Chicago. He was recently with the Newsam Coal Co., of Chicago.

C. L. Dering, wholesaler of Chicago, has gone to the Montana Rockies with Mrs. Dering for the summer. They will return to Chicago Sept. 1. Mr. Dering recently returned from a visit on the west coast of Mexico.

The Pennsylvania Pump & Compressor Co. has recently opened a district office at 105 West Monroe St., Chicago, with H. M. Montgomery in charge.

The Pittsburgh Testing Laboratory announces the appointment of Harry M. Wey as manager of the Chicago district, with office at 1560 Monadnock Block.

INDIANA

The Evansville, Indianapolis & Terre Haute R.R. has begun to rebuild its line between Terre Haute and Petersburg, which has been described as one of the most important rehabilitations planned in central western railroad circles this summer. For several months the New York Central, owner of the line, has been engaged in improving the track and switching facilities to take care of the mining operations planned there, including investments by a number of Terre Haute men.

Edward Shirkle, of Terre Haute, has been appointed receiver for the **McClelland Coal Co.** on a petition of the **Bickett Coal & Coke Co.**, which also asked judgment for $50,000 for money loaned and advanced to the company. The petition also set out that the McClelland company had other indebtedness of about $45,000. The complaint states that the $45,000 had been advanced and loaned to the company and that a mine in Riley township, owned by the company, was idle, making necessary an additional expenditure each month of $1,000 to keep the mine in condition and to pay a small force of employees for this work.

Drilling for coal has been started on **Brazil Block Coal Co.'s** former holdings of 610 acres near Clay City. This land was sold by the United States Trust Co., of Terre Haute, as trustees, to Lewis Schauwecker, a merchant of Clay City.

Henry M. Abel, of Indianapolis, has been appointed receiver of the **King Solomon Coal Mining Co.** This awakens rudely a large number of Negroes in Indianapolis, Louisville, Cincinnati, Chicago and other cities from a dream of wealth and sudden riches. The mine was prospected as a get-rich-quick scheme for Negroes. It was an appealing scheme but great was the fall thereof. However, the mine was not a prearranged swindle, as a number of the most influential Negroes in the cities mentioned were interested from right motives. But the coal land purchased at $40 an acre in Martin County was found to be worth no more than $2.50 an acre, and land purchased at Harrisburg, Ill., designed to retrieve this loss, proved to be an even worse failure.

Work is progressing on the new shaft near Newport. The air shaft was sunk two years ago and coal for local trade was hoisted through it. Capital has been raised to push the enterprise. Houses will be built and a switch will connect with the Chicago & Eastern Illinois. The second vein of coal is six feet six inches thick. The shaft goes through a 30-in. vein which will not be worked for the present.

The Riverview Coal Co. has been organized in Indianapolis for the purpose of dealing in coal and oil. The company has a capital stock of $125,000 and the organizers are John F. O'Brien, Margaret Kieley and John H. Beasley.

For the purpose of dealing in coal and coke, the **Tope Coal Co.** has been incorporated in Indianapolis with a capital stock of $50,000. The organizers of the company are H. C. Tope, John D. Gould and L. A. Whitcomb.

Work is to begin on a new shaft of the **Princeton Coal Co.** within a few weeks, L. C. Embree, attorney for the company, said recently. The new shaft will be sunk southwest of Princeton, on a strip of land dis-annexed by the city council. Disannexation was opposed by many citizens living in the west part of that city. A contract being drawn by the city will provide that the coal company shall not mine under a district extending two blocks on either side of the public square. The company had a mine near the city, but it has not been worked for several months.

The Hall-Zimmerman Coal Co., of Terre Haute, has filed a preliminary certificate of dissolution with the secretary of state.

IOWA

George L. Hart has leased 40 acres of the Harry Finarty place, at the northeast city limits of Knoxville, adjoining Knoxville Clay Products Co., and has set drills in operation. The location is about one mile east and north of G. H. Ramsey's defunct "Model Mine."

KANSAS

The Sheridan Coal Co., of Pittsburg, is said to be making preparations to open its other shafts in addition to mines No. 13 and 14, which are being operated co-operatively by groups of miners to whom they are leased. The same system will be used for the other mines.

KENTUCKY

M. M. Lilly, district superintendent for Boone County Coal Corporation at Sharples, W. Va., has resigned to accept position as general superintendent of the Bermuda Coal Co. and is now proceeding to erect a plant on the 1,000-acre tract of Hazard coal land acquired for that purpose.

Frank R. Lyons, vice-president of the Consolidated Coal Co., with headquarters at Fairmont, was visiting the Kentucky mines of the company recently.

Several mines operated by the **Jewett-Bigelow-Brooks Co.** have become members of the newly organized Kentucky-Tennessee Coal Operators' Association. The subsidiary mining companies which it has entered in the association are the Roth Coal Co., Jaybee Jellico Coal Co., J. B. Straight Creek Mining Co., and the Page Jellico Coal Co.

The new **Black Star Coal Co.**, of Louisville, operating in the Harlan field at Alva, is now shipping in a small way from its new developments. The company is controlled by the Sackett-Speed interests, Louisville.

The Osceola Coal Corporation, Pineville, has been formed; capital, $75,000; incorporators, B. F. Johnston, Coe E. Shaffer and H. J. Gibson, all of Pineville.

MARYLAND

S. E. Button, chief of the Pennsylvania Department of Mines, has been requested by the State Employment Commission of Maryland to serve as a member of the examining board, created by recent legislation, to pass upon the qualifications of applicants for the position of Chief Mine Engineer of Maryland. The law provides for a competitive examination covering very thoroughly the important phases of the mining industry. In addition to passing the examination applicants must be qualified by having had at least ten years' practical experience as a mining engineer in the bituminous coal industry. The law is a new departure in mining legislation.

MISSOURI

A verdict for $20,000 damages has been returned by a jury in Judge Allen C. Southern's division of the Jackson County Circuit Court at Kansas City against the **Hubbell Coal Co.** of Richmond, in favor of Louis Yoakum. He was injured March 1, 1921, while employed in the mine of the defendant company. He testified at the trial that he was sitting on the tracks, carrying the coal cars, eating his luncheon, when he received a current of electricity which threw him from the track onto a large power wire, causing him to be injured permanently. He sued for $50,000.

The board of directors of the coal mine at Switzler, near here, are making plans to extensively repair the shaft, which caved in recently, Dr. E. H. Smith, part owner, has announced.

Articles of incorporation have been filed at Carrollton by the **Carrollton Public Utility & Mining Co.**, recently, with a capital stock of $500,000. The instrument lists assets at $713,000. The purpose of the new corporation is to buy, sell and operate power plants, furnish water, control electric lines, distribute ice and lease and acquire coal mining property.

NEW YORK

J. G. Barry, sales manager of the General Electric Co. since 1917, and manager of its railway department for many years, and **A. H. Jackson**, of the Law Department, were recently elected vice-presidents of the company at a meeting of the board of directors.

Announcement has been made in New York by the Titan Iron & Steel Co., Inc., Newark, manufacturing mechanically puddled wrought iron, of the appointment of **W. Woodward Williams** as vice-president.

OHIO

The Cincinnati Board of Education let the contracts for supplies of coal to the **Queen City Coal Co.**, and the **White Oak Coal Co.**, for bituminous and to the **Ulland Coal Co.**, on smokeless at the low figures noted in this column recently.

The Cincinnati Coal Exchange held its annual picnic on June 15 at the country place of the Cincinnati Automobile Club at Loveland. There were 65 coal men present as well as fuel agents for various railways and visitors from all sections of the country, from Pittsburgh on the east, Cleveland on the north and Chattanooga on the south. A ball game was the big event which was won by the Sales Agents, though the Wholesalers claimed that the score sheet was torn up at the critical moment.

Charles E. Tribbey, president of the **Tribbey Coal Co.**, of Cincinnati, who was stricken with paralysis three years ago, has been in such failing health that he has again been forced to take to his bed. It is understood that there will be a reorganization of his company and that **John Glaser**, who has been in charge of sales for the past two years will be at the helm.

The Cincinnati office of the **Interstate Coal & Dock Co.** was closed on June 15. It is understood that other branch offices of the company also will be closed and that the business will be conducted from the main office in Huntington, W. Va.

PENNSYLVANIA

Howard W. Showalter, president of the Diamond Coal Co., of Fairmont, spent the early days of June in the Pittsburgh market.

A recent visitor in the Pittsburgh market was **P. H. Keener** of the Metropolitan Coal Co., of Morgantown.

The Emmons Coal Mining Co. of Philadelphia, has bought the Greenwich No. 2 and Greenwich No. 3 mines of the **Inland Coal Co.**, at Saxman, Cambria County, and will operate them under the name of the **Marion Center Coal Mining Co.** A. R. Llewellyn mining engineer for the Emmons company, has been appointed superintendent of the operations.

The Central Cambria Coal Co., has filed notice with the State Department that it has increased its capital stock from $5,000 to $261,700. W. C. Shiffer, Cambria County, is treasurer.

After being idle for a period of nine weeks, four mines of the **Reitz Coal Co.**, operating in the vicinity of Cairnbrook, Somerset County, have resumed operations with a diminished force. The men returning to work deserted the union.

Seven more ejectment actions have been filed with the Cambria County courts by the **Monroe Coal Mining Co.**, operating at Revloc. The families refused to vacate and the men would not return to their work in the mines.

The Berwind-White Coal Mining Co. has started eviction proceedings against five families at the No. 37 mine and ten at No. 40 mine, with more to follow. The report of the evictions was made to union headquarters at Cresson.

A charter has been issued at Harrisburg for the **Cleane Coal Mining Co.**, of Ramey, Clearfield County, for the buying, selling and mining of bituminous coal. Charles A. Jones, Ramey, is treasurer and the capital stock of the company is $50,000. The incorporators are George W. Minds and Charles A. Jones, Ramey, and R. D. Lorenz, Roaring Spring.

The Loma Coal Co., Ellwood City, has been incorporated with a capital stock of $25,000. O. J. Zimmerman, Coraopolis, is treasurer, and one of the incorporators, the others being D. J. Allison, Ellwood City, and Mary Allison, Ellwood City.

The Lock Haven Fire Brick Co., Lock Haven, recently developed coal lands at Tangas, Clinton County, nine miles from Lock Haven. Production is now under way and is being increased.

The Laurel Hill Coal Co., of Lackawanna County, C. H. Stevens, treasurer, has increased its capital stock from $10,000 to $40,000, according to notice filed with the Secretary of the Commonwealth.

The Richmondale Coal Co., of Lackawanna County, H. F. Warner, treasurer, has increased its indebtedness from nothing to $500,000.

The Light Railway Equipment Co., with general offices in the Commercial Trust Bldg., Philadelphia, has reorganized and rebuilt with new machinery, since the recent fire at the works near that city, and is now operating to nearly full capacity.

Approximately two miles of the county road between Simpson and Vandling, which was virtually destroyed by surface subsidences in the mines of the **Hudson Coal Co.**, will be rebuilt at the expense of the company as a result of a conference held recently between officials of the company and the county commissioners.

F. A. Fish, head of the F. A. Fish Coal Co., Toronto, has returned to the Pittsburgh office after spending some weeks at the head office in Toronto.

TENNESSEE

Application for a charter of incorporation has been filed at Chattanooga by the **West Virginia Coal Co.** The incorporators are F. O. Busbee, W. H. Workman, Julius Kirsten, Thomas M. Lockhart and P. L. Eller. The company is incorporated for $15,000.

The Trio Coal Co., of which A. M. Tomlinson is president, has filed a voluntary petition in bankruptcy at Chattanooga, with liabilities of $16,067.70 and assets of $8.61. Claims to the amount of $11,836.75 are secured, being notes. The balance is in unsecured claims.

The Chattanooga Iron & Coal Corporation has issued a call for coal diggers and has indicated that steady work will be offered for twelve months or more. The Dunlap plant has been shut down for a year and a half.

Work has started at the **College Mines** below Pikeville in the development of the property there preparatory to the operating of the mines. This property was purchased some months ago by a company known as the **Pocahontas & Sewanee Coal & Iron Co.**, with C. W. Walker, a well-known financier, as president. Plans are under way to drive a tunnel directly under the present entry so as to strike the coal vein on a level and to do away with the present incline.

UTAH

The Clark Co-operative Coal Co. has been organized at Thompsons to work the mines in Thompsons Canyon owned by U. H. Clark. California capital will back the project. The charter of the company provides that all stockholders may purchase coal at actual cost.

The American Fuel Co. is preparing to resume the production of coal on an extensive scale at its mines at Sego, Grand County. It is expected a trainload of coal will be shipped out every other day.

VIRGINIA

Announcement has been made by the Pocahontas Fuel Co., of the appointment of **George W. Craft**, general manager of the Mead-Tolliver Coal Co., as general superintendent of the operations of the company, with headquarters at Pocahontas, Va. The position to which Mr. Craft has been appointed was held for many years by J. C. Turley, of Bluefield, whose death occurred not long ago. The appointment of Mr. Craft becomes effective on July 1. Twenty-five superintendents will report to him. Mr. Craft's successor at Killarney has not so far been appointed.

H. M. Fadley, of Beckley, W. Va., and formerly of Charleston, has opened the Norfolk offices of the **C. H. Mead Coal Co.** This company is connected with the Consolidated Coal Co., Bailey-Wood Coal Co., Ragland Coal Co. and Ingram Branch Coal Co., all of which will function through this office.

E. W. Wallace, formerly Tidewater agent for the Matlack Coal Co., and now associated with the Bowater Coal Co., is in Norfolk. He recently returned from a trip to Europe for his concern, and is preparing for a business trip to the Argentine.

E. W. Robinson, formerly Norfolk manager here for the Kentenia Coal Co., has formed a connection with the Eastern Coal & Export Co.

WASHINGTON

Bellingham mines, closed since April 1 on account of the miners' strike, have reopened on the open-shop basis, according to John C. Eden. The 1919 scale, $5.89 per day, will be paid.

WEST VIRGINIA

T. H. Wickham, of Beckley, who is interested in a number of mining companies operating in the Winding Gulf field and who is treasurer of several of the concerns, has reached home after a protracted sojourn in Europe. Mr. Wickham visited Constantinople among other places and while disembarking there was the victim of an accident which has crippled him for the time being.

The Taylor Fuel Co., which was recently organized by M. L. Taylor and others formerly connected with the Morgantown Fuel Co., has moved into its new offices in the Monongahela Bank Bldg. at Morgantown.

In the first report made by the receivers of the **American Gas Coal Co.**, Morgantown, to the Circuit Court of Monongalia County, it is stated that the mine has not been operated owing to market conditions and unsettled labor conditions over which the receivers have had no control. The report filed with the court covering the period from Oct. 14, 1921, until April 10, 1922, shows that receivers' certificates have been issued to the amount of $13,095.81 and that money on account had been received to the amount of $1,170.66 together with $88.76 on deposit in bank at the time the receivership was granted. Accounts receivable are set forth as $7,906.28, but according to the receivers, the biggest account on this list—$4,817.56 is due from the Commercial Fuel Co., the brokerage concern through which the American company sold its coal, and as this company has no assets that can be found, it is not thought possible to collect the amount.

The large mine of the **Stewart Collieries Co.**, at Summerlee, Fayette County, was completely wrecked by an explosion of undetermined origin recently, damage to the property being estimated at $125,000. The explosion, which shook the hills and broke windows for miles in the vicinity of Summerlee, came within 15 or 20 minutes after about 15 workmen had ceased work for the day. A new tipple recently erected at a cost of $80,000 was completely destroyed as was also a new steel fan, installed at a cost of $35,000.

The Richland Brooke Coal Co., of Wheeling has been organized, there being 1,000 shares of this company without par value. Actively interested in the new company are: A. E. Bryant, Herman L. Arbenz, W. F. Holbert, N. Moran and W. C. Gardner, all of Wheeling.

The Rock Lick Coal Co., recently organized, is making preparations to begin operation on a large scale in the New River field near Concho, the new mine to be opened without delay. Operations will be under the direction of Gilbert Smith, superintendent.

The rope and button conveyor equipment for the **Draper Eagle Coal Co.**, of Logan, is new being manufactured by the Fairmont Mining Machinery Co. This conveyor is to be 600 ft. long, permitting coal to be brought down the hillside to a three-track shaker screen tipple, equipped with loading booms. The company will load coal from the Eagle and Draper seams, the coal being fed to the conveyor at two different points. The equipment will be ready for use by September.

The tipple of the **A. L. Black Coal Co.**, two miles from Morgantown, has been destroyed by fire, the loss being estimated at about $15,000. It is believed the fire was of incendiary origin. The mine was shut down eighteen months ago because of business depression. Recently the property was leased and put in shape to operate just as soon as the strike was settled.

Peter G. Rimmer has resigned his position as district manager of the Ridgway Dynamo & Engine Co., and will be associated with the Scranton Electric Construction Co. Representing the General Electric Co., with his headquarters at Scranton.

Heavy rains about the middle of June washed out a section of track along the Buffalo Creek & Gauley R.R. between Dundon and Widen, preventing shipments of coal from the large plant of the **Elk River Coal & Lumber Co.**, by way of Dundon, where connection is made with the Charleston Division of the Baltimore & Ohio.

R. M. Lambie, Chief of the Department of Mines has announced that eight examinations will be held during the summer months at various points in West Virginia to permit miners to qualify for mine foremen and fire bosses. Each of the examinations will require about two days and will be held on the following dates and at the following places: Mechanical Hall, Morgantown, July 21; School building at Thomas, July 25; Junior High School building at Charleston, July 31; High School building at Beckley, Aug. 3; High School building at Wheeling, Aug. 14; Tower School Building at Clarksburg, Aug. 17; High School building at Welch, Aug. 28; High School building at Logan, Aug. 31.

WISCONSIN

The City of Milwaukee has awarded contracts for soft coal, aggregating 62,500 tons. Several companies refused to submit bids in view of the strike and the uncertain conditions of the coal market. **The Great Lakes Coal & Dock Co.** will furnish 21,000 tons at an average price of $5.90, and 20,000 tons at an average price of $5.75. The price on the first lot involves a long haul. **The Callaway Fuel Co.** furnishes 4,000 tons at $5. The figures are about 25 cents a ton higher than the bids rejected recently because of irregularity.

BRITISH COLUMBIA

George Wilkinson, B. P. E., recently completed a survey of the coal areas of Alberni district, Vancouver Island, for the Provincial Department of Mines. This work was done at the request of the municipality of Port Alberni, officials of which are of the opinion that coal seams on municipal lands may be developed to the profit of the community. It is impossible to say how extensive the Port Alberni coal-bearing lands are without further prospecting. It is possible that this will be undertaken and the result may be the opening up of a new and important area.

A long court dispute over one of the richest mine properties in western Canada has been settled. The battle was for the possession of the **Engineer Mine** at Altin. The estate of Captain James Alexander was victorious.

The twenty-fifth annual report of the **Crow's Nest Pass Coal Co.** was made public at the general meeting of the shareholders, recently held at Fernie. Net profit was $341,938, which after paying income tax for the years 1920 and 1921 was reduced to $89,363. Four quarterly dividends of one and a half per cent each were paid, and this entailed a disbursement of $372,690. During the year the company mined 774,847 tons of coal and manufactured 66,569 tons of coke, as compared with 779,942 tons of coal and 75,928 tons of coke in 1920. The following officers were elected for the ensuing year: W. R. Wilson, president and managing director; H. B. McGivern, first vice-president; W. H. Robinson, second vice-president; J. H. Irvine, secretary; and A. Klauer, treasurer.

NOVA SCOTIA

Work is being resumed at Nos. 24 and 26 collieries of the **Dominion Coal Co.** No. 24 has been idle since last fall and No. 26 is a new colliery. There is a demand for skilled miners at nearly all of the Dominion Coal Co.'s collieries.

Norman Avard has been appointed general manager of the Maritime Coal, Railway and Power Co., of Amherst, to succeed **James Cumberford,** who becomes assistant to the president. Mr. Avard has been connected with the company for fifteen years and for the past year has been assistant general manager.

The Glace Bay miners sentenced to Dorchester Penitentiary for rioting and theft at New Aberdeen some months ago are to be released on condition that they go to work, according to a telegram received from the governor general.

ONTARIO

H. R. Halloway, secretary-treasurer of the F. A. Fish Coal Co., Toronto, leaves early in July on a trip to England in the interests of his company.

The annual report just issued in Toronto by the **Sterling Coal Co.,** states that the profits had been reduced during the current year, although, while the operations of the mines during the year resulted in a loss, owing to prevailing conditions and inventory adjustments, the **Conger Lehigh Coal Co., Ltd.,** a subsidiary, had been in a position to declare a dividend. The latter company showed a small profit which amounted to $6,788, which with the balance brought forward April 1, 1921, of $193,784, makes a total balance carried forward to next year, of $200,572. Net income for the year ending March 31, 1921, was $92,562, which compares with a deficit in the previous year of $32,327. The physical condition of the properties has been well maintained.

WASHINGTON, D. C.

Hold-over cases in the Supreme Court which will come up at the October term include the following affecting coal interests: Secretary of Interior and Choctaw Nation of Indians, vs. the **McAllister Edwards Coal Co.,** from the District of Columbia Court of Appeals; **Wells-Elkhorn Coal Co.,** vs. Otis Steel Co., from the District Court for the Eastern District of Kentucky; **J. M. Macdonald Coal Mining Co.,** vs. the United States, from the Court of Claims; United States, vs. the **New River Collieries Co.,** from the Circuit Court of Appeals, Second Circuit; **O'Gara Coal Co.,** vs. Chicago Title & Trust Co., from the Circuit Court of Appeals, Seventh Circuit.

Canals for coal transportation from Cincinnati to Toledo, connecting with Lake Michigan, from Portsmouth to Sandusky and from Pittsburgh to Lake Erie, were advocated before the Senate Appropriations Committee by former Congressman Welty of Ohio. "The government improved the Ohio rivers and tributaries so that barges could be loaded from coal mines to take coal north," said Mr. Welty. "While the rivers in Kentucky and West Virginia are canalized and load barges at the mines, the coal is dumped on the north bank of the Ohio River and loaded on cars, then taken across Ohio, and transferred to boats for the Northwest. Coal is delivered at Toledo for water shipment for 83c. less freight from Cincinnati than to Lima, although it is 75 miles farther."

Traffic News

The West Side Fuel Co., has withdrawn its complaint from the I. C. C. which alleged unreasonable demurrage charges on coal assessed at Lansing, Mich.

The McKinney Steel Co., has withdrawn its complaint involving rates on coke from Fairmont, W. Va., to Josephine, Pa.

The National Retail Coal Merchants' Association has filed exceptions to the examiners report in its case, contending that the railroads have not justified present practices, and requesting the commission to establish proper rules and regulations governing weighing and reweighing, tolerance and correction of charges, and disposition of claims in connection with coal shipments.

The Interstate Commerce Commission has authorized a refund of $8,444 to the **Seaboard By-Product Coke Co.,** for unreasonable rates charged on bituminous coal shipped from Pennsylvania and other mines to Seaboard, N. J., as reconsigned from Elizabethport and Port Reading, N. J., coal piers.

Oral argument of the complaint of the **Clay County Coal Operators' Association** before the I. C. C. at Washington has been advanced from Sept. 14 to July 13.

In a complaint the **Dixie Portland Cement Co.,** of Chattanooga alleges unreasonable rates on slack, run of mine and nut and slack from mines in the Bon Air Tracy City groups and points in Alabama via Bridgeport, Ala., to Richard City, Tenn.

Defending the rates complained of by the **Big Mandy Coal & Mining Co.,** the Chesapeake & Ohio contends that the rates on coal from the complainant's mines on the Lenox R.R. in Morgan County, Ky., to points in C. F. A. territory, including Cincinnati, are not discriminatory.

Further hearings were held recently by the Public Service Commission of West Virginia about the middle of June as to the reasonableness of freight rates within the state, and more particularly as to the rates on coal and coke. William Morris, of Wheeling, traffic manager of the Weirton Steel Co., was among the witnesses and declared the present rates to be exorbitant. Representatives of other concerns also testified as to the effect of the present intrastate rates on coal and coke.

Refusal by railway officials to include rates on short coal hauls in the Indiana territory in the 10 per cent reduction recommended by the I. C. C. was scored in a resolution adopted by the **Terre Haute, Ind., chamber of commerce** recently. The action was taken on the ground that the failure to lower coal freight rates on the short hauls from mines in that section to the industries and private consumers in that city, while reducing the rates on coal from the same mines to industries in Chicago and other points which are industrial competitors, is unfair in that it robs Terre Haute of this natural advantage of proximity to fuel sources.

Col. E. F. Goltra, of St. Louis, has announced his intention of operating a line of barges this season on the Mississippi river between Minneapolis and St. Louis, carrying coal north and iron ore south. This project has been under consideration for many months.

The Interstate Commerce Commission has suspended until Oct. 12 proposed reductions on slack coal from the Southwest to Omaha and related points.

In a complaint to the I. C. C. the **Globe Iron Co.,** alleges unreasonable rates on coal from its mine to its iron furnace in Jackson, Ohio.

The ninth annual convention of the **Southwest Interstate Coal Operators' Association,** held in Kansas City, Mo., June 15, drew an extra large attendance. Ira Clemens, who has been president for two successive terms, declined re-election and H. N. Taylor was chosen his successor. All of the other officers and the executive committee were unanimously re-elected.

The Salt Lake City Commercial Club has requested that the I. C. C. permit the D. & R. W. R.R. and the Utah R.R. to publish, on one-day notice, reduced coal rates from the Utah fields to northern California. It is claimed that the 15 days' notice already in force is not satisfactory.

The Utah railroads have asked the I. C. C. for permission to reduce their rates for intrastate traffic so that they may correspond with the reductions for interstate shipments.

The Lion Coal Co., of Ogden, Utah, has filed a brief with the Public Utilities Commission against the O. S. L. R.R. for recovery of charges alleged to be paid on coal switched from Ogden to the sugar factory four miles from the city. The brief figures the car mile rate on coal from the mines to Ogden at 52.3c. and on the four-mile switch as $7.50, as against the rate of 60c. a ton, charged a short time some years ago.

Association Activities

Pennsylvania Retail Coal Merchants' Association

The eighteenth annual conference of the association was held in Trenton, June 7 and 8. Delegates and invited guests were entertained by the Philadelphia & Reading Coal & Iron Co. at the concluding dinner. Business sessions, under President Samuel B. Crowell, were held in the armory.

The official list of speakers included F. W. Donnelly, mayor of Trenton; Roderick S. Stephens, former president of the National Retail Coal Merchants' Association; Charles N. Dorrance and D. F. Williams, vice-presidents of The Hudson Coal Co.; J. B. Warriner, general manager, Lehigh Coal & Navigation Co.; W. L. Dill, New Jersey motor vehicle commissioner; J. P. Bird, Jersey City; E. I. Edwards, Governor of New Jersey, and W. N. Runyon, former Governor; J. W. Mason and J. W. Lloyd, of Philadelphia; Senator Miles Poindexter, of Washington; J. D. A. Morrow, vice-president of the National Coal Association; and W. B. Smith, line sales agent, P. & R. C. & I. Co.

Obituary

Edward J. Hackett, New Albany, Ind., prominent in the coal business there, died recently at his home. He was president of the Edward J. Hackett Coal Co., of New Albany and Louisville, Ky. He also was president of the Louisville Frog & Switch Point Co. Mr. Hackett always had taken an active part in civic affairs.

James Stuart Race, formerly sales manager for the Central Fuel Co., and later connected with the Bewley Darst office in Cincinnati died at the General Hospital in that city on June 11. The funeral was held from the home of B. Lee Hutchinson, Western representative of the Hutchinson Coal Co.

Coming Meetings

National Safety Council. Eleventh annual Safety Congress at Detroit, Mich., Aug. 28 to Sept. 1. Executive secretary, W. H. Cameron, North Michigan Ave, Chicago, Ill.

Coal Mining Institute of America will meet Dec. 13, 14 and 15 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 911 Chamber of Commerce Bldg., Pittsburgh, Pa.

American Society for Testing Materials is holding its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

Mine Inspectors' Institute of the United States of America will hold its annual meeting July 11, 12 and 13 at Chicago, Ill. Secretary, J. W. Paul, 4800 Forbes St., Pittsburgh, Pa. Headquarters Hotel Sherman, Chicago, Ill.

Coal and Industrial Exposition under the auspices of the Huntington Chamber of Commerce will be held Sept. 18-23 in the Chamber of Commerce Bldg., Huntington, W. Va. **The West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers** will again hold its annual meeting in the same building during the exposition.

National Exposition of Chemical Industries will hold its eighth national exposition at the Grand Central Palace, New York City, Sept. 11-16. Manager, Charles F. Roth, Grand Central Palace, New York City.

The annual convention of the **American Mining Congress** will be held in Cleveland, Ohio, Oct. 9 to 14.